# Report on deployment of technical support and consultancy – Second Round (M36)

## Deliverable 3.6

## WP3. Supporting hands-on promising women-led projects for renewable energy heating and cooling

**Project title**

W4RES - Scaling-up the involvement of women in supporting and accelerating market uptake of renewable energy sources for heating and cooling

**Grant agreement: 952874**

From November 2020 to October 2023

**Prepared by: HFT**

31/10/2023 (M36)

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# DELIVERABLE FACTSHEET

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| **Deliverable no.** | Deliverable 3.6 |
| **Responsible Partner** | HFT – Hochschule für Technik Stuttgart |
| **WP no. and title** | 3. Supporting hands-on promising women-led projects for renewable energy heating and cooling |
| **Task no. and title** | 3.2. Delivery of technical support and consultancy to help women set-up and deploy gender-responsive RHC solutions |
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| **Dissemination level** | |
|---|---|
| X | PU = Public |
| | PP = Restricted to other programme participants (including the EC) |
| | RE = Restricted to a group specified by the consortium (including the EC) |
| | CO = Confidential, only for members of the consortium (including the EC) |

**Document history**

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# ABBREVIATIONS

| | |
|---|---|
| **BE** | Belgium |
| **BG** | Bulgaria |
| **CHP** | Combined Heat Power |
| **D** | Deliverable |
| **DE** | Germany |
| **DK** | Denmark |
| **EIC** | European Innovation Council |
| **EI** | Environmental impact |
| **EU** | European Union |
| **GHG** | Greenhouse gas |
| **GR** | Greece |
| **HTC** | Hydrothermal carbonization |
| **IT** | Italy |
| **KPIs** | Key Performance Indicators |
| **LAP** | Low Emissions Analysis Platform |
| **M** | Month |
| **NIP** | Needs Identification Process |
| **NO** | Norway |
| **RES** | Renewable Energy Sources |
| **RHC** | Renewable Heating and Cooling |
| **SAP** | Service Action Plan |
| **SAT** | Self-Assessment Tool |
| **SK** | Slovakia |
| **SME** | Small Medium Enterprise |
| **STEM** | Science Technology Engineering Mathematics |
| **T** | Task |
| **TED** | Technology and Environment Database |
| **W4RES** | Women for market uptake of renewable heating and cooling |

# PARTNERS SHORT NAMES

| | |
|---|---|
| Q-PLAN | Q-PLAN INTERNATIONAL ADVISORS PC |
| APRE | AGENZIA PER LA PROMOZIONE DELLA RICERCA EUROPEA |
| CIVI | CIVIESCO SRL |
| S2i | STEINBEIS 2I GMBH |
| WECF | WOMEN ENGAGE FOR A COMMON FUTURE EV |
| HFT | HOCHSCHULE FUR TECHNIK STUTTGART |
| EUREC | EUREC EESV |
| WR | WHITE RESEARCH SPRL |
| PEDAL | PEDAL CONSULTING SRO |
| EAP | ENERGY AGENCY OF PLOVDIV ASSOCIATION |
| EGC | EUROPEAN GREEN CITIES APS |
| ECWT | EUROPEAN CENTRE FOR WOMEN AND TECHNOLOGY, FORENING |

# EXECUTIVE SUMMARY


The W4RES project aims to enhance women involvement in the adoption and utilization of renewable heating and cooling (RHC) systems. To achieve this, the W4RES consortium provides proven, replicable measures of support, tested and validated in eight European countries: Greece, Italy, Germany, Belgium, Denmark, Slovakia, Norway, and Bulgaria.

This report, **Deliverable 3.6**, presents a detailed account of the second round of technical support and consultancy services provided during a six-month period in the context of Task 3.2, led by HFT. Within W4RES, Task 3.2 focuses on providing technical support services and consultancy to women who aim to set up and deploy gender-responsive RHC solutions. This is a key focus for achieving the project's objectives, together with Task 3.3, "Providing business and innovation support services to facilitate and accelerate RHC market uptake". The deployment of business and innovation support services will be presented in **Deliverable 3.7**, while **t**he reports for first round of support services are given in Deliverable 3.2 (technical) and Deliverable 3.3 (business and innovation).

Throughout the six-month period, technical support services were provided to eleven women-led projects in Bulgaria, Germany, Greece, Italy, and Slovakia. In Bulgaria, a project was supported that developed scenarios for the national-level heating and cooling sector. Another Bulgarian project focused on assessing technologies for producing solid biofuels from organic waste. The third project from Bulgaria aimed to explore the photovoltaic potential of the National Trade and Banking High School in Sofia. In Germany, four municipalities applied to gain insights into the energy and $CO_2$ savings potential of building-related measures such as refurbishment, photovoltaic potential, and other possible renewable energy sources for the supply of their region. In Italy, a start-up in the photovoltaic sector received support for their foldable PV panel by calculating the adapted $CO_2$ footprint after sourcing from local suppliers to shorten supply chains, resulting in $CO_2$ savings. Additionally, an Excel-based Use Case Builder was developed to estimate the $CO_2$ savings of the PV panel for different use cases. The project in Slovakia focused on the implementation of a district heating system based on a geothermal and solar thermal plant in a pre-feasibility study, and liaised with other experts in the field.

This report includes an update on the targets as outlined in Deliverable 2.7, focusing on the impact and progress of each supported project and how may stakeholders were reached. To sum it up, W4RES has successfully achieved its objectives of considering the minimum number of diverse renewable energies (RES) and associated technologies. Additionally, the report outlines the methodology used to evaluate the overall *KPI-7: environmental impact*, and its successful target achievement.

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# 1 INTRODUCTION

The W4RES project aims to enhance the involvement of women in the acceptance and usage of renewable heating and cooling (RHC) solutions. To achieve this objective, the W4RES consortium provides tested and proven support measures that can be replicated across eight European countries: Greece, Italy, Germany, Belgium, Denmark, Slovakia, Norway, and Bulgaria. Each of these countries represent a Regional Hub in which a consortium partner acts as the Regional Hub Manager. The fundamental project concept acknowledges women as promising agents of change, driving the energy transition and facilitating prompt progress towards the EU's 2030 climate and energy objectives.[1]

The prevailing framework conditions and regional peculiarities in eight local RHC markets across Europe (**Deliverable 1.2**) necessitate a flexible and personalised approach to support the adoption and promotion of RHC solutions that go beyond one-size-fits-all approaches by increasing the participation of women.

Therefore, the consortium partners have compiled a wide range of support measures. **Deliverable 2.3** outlines all support measures provided by the consortium. It lists and describes 18 technical support services among them. These support services were announced in two calls, one in the summer of 2021 and another in the summer of 2022, giving municipalities, companies, start-ups, etc., the opportunity to submit their proposals in the field of RHC solutions. The applications received were evaluated and selected with a consistent methodology for the first and the second round of support services.

This report describes the deployment of technical support services with a focus on the second round and is split into four main sections. **Section 2** presents a summary of the activities that took place during the provision of technical assistance services in the second round. In the first step, the technical service portfolio is presented and secondly, the methodology of identifying the needs of the applicants is explained. Thirdly, an overview of the identified needs of the applicants is given. These needs have been assigned to a service from the portfolio as well as to a consortium partner providing these technical support services. **Section 3** provides a detailed description of each technical support service provided. It presents each supported project in a set-card format and elaborates on the activities and results. In **Section 4** , the targets and their degree of achievement for the deployment of technical services are addressed and in **Section 5** a conclusion is given and the results from this Deliverable are summarised.

The projects supported during the first round are described in detail in **Deliverable 3.2**.

[1] (https://ec.europa.eu/clima/eu-action/european-green-deal/2030-climate-target-plan_de, accessed on 15.08.2023)

# 2 ACTIVITIES PERFORMED WITH REGARDS TO TECHNICAL SUPPORT SERVICES

This section elaborates in **Subsection 2.1** on the portfolio of technical support services and in **Subsection 2.2** on the Needs Assessment process. These two aspects are required to perform the matching process between the applicants and the services providers.

## 2.1 Portfolio of technical support services

Prior to the second round of support services for proposals of women-led projects in the RHC sector, the Service Catalogue, introduced in Deliverable 3.2 and Deliverable 3.3, with possible support services of each consortium partner was updated. After the first round of support services each consortium partner received guidance to revise the Service Catalogue provided by the consortium partner S2i according to their capabilities and expertise in providing support services. For the second round of services a sum of 69 services were identified.

This Service Catalogue is divided into two sections: business and innovation support services and technical support services. This report covers the technical support services included in the second round of support services. The business and innovation support services for the second round are presented in **Deliverable 3.7** by the consortium partner S2i, due in October 2023.

A total of 20 technical support services and 49 business and innovation support services were identified and offered. Four consortium partners (CIVI, EAP, EGC, and HFT) provided these 20 technical support services across five thematic categories for the second round of support services:

- B.1 Building and City Quarter Simulation
- B.2 Environmental Impact Assessment
- B.3 Monitoring
- B.4 Strategic Assessment
- B.5 Certification

**Figure 1** displays an overview of the project consortium partners offering technical support services, grouped according to the five thematic categories. More detailed information on each technical support service is listed in **Annex 6.1**. Technical services provided by EGC were not included in the second round of projects because EGC utilized its available hourly quota for supportive services during the first round. Hence, the support services provided by EGC have been highlighted in grey in **Figure 1**.

| Type of service / Project partner | B.1 Building and City Quarter Simulation | B.2 Environmental Impact Assessment | B.3 Monitoring | B.4 Strategic Assessment | B.5 Certification |
|---|---|---|---|---|---|
| CIVI | | | Monitoring<br>Advice for pilot project implementation<br>Energy audit and performance certifications | | |
| EAP | Energy performance auditing, certification & consultancy in RES<br>Technical feasibility studies<br>Thermal imaging via drone for public and private buildings | | KPI indicated energy and environmental monitoring | | |
| EGC | Support in the initial phase of the transformation into a “green city”<br>Support for energy communities<br>Support for environmental renewal concepts | | Monitor "green cities" (UN 17 SDGs) | Knowledge sharing in establishment of green cities | Energy certification through cooperation partner in Denmark<br>Research and pre-paration for Danish sustainability certificate: Svanemærket. |
| HFT | Demand and supply simulation<br>Renewable energy potential assessment | Impact assessment of energetic design choices<br>Life cycle assessment of buildings and city quarters | | Assessment of sector coupling effects | Technical training / "Micro Credits" |

*Figure 1: Overview of partners offering technical support services clustered according to the five thematic categories in the second round of support services*

## 2.2 Needs Identification Process (NIP)

The **Needs Identification Process (NIP)** was adapted and optimized during the second round of support services. During the first round of support services the NIP consisted of two steps:

- Self-Assessment Tool (SAT)
- First meeting with the Hub Manager

During the second round of support projects the SAT (see Deliverable 3.2) was not sent to the applicants due to the feedback that this tool was too complicated and too long. Instead of the SAT, an evaluation of each application by every consortium partner took place. All projects of the second round with their identified needs are fully detailed in **Annex 6.2**.

All submitted applications were assessed with a consistent methodology which lead to the conclusion that all submitted projects were suitable for being supported by the W4RES consortium and were subsequently accepted.

Following this, the Hub Managers met with the project applicants in their respective Hubs to conduct a thorough needs assessment. The agenda of this meeting is seen in **Figure 2.**

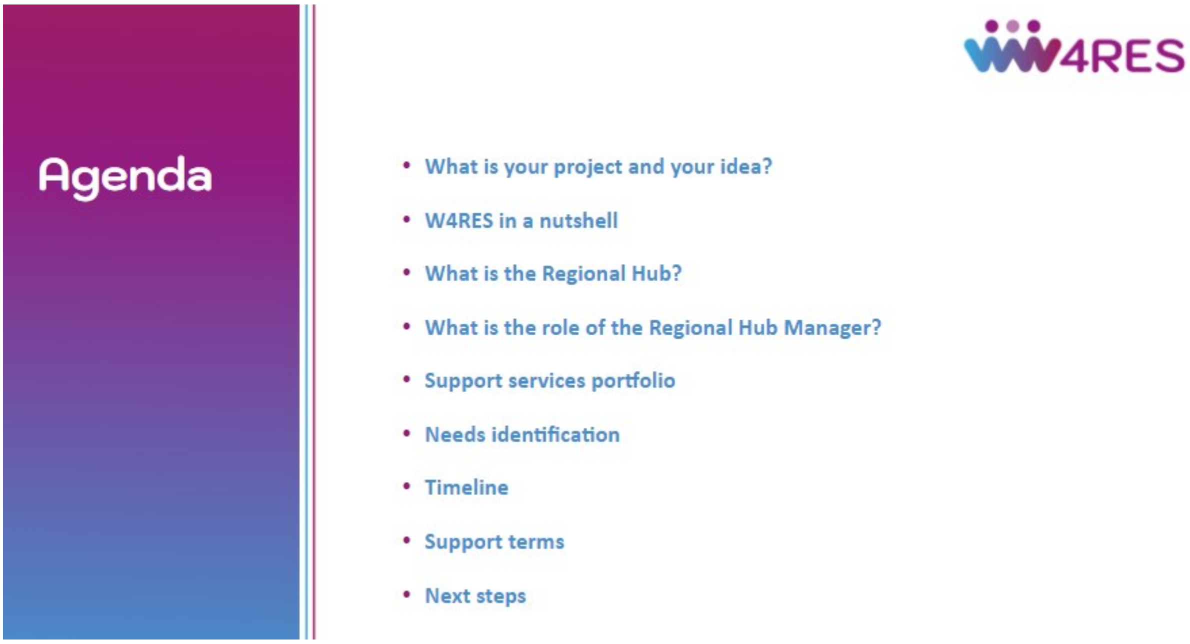



*Figure 2: Agenda of the first Hub Manager meeting.*

The responsible Hub Manager briefed the awardee about the service portfolio. The awardees were also informed about the rules, terms and conditions of receiving the support service and the highlight that they can receive only one individual support service. After the awardee introduction, Hub Manager worked out with the awardee to find out their needs. All Hub Managers had access to the shared Service Catalogue with 69 services, so they were able to discuss needs and to propose potential services during the meeting. The awardees were asked to prioritise three needs that they expected to be most helpful. Out of the prioritised needs, the awardees would receive only one service in the delivery of services phase. The awardees were then notified about the next steps.

This process was also conducted during the first round of support services and has been retained due to its effective facilitation of fast, direct, and easy information exchange. As in the first round of support services, the results of this direct needs assessment were documented in the Service Action Plan (SAP). During a meeting with the project coordinator and the Work Package (WP) 3 responsible consortium partners (S2i and HFT), the projects were matched to consortium partners that could provide the specific service required using the updated Service Catalogue (see **Subsection 2.1**).

Once matched, the consortium partners were instructed to arrange an initial meeting with the awardee to align and agree on the needs addressed. This step was taken to identify discrepancies promptly and to inform the awardees about the service they can anticipate. If no discrepancies arose, the applicant and consortium partner were successfully matched. If any discrepancies arose, a meeting would be held involving the applicant, the Hub Manager, and any other consortium partners who could address the applicant's needs. In all cases, suitable solutions were found.

A total of 13 projects requiring technical support services were scouted and matched during the second round of support services. The projects have been allocated to the most appropriate consortium partner based on their needs. They are not evenly distributed among the Regional Hubs, but rather in a way that best meets their needs. In Germany (DE) four projects with a need for technical support services were acquired, in Bulgaria (BG) three, in Italy (IT) two and in Greece (GR) and Slovakia (SK) one each. No projects requiring technical support were scouted in the Regional Hubs of Belgium (BE), Denmark (DK) and Norway (NO). **Figure 3** illustrates the distribution of technically supported projects during the second round of support projects.

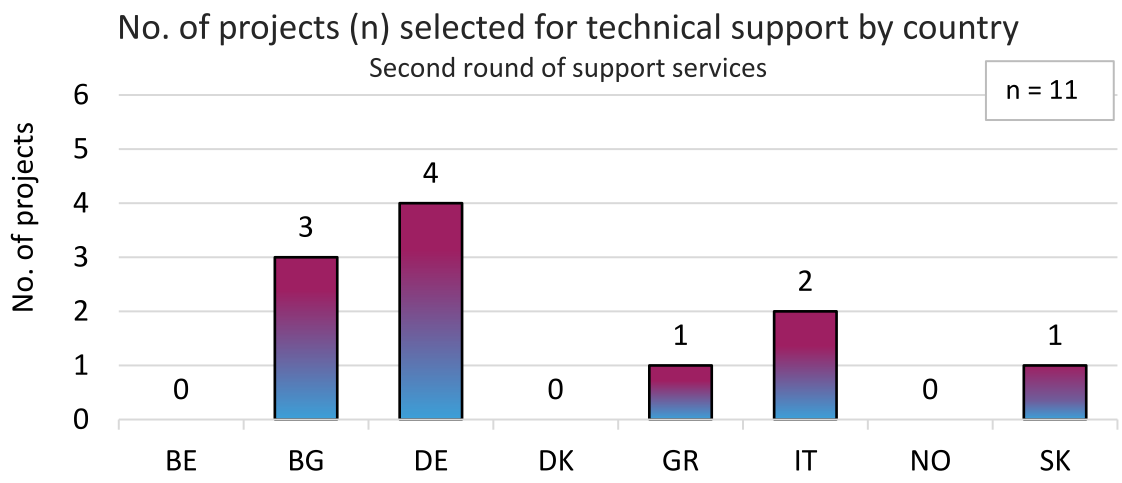



*Figure 3: Number of projects acquired for technical support services per country - second round of support services.*

Over the course of both rounds, 21 projects have been acquired for receiving technical support services. Three of these services (one in the first round and two in the second round) decided to withdraw either before the service began or as their time management prohibited to sharing of necessary information over the course of the service. Therefore, in total 18 projects remained receiving a complete service. **Figure 4** displays the technically supported projects summarized for the first and second round of calls. Five projects were supported in Germany (DE), four in Slovakia (SK), three each in Bulgaria (BG) and Italy (IT), two in Denmark (DK) and one in Greece (GR). In the regional centers of Belgium (BE) and Norway (NO), technical services were not provided to any projects as there were no applications requesting such services in either country.

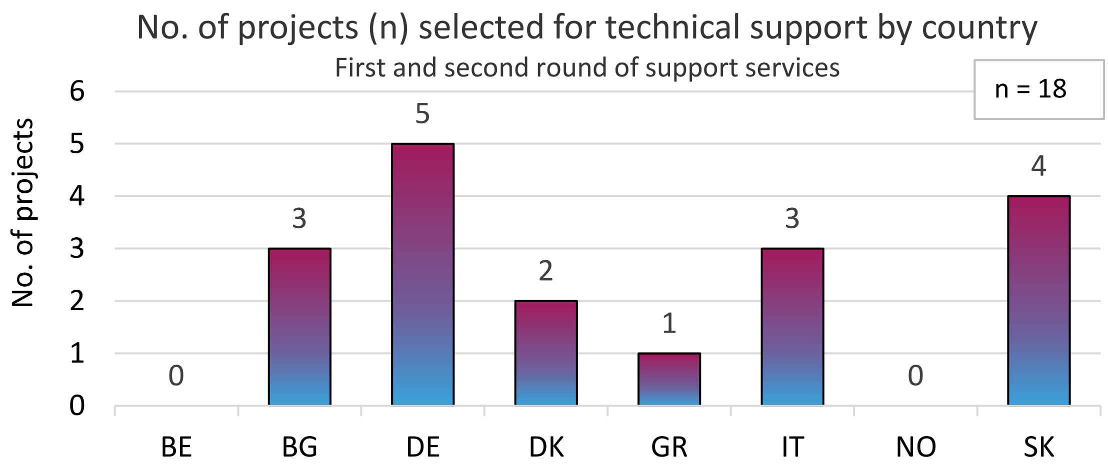



*Figure 4: Number of projects acquired for technical support by country- first and second round of support services.*

Upon examining **Figure 4**, it was observed that no applications for technical services were submitted in Belgium and Norway during both rounds. This may be due to the fact that there are no technical service partners within the consortium in these regions, which could mean that the contacts and promotion of the calls for projects were more focused on business and innovation projects. In Bulgaria, Germany and Italy, however, a greater number of technical projects were submitted. The technical service providers CIVI, EAP and HFT are located in these regions.

From the three consortium partners providing technical services during the second round of support services (CIVI, EAP and HFT), most applications were matched to services in the first category *B.1 Building and City Quarter Simulation.* No applications were submitted for the categories *B.4 Strategic Assessment* and *B.5 Certification*. **Figure 5** shows all eleven projects that applied for a technical service during the second round of support services. The applications are sorted by thematic category and by the assigned service provider.

| Type of service / Project partner | B.1 Building and City Quarter Simulation | B.2 Environmental Impact Assessment | B.3 Monitoring | B.4 Strategic Assessment | B.5 Certification |
|---|---|---|---|---|---|
| CIVI | | | (IT) Green Duct | | |
| EAP | (BG) Scenarios development for heating and cooling sector in the context of decarbonization | | (BG) Technologies for production of solid biofuels from organic waste | | |
| EGC | EGC exceeded their technical support hours in the first round of support services and was therefore not selected to provide a support service in the second round. | | | | |
| HFT | (BG) Building photovoltaic park on the roof of the National Trade and Banking High School in Sofia<br>(DE) Networking and cooperation of settlements (2)*<br>(DE) Energetic inventory and potentials of municipal properties of the city of Oestrich-Winkel<br>(DE) Simulation of RE potentials in private households and municipal properties in Oststeinbek*<br>(DE) Speed-up energy transition Korbach (SET-Korbach)<br>(GR) RESUB – RES for urban buildings | (IT) Levante (2)<br>(SK) Planning and capacity building for a successful heat supply transformation | | | |

*shorted project name in order to the keep the graph readable

*Figure 5: Overview of applications received and their matching to the technical support services, sorted by thematic section and assigned service provider*

To compare the technical services given during the first and second round **Figure 6** presents a summary of the projects that have been supported in both service rounds, categorized by partner and type of service. During the first round of support services out of seven supported projects, five received the service *B.1 Building and City Quarter Simulation* and two supported projects received the service *B.2 Environmental Impact Assessment*. The second round of support projects revealed a similar pattern. Out of eleven supported projects, seven projects received the service *B.1 Building and City Quarter Simulation*. Additionally, two projects received the service *B.2 Environmental Impact Assessment* services and two projects received the service *B.3 Monitoring*.

In both rounds, 14 out of the 18 projects were supported in the service type *B1*, indicating significant interest in this service type. By contrast, there were no applications for the service types *B.4 Strategic Assessment* and *B.5 Certification* in both rounds, suggesting that these types of services were of low interest to the addressed target group in the RHC sector.

| Project partner / Type of service | B.1 Building and City Quarter Simulation | B.2 Environmental Impact Assessment | B.3 Monitoring | B.4 Strategic Assess-ment | B.5 Certifi-cation |
|---|---|---|---|---|---|
| CIVI | | | IT - second round | | |
| EAP | SK - first round<br>BG - second round | | BG - second round | | |
| EGC | DK - first round<br>DK - first round | | | | |
| HFT | DE - first round<br>SK - first round<br>BG - second round<br>DE - second round<br>DE - second round<br>DE - second round<br>DE - second round<br>GR - second round | SK - first round<br>IT - first round<br>IT - second round<br>SK - second round | | | |

*Figure 6: Technically supported projects during the first and second round of support services, sorted by consortium partners and service type.*

The eleven projects supported during the second round are described in more detail in the following **Section 3**. Each project will be presented with a set card, indicating relevant framework information, i.e. a short description, the support service type, project location and duration as well as an indication of the consortium partner who provided the service and was the main contact person throughout the processing time. Afterwards the activities and results of the projects are described in more detail.

# 3 DEPLOYMENT OF TECHNICAL SUPPORT SERVICES

## 3.1 Technical projects in Bulgaria

| **Project title** | **Scenarios development for heating and cooling sector in the context of decarbonisation** |
|---|---|
| **Project description** | The project examines two scenarios and a sensitivity analysis to determine the transition pathways on national level of the heating and cooling subsector. The first scenario considers commitments regarding energy and emissions until 2030, which is based on the WAM (with additional measures) scenario of the Integrated Energy and Climate Plan. The second scenario considers the ambitious commitments up to 2050, which is based on four European Commission studies addressing the different aspects of decarbonization of heating and cooling in the EU through different legal instruments, in particular the Renewable Energy Directive.<br><br>These studies include a comprehensive assessment of energy-environment-economy systems using the Low Emissions Analysis Platform (LEAP) model's Technology and Environment Database (TED), which describes the technical characteristics, costs and environmental impacts of a range of energy technologies, including existing technologies, current best practices as well as next-generation devices. The results will be made available to state and local governments to support the formulation of national and regional development strategies, as well as to large energy companies and public organizations. |
| **Support service type** | B.1 Building and City Quarter Simulation – Technical feasibility studies for EE and/or RES technologies |
| **Regional Hub** | Bulgaria |
| **Duration of project** | Feb – Jun 23 |
| **W4RES service partner** | EAP |
| **Contact persons** | Kristina Hadjiiska (she/her) |
| **Type of organisation** | Institute for nuclear research and nuclear energy |

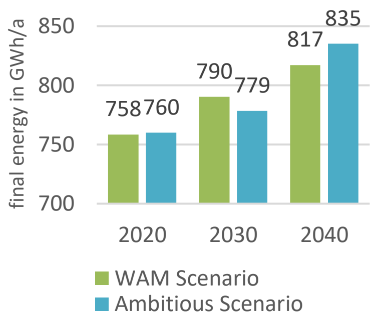



*Figure 7: Final energy consumption of RES in the heating and cooling sector for 2020 – 2040, GWh*

| | |
|---|---|
| **Activities and results achieved through the services** | Support for the project focused on sharing expertise and experience in energy modelling, particularly in the heating and cooling subsectors. Under the grant program, the awardee received support in finding energy data for the sector, building a database for the modelling tool and running through different aspects and functions of the modelling to create different scenarios. For example, the awardee ran several different scenarios for the future development of the heating and cooling sector. In addition, the mentor has shared his experience in local energy planning and explained how to create energy forecasts and projections for the purposes of SEAP/SECAP development. The results of the mentorship will be used in doctoral dissertations and EAP will assist the awardee in forwarding them as policy recommendations to national authorities. |

| Project title | Technologies for production of solid biofuels from organic waste | |
|---|---|---|
| Project description | Energy from solid biofuels (bioenergy) can be obtained by a variety of thermochemical processes, depending on feedstock, availability and quantity, the form of energy to be obtained, the desired end product as well as economic constraints. The subject of this project is the application of processes such as hydrothermal carbonization (HTC), pyrolysis, burning, briquetting, and palletisation to convert various types of biomass into solid biofuels.<br>After a thermal or densification process, biomass conversion products offer better energy properties compared to raw biomass, such as higher heating value, lower moisture content, and more stable texture. Solid biofuels are a clean, renewable energy alternative for reducing $CO_2$ emissions and have an overall lower environmental impact than fossil fuels, allowing energy needs to be met by locally renewable energy. | |
| Support service type | B.3 Monitoring – KPI indicated energy and environmental monitoring | |
| Regional Hub | Bulgaria | No picture |
| Duration of project | Feb – Jun 23 | |
| W4RES service partner | EAP | |
| Contact persons | Vanya Markova (she/her) | |
| Type of organisation | University | |
| | | |
| Activities and results achieved through the services | EAP and the awardee exchanged views on potential solid biofuel combustion technologies, explaining their market prospects and their impact on local communities and the environment. The exchange focused on how solid biofuel energy use can impact forestry and the energy and emissions balances of communities where such technologies are deployed. The awardee, with mentor support, prepared a comparative study of biomass use and its alternative energy sources. A pilot community that heats primarily with firewood was evaluated against various sustainability scenarios for the heating sector. The assessment replaced the use of firewood with other biomass-based products and the corresponding combustion technologies. The results of the study will be incorporated into the pilot community's local planning document. | |

| **Project title** | **Building Photovoltaic Park on the roof of the National Trade and Banking High School – Sofia Bulgaria** |
|---|---|
| **Project description** | The National Trade and Banking School in Sofia has great potential to generate climate-neutral electricity with photovoltaic (PV) systems on its roofs. A student of this school recognized this potential. She is committed to climate protection and sustainable energy, which is why she applied for the W4RES Support Service. Together with W4RES experts, the awardee wants to prepare a report on the specific PV potential for her school, considering both the technical and economic feasibility of PV installations. Her goal is to have her school actively participate in the energy transition and climate protection, and thus serve as a good example for other follow-up projects. Likewise, it is about sharing expertise and knowledge about energy building simulations and PV potentials in particular. |
| **Support service type** | B.1 Building and City Quarter Simulation - Renewable Energy Potential Assessment |
| **Regional Hub** | Bulgaria |
| **Duration of project** | Jan – May 23 |
| **W4RES service partner** | HFT |
| **Contact persons** | Lora Kirilovaa (she/her) |
| **Type of organisation** | High School Student |

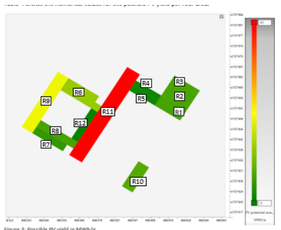



*Figure 3: Possible PV yield in MWh/a*

*Table 3: Possible PV yield in MWh/a*

| Roof Surface | Possible PV yield | Roof Surface | Possible PV yield |
|---|---|---|---|
| [-] | MWh/a | [-] | MWh/a |
| **R1** | 12,9 | **R7** | 10,4 |
| **R2** | 13,0 | **R8** | 12,9 |
| **R3** | 13,1 | **R9** | 31,4 |
| **R4** | 6,5 | **R10** | 14,4 |
| **R5** | 6,5 | **R11** | 61,4 |
| **R6** | 21,8 | **R12** | 5,8 |

*Figure 8: Excerpt of PV report for NTBHS*

**Activities and results achieved through the services**

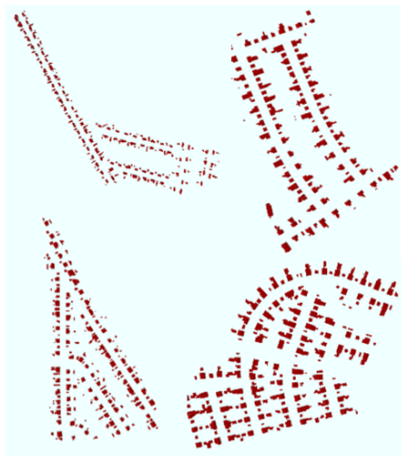
As a first step HFT created a 3D building model of the High School based on pictures and 2D-plans obtained by the awardee. Based on this, HFT used its simulation platform SimStadt for estimating the technical and economic PV potential. All parameters were adapted to the conditions of Bulgaria.

The following documents/ information were handed over:

- Excel sheet with detailed simulation results for each roof;
- Result pictures (bird´s eye view) of different parameters;
- Summary report (six pages) with all information, pictures and estimated $CO_2$-savings.

Through all the steps, the awardee gained insights into all work steps and received a virtual tour of the simulation platform was given.

## 3.2 Technical projects in Germany

| **Project title** | **Networking and cooperation of settlements by improving and linking buildings as well as introducing intelligent supply mains and renewable energies** | |
|---|---|---|
| **Project description** | The Association Verband Wohneigentum Brandenburg-Berlin e. V. wants to support its members with a comprehensive energy analysis for their residential buildings. In this way, the association wants to ensure that citizens are informed about their individual energy potential and the corresponding costs. The energy analyses are planned in four settlements using 3D building data models and a simulation platform from HFT. The settlements contain between 120 and 370 buildings. Most buildings in the settlements were built in the 1930s or 50s, are not refurbished, and have an oil or inefficient electricity heating system. The goal is to activate homeowners with the building-specific energy analysis to contribute to a climate-neutral building stock. | |
| **Support service type** | B.1 Building and City Quarter Simulation - Demand and Supply Simulation | |
| **Regional Hub** | Germany |  *Figure 9: Bird's eye view of buildings in the four settlements* |
| **Duration of project** | Dec 22 – May 23 | |
| **W4RES service partner** | HFT | |
| **Contact persons** | Melissa Krüger (she/her)<br>Katharina Gapp-Schmeling (she/her) | |
| **Type of organisation** | Verband Haus- und Wohneigentum Siedlerbund Berlin-Brandenburg e.V. | |
| | | |
| **Activities and results achieved through the services** | The four Berlin settlements were analysed in regards to energy using the simulation platform SimStadt. Before the analysis, meetings with each settlement management board were held in order to inform them about the process and what kind of analysis they can expect. Board members were also able to select three different refurbishment and energy supply scenarios to examine in more detail. | |

| | |
|---|---|
| | As a first step, the 3D building models for each settlement were acquired and edited in several pre-processing steps to enrich the models with data. Depending on the selected scenarios, the simulated results were supplemented with cost estimations.<br>The obtained data was then presented for each building over a digital interface. These energy fact sheets were presented by the board members, the association or the W4RES service provider in a settlement assembly in each settlement.<br><br>The following documents and information were handed over:<br><br>• Provision of building-specific fact sheets for each settlement containing information about the energetic status-quo of the buildings as well as refurbishment scenarios and PV potential as online application;<br><br>• Renewable Energy Source (RES) supply scenarios including an estimate of the economic expense;<br><br>• Summary of results as editable excel tool and as presentation for each of the three settlements. |

<table>
<tr><th>Project title</th><th colspan="2">Energetic inventory and potentials of municipal properties of the city of Oestrich-Winkel</th></tr>
<tr><td>Project description</td><td colspan="2">Oestrich-Winkel is a small town in the west of Germany with a population of around 12,000 in a rural wine-growing area. As a small community, Oestrich-Winkel has limited financial and human resources to initiate new projects and try out new technologies. Nevertheless, the municipality has already developed a climate protection concept and created an internal position for climate protection management.<br>Oestrich-Winkel intends to use W4RES service to carry out more in-depth analyses of its building stock, especially public buildings. The municipality's climate goals can be achieved through detailed recording and the possible derivation of measures for a more climate-friendly management of the properties.</td></tr>
<tr><td>Support service type</td><td colspan="2">B.1 Building and City Quarter Simulation - Renewable Energy Potential Assessment</td></tr>
<tr><td>Regional Hub</td><td>Germany</td><td rowspan="6"><br>Figure 10: Indicating financial feasibility of PC systems for the city of Winkel</td></tr>
<tr><td>Duration of project</td><td>Jan – Jun 23</td></tr>
<tr><td>W4RES service partner</td><td>HFT</td></tr>
<tr><td>Contact persons</td><td>Jennifer Höltge (she/her)</td></tr>
<tr><td>Type of organisation</td><td>Municipality Oestrich-Winkel in Germany</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Activities and results achieved through the services</td><td colspan="2">At the start of the project, it was agreed with the city of Oestrich-Winkel which buildings would be analysed and which energy analyses should be carried out. 3D city models are needed to analyse the heat demand, various refurbishment scenarios and the PV potential of all the buildings' roofs, which are used as input for the simulation platform. This data could be obtained free of charge from the relevant national authority. The other input data on the years of construction of the buildings was obtained from the municipality's urban development plans.<br><br>With the help of the simulation, the energy potential of the private residential buildings in the entire municipality could be determined. This data is compared with the existing climate protection concept by the climate protection manager of the municipality of Oestrich-Winkel and, where possible, combined with existing measurements. The results were also</td></tr>
</table>

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| | made available as a shape file so that the municipality could import them into its own software solutions for further processing.<br><br>In addition to analysing all the buildings in the town, the public properties were also extracted from the simulation results. The data was compared with the energy performance certificates and preliminary analyses of the properties. By specifying the percentage of energy demand that could be saved at a given level of refurbishment, the municipality is given an overview of the contribution that its own properties can make to climate neutrality.<br><br>The following outcomes were generated during the assistance and provided to the community:<br><br>• Analyses of the potential for several refurbishment scenarios and photovoltaic (PV);<br>• Mapping the results to addresses;<br>• Feedback on the submitted rough analyses of the public state properties;<br>• Reconciliation of the rough analyses with the simulation results;<br>• Individual savings potential of the state properties. |

| **Project title** | **Speed-Up-Energy-Transition Korbach (SET-Korbach)** | |
|---|---|---|
| **Project description** | Small and medium-sized cities and municipalities in Germany face the challenges of having to provide all municipal services with a limited staff of diverse competences. Municipal heat planning provides the guiding principles for urban development and sustainable transformation of infrastructures for the energy transition in cities in rural areas. The city of Korbach is such a medium-sized city facing all the challenges listed above. Based on the diversity of problems, roles and focal points for action are defined and projects prioritized. The political anchoring and the involvement of the local population are the basis for the implementation in practice. The project “SPEED-UP ENERGY-TRANSITION KORBACH” serves this process by providing a sound data basis and potential analysis to base future concepts and strategies upon. | |
| **Support service type** | B.1 Building and City Quarter Simulation - Demand and Supply Simulation | |
| **Regional Hub** | Germany |  *Figure 11: Climate protection manager of the city of Korbach and a map of Korbach indicating the financial feasibility of PV systems* |
| **Duration of project** | Jan – Jun 23 | |
| **W4RES service partner** | HFT | |
| **Contact persons** | Christina Sager-Klaus (she/her) | |
| **Type of organisation** | Municipality Korbach in Germany | |
| | | |
| **Activities and results achieved through the services** | Main focus for Korbach city and its surrounding communities during the project was to get an overview of the heat demand and the PV potential for ca. 5.000 residential buildings. To achieve this the simulation platform SimStadt was utilized after the necessary 3D building models in CityGML-format were obtained as well as the development plans of the city.<br><br>The simulations for the heat demand and PV potential followed after that. The results were evaluated and summarized in three ways:<br><br>• Excel-files summarized the heat demand and PV potential per building address, including all results in pictures from a bird’s eye view;<br>• Shape-files with all results were created in order to allow the city to work with the results; | |

| | |
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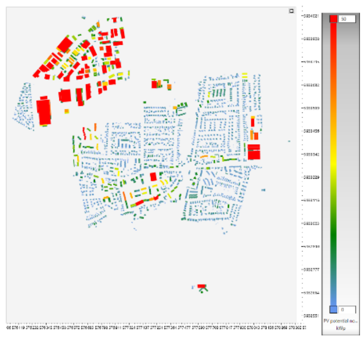
| | • A presentation with explanations of the methodology as well as the results explained with help of an exemplary district.<br>All results were handed over to the awardee.<br>In monthly meeting calls the awardee was updated about the progress. Furthermore, knowledge about the municipal heat planning process in the state of Baden-Württemberg was shared with the awardee.<br>On the 21st of September 2023 the project partner was invited to a meeting of city representatives in order to present the results from the joint project. About 40 city representatives and policy makers as well as about 50 citizens listened to the presentation and discussed the |

<table>
<tr><th>Project title</th><th colspan="2">Simulation of renewable energy potentials and promotion of renewable energies in electricity and heat supply in private households and municipal properties in Oststeinbek (DE)</th></tr>
<tr><td>Project description</td><td colspan="2">In Oststeinbek, almost half of the greenhouse gas emissions (GHG) amounting to a total of 24,000 t per year are attributed to the heating sector. The electricity sector is responsible for 31.5% (16,000 t) of the emissions. To increase the use of renewable energy sources (RES) and improve sustainability in the electricity and heating sectors of the municipality, the local government intends to analyse the photovoltaic (PV) potential of all roofs. These findings will supplement the existing climate protection concept. The HFT research team analysed the PV potential for Oststeinbek using the simulation platform SimStadt.<br>The municipality intends to use the data to reach out to its residents and highlight the potential of its properties. Equipped with more information, residents can choose to install PV systems which can improve the sustainability of the electricity and heating sector. The city plans to accomplish this either through a solar cadastre or personalized letters to individual homeowners.</td></tr>
<tr><td>Support service type</td><td colspan="2">B.1 Building and City Quarter Simulation - Renewable Energy Potential Assessment</td></tr>
<tr><td>Regional Hub</td><td>Germany</td><td rowspan="5"><br>Figure 12: possible nominal power of PV panels on roofs; red = > 50kWp, blue = 0-10 kWp</td></tr>
<tr><td>Duration of project</td><td>Dec 22 – May 23</td></tr>
<tr><td>W4RES service partner</td><td>HFT</td></tr>
<tr><td>Contact persons</td><td>Maria Pinsker (she/her)</td></tr>
<tr><td>Type of organisation</td><td>Municipality Oststeinbek in Germany</td></tr>
<tr><td></td><td colspan="2"></td></tr>
<tr><td>Activities and results achieved through the services</td><td colspan="2">The responsible state office obtained and prepared 3D city models for analysis of photovoltaic (PV) potential in the Oststeinbek municipality. The simulation platform requires specific data for each scenario, which must be individually entered in the models. Once the input data is entered, the simulation can be executed. The simulation relies on various databases, including an extensive weather model providing irradiation values and average temperatures, among others. The PV potential analysis results can</td></tr>
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| | be assigned to addresses, enabling the identification of building-specific potentials through the development plans provided by the municipality.<br><br>Maria Pinsker, the climate protection manager, has prepared a document that can be sent to house owners who are interested in knowing their own property's PV potential. The simulation results were used as data, and HFT provided explanations to enable homeowners to easily comprehend the technical data.<br><br>An external provider was contacted at the end of the project to investigate the potential of generating a solar cadastre based on simulation results. Following the W4RES service, the municipality of Oststeinbek established communication with the third-party service provider.<br><br>The following outcomes were generated during the service and provided to the community:<br><br>• Analysis of the potential for PV energy for all buildings in Oststeinbek;<br>• Results allocation to addresses for personalised letter creation;<br>• Response to the information letters provided to the homeowners;<br>• Development of informational material for ground-mounted PV potential;<br>• Inquiry for solar cadastre suppliers initiated. |

## 3.3 Technical projects in Greece

<table>
<tr><th>Project title</th><th colspan="2">RESUB – RES for urban buildings – An innovative cloud-based platform that enables multi-scale RES integration analysis towards cities' decarbonisation</th></tr>
<tr><td>Project description</td><td colspan="2">The RESUB platform is an innovative cloud-based platform under development that enables private and public investors and energy communities to measure their $CO_2$ carbon footprint and choose the most suitable renewable energy source (RES) technology. As a result of its innovative methodology, it enables RES integration on urban buildings, both on a single-building unit scale, as well as on a large-scale. RESUB aims to create a cloud-based, user-friendly platform that will accelerate the introduction of RES in the urban built environment, enabling cities' to progress towards energy independence in Greece, but also in Europe.</td></tr>
<tr><td>Support service type</td><td colspan="2">B.1 Building and City Quarter Simulation - Renewable Energy Potential Assessment</td></tr>
<tr><td>Regional Hub</td><td>Greece</td><td rowspan="6"><br>Figure 13: Project leader Dr. Ifigeneia Theodoridou</td></tr>
<tr><td>Duration of project</td><td>Jan – Jun 23</td></tr>
<tr><td>W4RES service partner</td><td>HFT</td></tr>
<tr><td>Contact persons</td><td>Ifigeneia Theodoridou (she/her)</td></tr>
<tr><td>Type of organisation</td><td>Start-up</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Activities and results achieved through the services</td><td colspan="2">HFT Stuttgart has many years of experience in the development of tools and platforms for building energy systems, including renewable energies (SimStadt). During a virtual walk-through of the cloud-based platform this expertise was utilized and shared throughout the duration of the service. Since an NDA was signed, specifics of the meetings are not enclosed in this Deliverable.<br>The collaboration was fruitful though, leading to a joint application for another project within the scope of the call: HORIZON-WIDERA-2023-ACCESS-02-02: Twinning Green Deal.<br><br>The application deadline (September 28th) was met an both parties looking forward to have the possibility to work together again. The proposed projects DecURB aims to improve the scientific capacity of the Widening Partner – Aristotle University of Thessaloniki (AUTh) and stimulate its excellence in the</td></tr>
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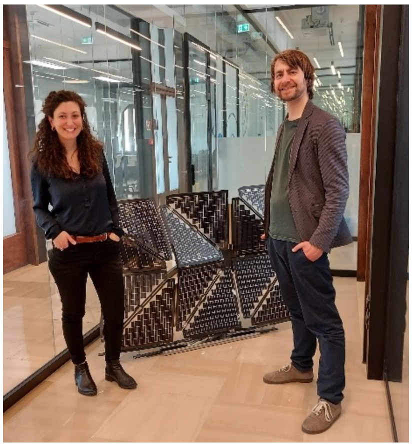
| | research field of the holistic decarbonisation of urban residential building stocks through innovative pathways towards their efficient renovation based on the design and use of "digital twin" technologies. The project is planned for three year and together with AUTh from Greece and HFT from Germany also the University Delft from the Netherlands belongs to the project consortium. |

## 3.4 Technical project in Italy

<table>
<tr><th>Project title</th><th colspan="2">Levante – energy everywhere</th></tr>
<tr><td>Project description</td><td colspan="2">Levante is a Greentech start-up that has developed and patented an origami-inspired foldable solar panel that can be taken anywhere to generate clean energy.<br>The aim of the Levante PV modules is to have a mobile and sustainable power generator that can be taken on trips, used in applications, but also installed at home, e.g. on the balcony. This multiple use will maximise the $CO_2$ savings from the use of the product and minimise the carbon footprint of the user. Levante aims to produce and consume greener electricity in the future, wherever you are. In addition, the company is committed to sustainable production and, together with the W4RES project, intends to focus on the $CO_2$ footprint of its own product - the portable PV modules.</td></tr>
<tr><td>Support service type</td><td colspan="2">B.2 Environmental Impact Assessment - Impact Assessment of Energetic Design Choices</td></tr>
<tr><td>Regional Hub</td><td>Italy</td><td rowspan="5"><br>Figure 14: Founders of Levante and their product: the foldable PV-Panel</td></tr>
<tr><td>Duration of project</td><td>Feb – Jun 23</td></tr>
<tr><td>W4RES service partner</td><td>HFT</td></tr>
<tr><td>Contact persons</td><td>Sara Plaga (she/her)<br>Kim Plaga (he/him)</td></tr>
<tr><td>Type of organisation</td><td>Start-up</td></tr>
<tr><td></td><td colspan="2"></td></tr>
<tr><td>Activities and results achieved through the services</td><td colspan="2">Building on the results of the first round of support services, which calculated the carbon footprint of Levante's first prototype, the second round focused on the further development of the prototype. The structure of the PV modules was revised by Levante and, based on the carbon footprint results, new suppliers with a significantly lower carbon footprint were included.<br><br>The carbon footprint analysis of the second prototype was more in-depth and detailed than the first. In addition, the calculated $CO_2$ value for a</td></tr>
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| | Levante PV module was compared with similar products on the market that are manufactured in China.<br><br>The $CO_2$ analysis will enable Levante to make its product even more climate-friendly and will show which components, countries of origin and transportation methods can be used in the future.<br><br>In addition to the $CO_2$ analysis, the focus was on a so-called Use Case Builder. This has been developed exclusively for Levante. The Excel-based tool makes it possible to calculate the $CO_2$ substitution of a Levante PV module in different use cases. Levante can choose how many PV modules are used, in which month the module is used, where it is used and which energy source it substitutes. This shows how much $CO_2$ can be saved by using Levante PV modules.<br><br>At the end of the project, Levante received the following results:<br>• Detailed $CO_2$ analysis of the prototype;<br>• Excel-based Use Case Builder.<br><br>The combination of these two results allows Levante to calculate the $CO_2$ payback time and thus assess the impact of its product. |

| **Project title** | **Green Duct** | |
|---|---|---|
| **Project description** | The scope of the project is to build a business starting from the commercialisation of a patented product through a spin-off foundation based on the research results of the team members and the University of L'Aquila (DICEAA Department) on the topic of energy efficiency and sustainability in retrofit interventions. The spin-off's first product is a patented device for intelligent passive cooling of interiors. The product has a preferential application in historical buildings: the innovative system presents a low material impact and a reversible installation for the protection of architectural and landscape values and the view of the cultural heritage as a whole system (environment-architecture-users-plants). In addition, the design and aesthetic characteristics of the equipment guarantee recognisability and pleasantness, integrating in a compatible way with the historical envelopes, while presenting a contemporary and charming appearance.<br>The business activity would improve the quality of life in historic buildings, contributing to the well-being and comfort of urban life through an innovative, reversible, sustainable and flexible ventilation duct. The intelligent management of the device's operation will also make it possible to reduce the energy consumption of air-conditioning systems. Finally, it will enhance the architectural heritage to which the device will be applied.<br>This activity also aims to develop new, innovative, intelligent and sustainable products for the well-being of people in the built environment. | |
| **Support service type** | B.3 Monitoring – Advice for pilot project implementation | |
| **Regional Hub** | Italy | No picture |
| **Duration of project** | Jan – Mar 23 | |
| **W4RES service partner** | CIVI | |
| **Contact persons** | Mariangela De Vita (she/her)<br>Eleonora Laurini (she/her) | |
| **Type of organisation** | University – Spin off / Start-up | |

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| **Activities and results achieved through the services** | Our activities started with a thorough feasibility assessment of the GREEN DUCT project, which included an evaluation of the technical, economic, financial and environmental aspects of the project. This assessment helped to identify any potential issues or challenges that may arise during the implementation of the project.<br><br>To do this, we collected information about the project and analysed the data to determine its feasibility. This process included market research, identifying potential customers and analysing the competition to determine the potential success of the project.<br><br>An important tool in this process was a financial model, which we created and delivered to the entrepreneurs in mid-April 2023. This is a tool that allows you to analyse the financial aspects of the project, such as cash flow, profitability and return on investment (ROI, ROE, IRR, DSCR, etc.). By creating a financial model, we have been able to provide valuable insight into the financial performance and bankability of the project. This can be useful to potential investors or lenders in assessing the viability of the project.<br><br>The project plan we provide describes the actions required to successfully complete the project. This plan includes important details such as deadlines, budget, resource requirements and milestones. By having a well-defined project plan, the women entrepreneurs behind the project have a clear understanding of what needs to be done and when to expect the success of the project.<br><br>Overall, the support services we provided were crucial in helping the entrepreneurs to launch and successfully grow their start-up project. By conducting a thorough feasibility analysis, creating a financial model and developing a detailed project plan, we also helped to increase their chances of obtaining funding from banks or other investors. |

# 3.5 Technical projects in Slovakia

| Project title | Planning and capacity building for a successful heat supply transformation | |
|---|---|---|
| Project description | Friends of the Earth-CEPA is pioneering work with Slovakian communities to demonstrate the benefits of replacing existing heating systems with innovative, renewable and sustainable solutions. The long-term goal of the project is to support a pilot project for a low-temperature district heating system in the Upper Nitra region and to demonstrate the concrete potential in one community through feasibility studies.<br>As an NGO, they are always looking for supporters and experts who can contribute their skills and expertise to their projects. W4RES is an excellent choice to work together on the tasks at hand. Friends of the Earth-CEPA is looking for technical feedback on their pre-feasibility study for a low-temperature heating system in Partizánske and to network with experts in renewable heating concepts from Germany. | |
| Support service type | B.2 Environmental Impact Assessment - Life Cycle Assessment of Buildings and City Quarters | |
| Regional Hub | Slovakia | <br>*Figure 15: Connecting experts* |
| Duration of project | Jan – Jun 23 | |
| W4RES service partner | HFT | |
| Contact persons | Lenka Ilčíková | |
| Type of organisation | Association consisting of three environmental NGOs | |
| | | |
| Activities and results achieved through the services | W4RES' support in this project focused mainly on technical feedback on the feasibility study of the Partizánske heat network. The study is divided into two phases. In the first phase, renewable energy sources (RES) with significant $CO_2$ reduction potential are investigated in the heat network of one settlement. The second phase of the study will cover more areas and increase the share of RES in the heating network so that it can be lowered in temperature. For this purpose, feedback was obtained from a professor and a PhD student from HFT Stuttgart.<br>In addition, CEPA received information on municipal heat planning in Germany, as well as comprehensive collections of legal texts, regulations and job descriptions and funding opportunities for so-called climate | |

| | |
|---|---|
| | protection manager positions in German municipalities. During the project, CEPA was able to establish contact with the AGFW, which led to an interesting exchange of different projects. The AGFW is an independent and neutral umbrella organization that promotes cogeneration, (district) heating and cooling on a national and international level. As a result, the exchange was beneficial for both sides.<br><br>Friends of the Earth-CEPA received the following documents and support from W4RES:<br><br>• Feedback on prefeasibility study;<br>• A collection of laws and ordinances that apply in German municipalities to meet climate targets and use renewable energy;<br>• Job descriptions and funding documents of climate protection manager positions in German municipalities;<br>• Contact to experts in the field of sustainable heating networks. |

# 4 TARGETS AND TARGET ACHIEVEMENTS

## 4.1 Decrease of development time and effort

As indicated in Deliverable 2.7, it is imperative that all activities executed within the framework of market uptake support measures attain well-defined objectives. This principle extends to the activities expounded upon in this specific report.

The aims and targets within the Market Uptake Plan, explained in Deliverable 2.7 in Section 2.2 "Deployment Activities and Targets", shape the foundation upon which the technical as well as the business and innovation support services are deployed. A thorough depiction of the deployment activities and targets earmarked for the deployment of these services can be found in **Table 1**, and are a replication of the table in Deliverable 2.7.

The targets were:

- Decrease of project development time
- Reduction of required project development efforts

As stated in the first column in **Table 1,** different activities within the project context helped to achieve these targets. In the last column the target achieved is stated.

*Table 1: Activities and targets for the deployment of support services for the second round specified in Deliverable 2.7*

| Activities | Targets | Target achievements |
|---|---|---|
| Business planning services, with the use of sustainable model innovation tools, well suited for RHC projects, to avoid pitfalls and accelerate the development process. The technical support services will also contribute to the decrease of the project development time, with the use of simulation tools and impact assessments for the development | Decrease of project development time >20% for at least one supported project and >10% on average across all supported projects | Decrease of project development time 86%. on average across all supported projects. |
| Through the W4RES business and innovation support services, the supported projects will be provided with well tested tools, valuable advice, feedback from professionals and industry know-how. The access to key networks will also constitute a valuable activity. | Reduction of required project development effort >10% for at least one supported project and >5% on average across all supported projects | Reduction of required project development effort 85% on average across all supported projects. |

To evaluate the aforementioned objectives and gauge the extent of their accomplishments, a comprehensive survey was formulated. This survey was distributed to all awardees who received services, facilitating an evaluation of their progress and outcomes. Out of a total of 30 awardees, 22 engaged in the survey, and all eleven projects that received a technical support service participated in the survey. Participants could choose on a scale of 0 to 5, with 0 representing 0% progress and 5 representing 100% progress on their project development.

The following question was asked for the **target**: **decrease of development time:**

1. "Did you receive a consulting service? If yes, then: What was the progress made in the development of your project thanks to the W4RES support services?"

The results for the question was 82% for the business and innovation support services and 91% for technical services (see **Table 2**). The average for all the services was 86%.

With regard to the objectives, **targets** of **reducing the required project development effort**, the following question was asked:

2. "Did you gain access to results? If yes, then: What was the progress made in the development of your project thanks to the W4RES access to results /information /knowledge?".

Every project indicated a progress level of over 50% in their project development. This aligns with a reduction in the overall effort required by each project partner.

*Table 2: Results of the evaluation survey in regards to the targets second round*

| Second Round: 22 participants | **All projects** | | **Business** | | **Technical** | |
|---|---|---|---|---|---|---|
| **Questions** | **Average points** | **%** | **Average points** | **%** | **Average points** | **%** |
| 1. Did you receive a consulting service?<br><br>If yes, then: What was **the progress made in the development of your project** thanks to the W4RES support services? | **4,32** | **86%** | **4,09** | **82%** | **4,55** | **91%** |
| 2. Did you gain access to results?<br><br>If yes, then: What was the progress made in the development of your project thanks to the W4RES access to results / information / knowledge? | **4,23** | **85%** | **4,09** | **82%** | **4,36** | **87%** |

The consortium successfully fulfilled the targets in both rounds. The overall results of both rounds can be found in **Annex 6.5.**

## 4.2 Number of renewable energy sources (RES) and Technologies

The United Nations define renewable energy sources (RES) as: "…energy derived from natural sources that are replenished at a higher rate than they are consumed. Sunlight and wind, for example, are such sources that are constantly being replenished."[2]

The Directive (EU) 2018/2001 of the European Parliament and of the Council of 11th December 2018 lists the following RES: "wind, solar (solar thermal and solar photovoltaic), geothermal energy, ambient energy, tide, wave and other ocean energy, hydropower, biomass, landfill gas, sewage treatment plant gas, and biogas"[3]. While most renewable energy sources such as wind, solar or hydro are self-explanatory, the sources *ambient energy* and *geothermal energy* are explained in further detail: "*ambient energy* means naturally occurring thermal energy and energy accumulated in the environment with constrained boundaries, which can be stored in the ambient air, excluding in exhaust air, or in surface or sewage water; *geothermal energy* means energy stored in the form of heat beneath the surface of solid earth."

In accordance with these definitions, the evaluation of the different types of RES covered in the supported projects were classified in seven categories[4]:

1. Wind
2. Solar
3. Geothermal
4. Ambient (heat)
5. Hydro (including ocean energies)
6. Biomass
7. Waste (including landfill gas, sewage treatment, plant gas and biogas)

All 56 supported projects during the first and second round have been assigned to these seven categories (see **Table 3**) with the following results:

*Table 3: Target achievement of covered RES of supported projects*

| Target | Target value | Status | Achieved value |
|---|---|---|---|
| Types of RES covered | >3 | RES covered in first round:<br>Solar, geothermal, ambient, biomass, waste, wind<br><br>RES covered in second round:<br>Solar, geothermal, ambient, biomass, waste, wind | 6 |

[2] https://www.un.org/en/climatechange/what-is-renewable-energy, accessed 6th Sept. 2023

[3] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32018L2001, accessed 6th Sept. 2023

[4] Deviations between the RES types in the Directive (EU) 2018/2001 are due to practical reasons.

In both rounds, six different types of RES have been covered, with hydropower being the only RES that has not been addressed. This may be due to the fact that hydropower tends to be used for electricity generation only, rather than directly in the renewable heating and cooling sector, and that most of the EU's hydropower potentials are fully exploited, with technological valorisation of the remaining potentials often facing opposition from environmental concerns.

With regards to the covered technologies that enable the utilization of RES, **Table 4** indicates the overall achievements. The figures in *italics and parentheses* are the number of technologies that do not directly use renewable energy but have a significant impact on the achievement of the zero emissions targets in the heating and cooling sector.

*Table 4: Target achievement of covered technologies of supported projects*

| Target | Target value | Status | Achieved value |
|---|---|---|---|
| Types of technologies covered: | >5 | Technologies covered in first round:<br>Wind turbine, photovoltaic, solar thermal panel, heat pump (ambient air, geothermal, sewage), concentrating solar plant (CSP), electric boiler, co-generation units, evaporation unit, heat-recovery system, (*district heating, refurbishment, phase changing mortars for higher energy efficiency in building, battery storage)* | 9 *(3)* |
| | | Technologies covered in second round:<br>Wind turbine, photovoltaic, solar thermal panel, heat pump (ambient air, geothermal, sewage), hydrothermal carbonization (HTC), catalytic pyrolysis, pellet combustion, patented passive cooling unit, (*refurbishment, carbon capture and storage (CCS), hydrogen-electrolysis/ transformer, district heating, digitalization*) | 11 *(6)* |
| | | Total technologies (without counting the double mentoring) | 13 *(7)* |

An overview of all 56 projects and their addressed RES and technologies is provided in **Annex 6.3.**

## 4.3 KPI-7: Environmental impact

The environmental impact of all supported projects was evaluated based on qualitative indicators. For each project, its positive environmental impact was assessed through three criteria, which are assigned numerical scores and summed up; the total score thus obtained per project determines its positive impact, with a higher score implying a greater impact.

The three criteria are:

**Criterion 1: Locality impact**

The projects are ranked by the "locality" of their impact, with more points awarded for a geographically wider impact. Four categories were defined: a purely local impact on a city or community level is rated with one point; impact created on a regional level is rated with 2 points; a national impact with 3 points; and an impact on EU scale or beyond is rated with 4 points.

**Figure 16**: results for all 56 projects. 13 projects had a local impact, 10 a regional impact, 20 a national impact, and 12 an international impact. Detailed information regarding the evaluation of Criterion 1 can be found in **Annex 6.4.**

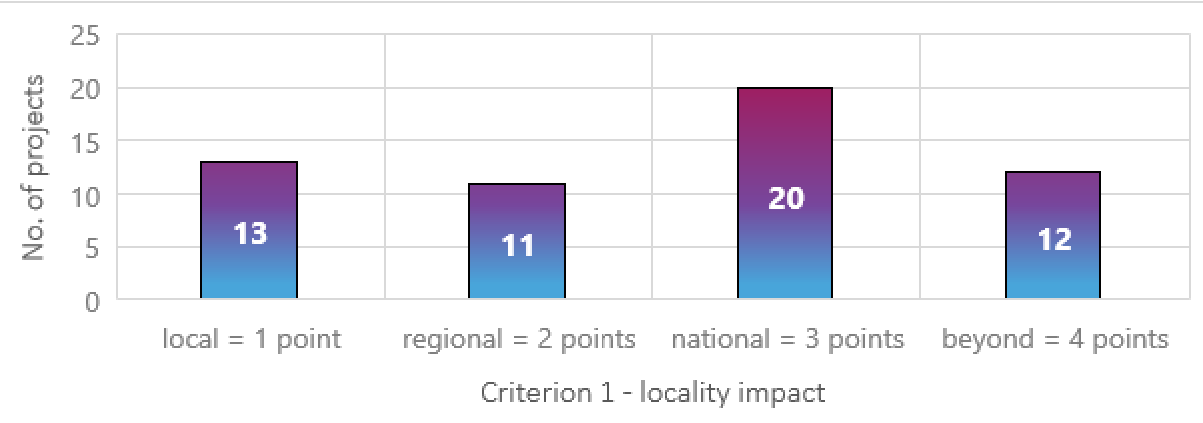


*Figure 16: Criterion 2 - No. of supported projects with regards to the environmental impact as locality scale*

**Criterion 2: Environmental dimensions**

The European Commission provides a list of environmental dimensions that shall be considered in the context of an Environmental Impact Assessment (EIA):

- population and human health,
- biodiversity,
- land,
- soil,
- water,
- air,
- climate,
- landscape,
- material assets,
- cultural heritage[5].

As for our rating, the more dimensions addressed by a project, the more points awarded, each dimension being worth one point.

**Figure 17** presents the overall results for the total environmental impact score of all supported projects. Of these, 38 addressed at least one dimension, 10 addressed two dimensions; more than two dimensions were addressed by seven projects, with one project, the UIA world congress, addressing, almost by definition, all dimensions. Not surprising given the scope of W4RES, the dimension *climate* with a focus on $CO_2$ emission reduction was the most prominent dimension. Detailed information regarding the evaluation of Criterion 2 can be found in **Annex 6.4.**

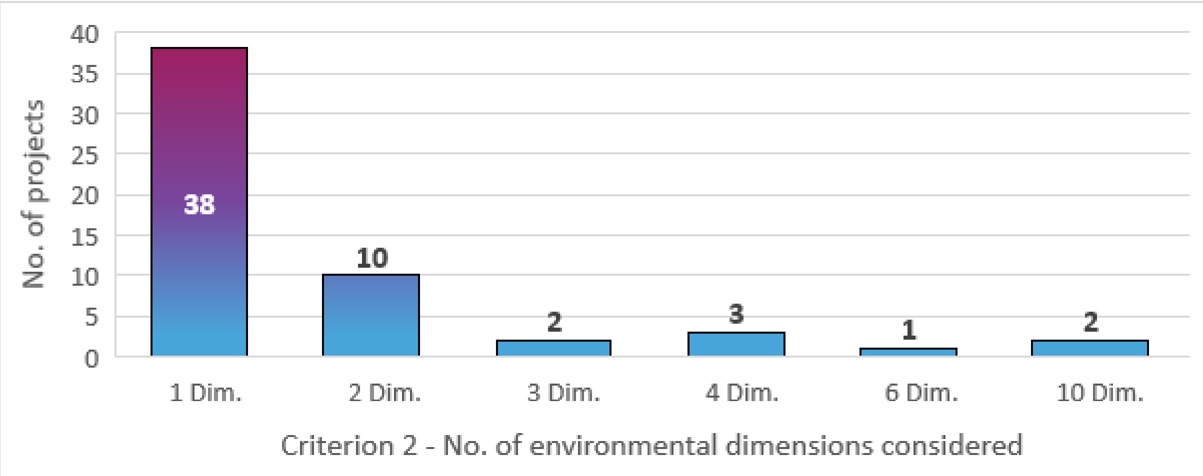


*Figure 17: Criterion 2 – No. of environmental dimensions considered by the supported projects*

[5] https://environment.ec.europa.eu/law-and-governance/environmental-assessments/environmental-impact-assessment_en, accessed on 11th September 2023

**Criterion 3: Indirect or direct impact**

This criterion assessed the projects in terms of their direct or indirect impact. A direct impact means that the project has a positive and targeted effect on one or more environmental dimensions, such as reducing waste or saving $CO_2$ emissions, while an indirect impact means that a project aims to disseminate information on creating a positive impact in any environmental dimension through others but does not itself lead to a measurable impact. **Figure 18** presents the results for the 56 projects, with 25 projects having an indirect impact and 31 having a direct impact. More details regarding Criterion 3 evaluation are available in **Annex 6.4.**

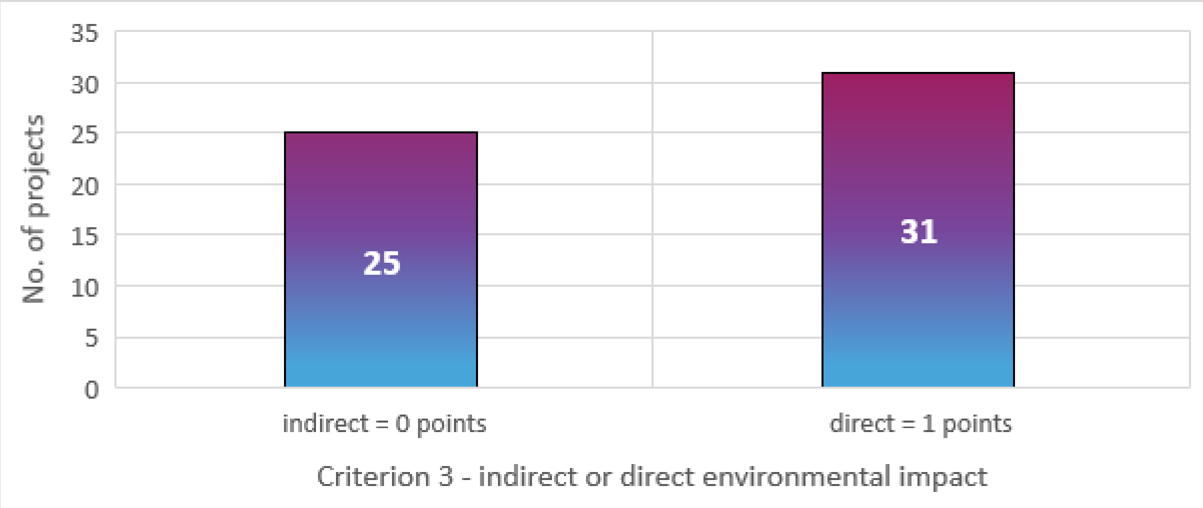


*Figure 18: Criterion 3 - No. of supported projects with indirect and direct environmental impact*

**Total EI score**

The scores achieved across criteria1-3 are added to obtain W4RES' Environmental Impact (EI) score. The higher the EI score, the more positive the EI impact of a supported project. **Figure 19** shows the EI score distribution of all 56 projects. The projects' EI score ranges from 2 to 15, with most projects, 48 out of 56 projects, reaching a score between 3 and 6. All projects reaching (substantially) higher EI scores yielded a high scoring especially in Criterion 3, i.e. the number of environmental dimensions considered. Detailed information regarding the evaluation of the total EI score can be found in **Annex 6.4.**

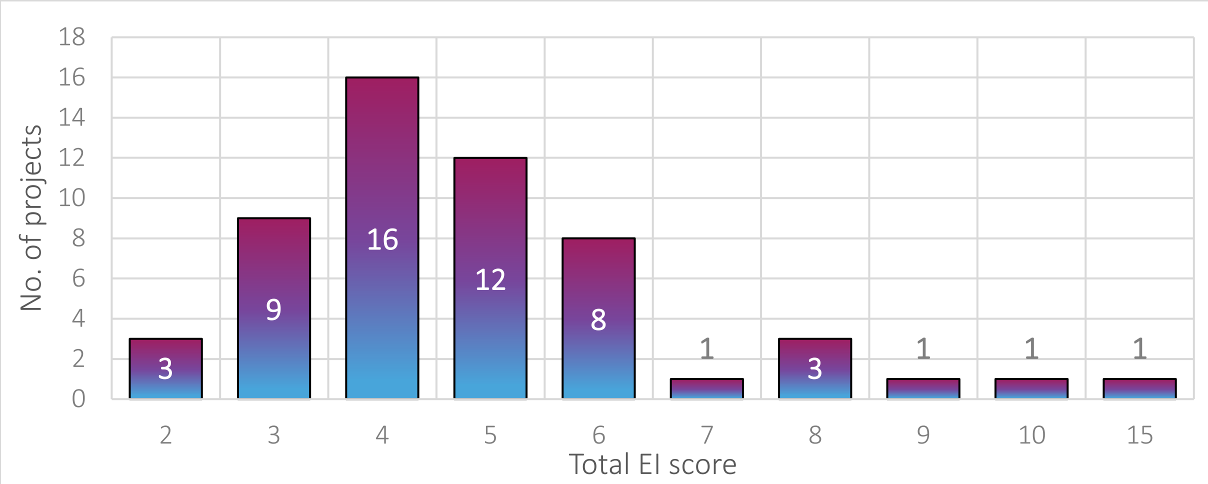


*Figure 19: Total EI score for all 56 supported projects.*

The target achievement of KPI-7 was evaluated with this qualitative methodology. All projects with a direct environmental impact were considered as projects contributing to this KPI, adding up to 31 projects. **Table 5** summarizes these results for KPI-7.

*Table 5: Target achievement of KPI-7 - summary*

| Target | Target value | Status | Achieved value |
|---|---|---|---|
| Assessment of environmental impact | >30 | Qualitative environmental impact analysis for all 56 projects considering three criteria:<br>• Indirect/direct impact<br>• Locality<br>• Environmental dimensions considered | 31 |

Out of 56 supported projects 31 projects were found to have a direct positive impact on at least one environmental dimension, meeting the target of >30 projects assessed with an environmental impact.

# 5 CONCLUSION & SUMMARY

**Deliverable 3.6** provides an overview and detailed information on the execution of the technical support services in the framework of the EU project W4RES as well as the target achievements of the overall KPI-7: the assessment of the environmental impact.

This report outlines the technical support services provided by the consortium partners and describes the process used to identify the specific needs of the applicants. After assessing the needs of each project that applied, and prioritising them in online meetings with each applicant, the W4RES consortium partners were matched with the applicants. The outcome of this matching process is presented in this Deliverable.

With the offering of these technical support services and the described methodology, a total of 21 women-led projects were scouted during both rounds in the Regional Hubs; eight in the first round; 13 in the second round. In total, the support services were completed for 18 projects. Three projects withdrew their proposals because they had already found another solution before W4RES' support service could have started, or because they changed their objectives such that these could not be covered by the support services offered.

During the second round of support services, the three consortium partners CIVI, EAP and HFT provided technical support for eleven projects. Combined with the first round of support services, a total of 18 projects received technical assistance over the service period. The central focus of this report is a detailed outline of the technical services provided. Each project supported during the second round of support services is summarised in an overview, followed by a comprehensive description of the activities and outcomes in **Section 3** of this report. For detailed reports on the projects that received technical support during the first round of support services, reference is made to Deliverable 3.2.

The supported projects of the second round were located in Bulgaria, Germany, Greece, Italy and Slovakia. In Bulgaria, a project was supported that developed scenarios for the national-level heating and cooling sector. Another Bulgarian project focused on assessing technologies for producing solid biofuels from organic waste. The third project from Bulgaria aimed to explore the photovoltaic potential of the National Trade and Banking High School in Sofia. In Germany, four municipalities applied to gain insights into the energy and $CO_2$ savings potential of building-related measures such as refurbishment, photovoltaic potential, and other possible renewable energy sources for the supply of their region In Italy, a start-up in the photovoltaic sector received support for their foldable PV panel by calculating the adapted $CO_2$ footprint after sourcing from local suppliers to shorten supply chains, resulting in $CO_2$ savings. Additionally, an Excel-based Use Case Builder was developed to estimate the $CO_2$ savings of the PV panel for different use cases. The project in Slovakia focused on the implementation of a district heating system based on a geothermal and solar thermal plant in a pre-feasibility study, and liaised with other experts in the field.

The report concludes in **Section 4** with an explanation of the objectives set for the technical services and their degree of achievement. It was shown that the technical services were able to make a significant contribution to reducing the effort required for the supported projects' development. The awardees reported in a survey that on average their time progress could be advanced by over 80%. Furthermore, the supported projects involving municipalities were able to engage with over 150 stakeholders due to the fact that different departments of the municipalities were involved and results were presented in public meetings, inviting the general public to participate.

A detailed analysis was conducted of the overall targets of renewable energy sources (RES), technologies and the environmental impact (KPI-7) of all projects that received technical, business and innovation support services. The projects addressed six RES, solar, geothermal, ambient, biomass, waste, and wind, which exceeds the target value of more than three RES. Also, with regards to the types of RES technologies, thirteen different technologies were identified, which include wind turbines, photovoltaic cells, solar thermal panels, heat pumps (ambient air, geothermal, sewage), concentrating solar plants (CSPs), electric boilers, co-generation units, evaporation units, heat-recovery systems, hydrothermal carbonization (HTC), catalytic pyrolysis, pellet combustion, and patented passive cooling units. This surpasses the target value of five. The Environmental Impact (KPI-7) of the projects was qualitatively assessed based on three criteria: 1 - locality, 2 - environmental dimensions (as defined in **Section 4**), and 3 - indirect or direct environmental impact. Out of 56 supported projects, 31 projects were found to have a direct positive impact on at least one environmental dimension, meeting the target of >30 projects assessed with an environmental impact.

# 6 ANNEXES

## 6.1 Annex I: Technical support services

### Technical support services by CIVI

| Thematic section | Service Name | Description |
|---|---|---|
| **B.3** | *Monitoring* | The aim of the service is to evaluate technical KPIs e.g. on renewable, non-renewable energy consumption, renewable energy share and CO2-eq emissions from monitored data provided by the client from its energy system (e.g. PV field, DHC system, CCHP plant, etc.) |
| **B.3** | *Energy audit and performance certifications* | The aim of the energy audit is to obtain in-depth knowledge of energy uses and consumption of the plant under examination in order to identify the most effective energy efficiency measures. It will identify the main solutions for reducing energy consumption or installation of renewables as a result of a techno-economic analysis. |
| **B.3** | *Advice for pilot project implementation* | The aim of the service is to support the preliminary design of an RHC pilot plant for the test of its performance in a laboratory or field. |

### Technical support services by EAP

| Thematic section | Service Name | Description |
|---|---|---|
| **B.1** | *Energy performance auditing, certification & consultancy for EE and/or RES* | This is a service for public and private buildings. (Covers all national requirement for licensed auditing and) provides all necessary documentation for the building to apply for funding or justify the costs. Consultations on potential EE and RES measures to be realised in the building with increased priority and makes the technical and financial assessments for their implementation. |
| **B.1** | *Thermal imaging via drone for public and private buildings* | This type of thermal imaging allows for comprehensive investigation of RES installations mounted on the rooftops. |
| **B.1** | *Technical feasibility studies for EE and/or RES technologies* | Designing and supporting the implementation of EE and/or RES solutions for positive energy blocks. |
| **B.3** | *KPI indicated energy and environmental monitoring* | Offers energy and environmental monitoring based on pre-defined and specific KPIs. |

## Technical Support Services by EGC*

| Thematic section | Service Name | Description |
|---|---|---|
| **B.1** | *Support for municipalities and citizen-organizations in the initial phase of a "green city"* | Developing green cities by supporting the creation of innovation projects, facilitating stakeholder processes, carrying out analysis, implementing best practice, training in sustainable urban development and dissemination. We mentor the initial phase of the development of the "green city", e.g. by helping put the team of partners, cities, organizations, companies and consultants together and defining the first steps by means of the UN 17 Sustainable Development Goals. technical and financial assessments for their implementation. |
| **B.1** | *Support for energy communities* | Supporting the initiation and development of energy communities consisting of local stakeholders within a geographically defined area. EGC has expertise in the legal framework in a Danish context when it comes to the implementation of PVs and charging points within an energy community. |
| **B.1** | *Support for environmental renewal concepts* | EGC has in-house and external experts in energy savings, circular economy, and biodiversity. The Environmental Renewal service involves the creation and implementation of a holistic plan to utilize this expertise and strengthen the indoor and outdoor living environments in your neighbourhood or city. |
| **B.3** | *Monitor "green cities" (UN 17 SDGs)* | Using the UN 17 SDGs to monitor the results of the "green cities". EGC has experience working with cities in Denmark to develop their city into a 'green city'. This involves:<br>1) the 'business service' of mentoring of these cities in their journey to holistically and inclusively transition their energy and mobility systems to sustainable ones<br>2) the 'technical service' of implementing (strategically assessing the opportunities within a city and sharing knowledge) and<br>3) the 'technical service' of monitoring the development of the 'green city'. Holistically, this can also be seen as a 'technical service' of building and city quarter simulation (see column M).<br>Monitoring in this regard involves the use of the SDGs to monitor the results of the Green City development progress. |

| Thematic section | Service Name | Description |
|---|---|---|
| **B.4** | *Knowledge sharing in establishment of green cities* | Knowledge sharing in establishment of green cities to expand the number of green cities throughout Europe. EGC cooperates and shares their experiences working with cities in Denmark to develop their city into a 'green city'.<br><br>This involves<br>1) the 'business service' of mentoring of these cities in their journey to holistically and inclusively transiting their energy and mobility systems to sustainable ones<br>2) the 'technical service' of implementing (strategically assessing the opportunities within a city and sharing knowledge), and<br>3) the 'technical service' of monitoring the development of the 'green city' Holistically, this can also be seen as a 'technical service' of building and city quarter simulation<br><br>Knowledge sharing in this regard involves:<br>1) the strategic assessment of a city's needs, taking root in interested parties' and stakeholders' strengths and interests<br>2) sharing knowledge and developing plan for the implementation of best practice |
| **B.5** | *Energy certification through cooperation partner in Denmark* | Energy certification through a very close cooperation partner in Denmark. We need to use partners in other countries for providing this service in case we participate in the development of green cities.<br>Preparation and implementation of energy certificates in Denmark with a close partner. |
| **B.5** | *Support for Svanemærket certification* | Research and preparation for applications for Danish sustainability certificate: Svanemærket. |

* Services provided by EGC were not included in the second round of projects because EGC utilized its available hourly quota for the support services during the first round.

# Technical support services by HFT

| Thematic section | Service Name | Description |
|---|---|---|
| **B.1** | *Demand and supply simulation* | Simulation of residential city quarter demands on single-building level based on 3D building model data. Dimensioning and simulation of heating (possibly also cooling) technologies to satisfy above-mentioned demands (e.g. heat pump, CHP). Dimensioning and layout of heating grids. |
| **B.1** | *Renewable energy potential assessment* | Assessment of rooftop photovoltaic electricity generation potentials; potentially assessment of biomass and free-field PV potentials in surrounding areas (depending on availability of digital landscape models). |
| **B.2** | *Impact assessment of energetic design choices* | Impact assessment of city planning aspects (building orientation, urban green, open spaces…) on heating and/or cooling demand of buildings in city quarters, e.g. assessment of impact of rooftop greening on heating/cooling demand and water runoff, urban domestic water demands, etc. |
| **B.2** | *Life cycle assessment of buildings and city quarters* | Life Cycle Assessment of building construction and refurbishment. |
| **B.4** | *Assessment of sector coupling effects* | Conceptual / high level assessment of sector coupling effects, e.g. heating and electricity sector, inclusion of electric vehicles. |
| **B.5** | *Technical training / "micro credits"* | Training of project teams on technical aspects, e.g. sector coupling, RHC technologies, building physics etc.; support in bringing key stakeholders (mayors, public, project partners) "up to speed" on technical aspects of RHC projects. Such courses might be eligible for mandatory training programmes in certain professions, e.g. architects. |

## 6.2 Annex II: Needs Identification: Prioritizing in the Service Action Plan

| No. | Regional Hub | Project | Needs Identified |
|---|---|---|---|
| **1** | Belgium | Second green life of wind turbine blades | The project is still at its initial phase/ conceptualization and revolves around the production of vehicle parking shelters in public places out of disposed wind turbine blades with integrated solar panels. The main business need revolve around a better understanding of the already existing use cases, technologies and market for the waste material derived from wind turbine blades; the project manager also expressed interest / need for technical support in terms of a development plan supporting her R&D activities. |
| **2** | Bulgaria | Biovalorization of winery industry waste to produce value-added products. Production of anthocyanins from by-product of winery industry | Seeks business opportunities for investing the technology into a market product. Prefers Bulgarian service provider. |
| **3** | Bulgaria | Recovery of phosphorus from dewatered sewage sludge | Seeks technical support on the recovery process and a follow-up business plan for different products development |
| **4** | Bulgaria | Scenarios development for heating and cooling sector in the context of decarbonisation | Technical support for the development of the RES concepts to be integrated in local-level decarbonisation scenarios; looks for funding opportunities to make this analysis a market product (most likely municipalities as clients). Prefers Bulgarian service provider. |

| No. | Regional Hub | Project | Needs Identified |
|---|---|---|---|
| **5** | Bulgaria | Technologies for production of solid biofuels from organic waste | Technical support for defining the technologies for production of solid biofuels from organic waste; business support for estimating the best cost-to-benefit technologies on the market and their position in the value chain. Prefers BG mentor |
| **6** | Bulgaria | ZOYO Card – digital business cards | Has been distributing the card to various clients and wants to expand its market. Needs business support for procurement of the offering and DIRECT access to clients and markets. Prefers EU/International service partner. |
| **7** | Bulgaria | BUILDING PHOTOVOLTAIC PARK ON THE ROOF OF THE NATIONAL TRADE AND BANKING HIGH SCHOOL - SOFIA BULGARIA | Has the technical idea for the technical implementation of the project and wishes to focus on the financial and economic analysis. The demand is for technical verification and the financial analysis development. Prefers EU/International service partner. |
| **8** | Denmark | Action Energy Finance Oy | They have a tool that has been piloted in Finland, and would like to be piloted in DK/NO/DE, that connects housing organizations with technical and financing partners for concrete energy/heat projects:<br>1. Feedback on existing competition i.e. is there already a similar service<br>2. Trying to identify parties in Denmark, Germany, or Norway to set up a pilot project with and introduce us to them (i.e. facilitate to get us started)<br>3. Help us get a word out among the service providers about the pilot. This can be in the form of a mailing list / webinar, etc<br>4. Give feedback on how the energy renovation needs of housing associations in the Danish, German, or Norwegian market differ from the Finnish market. |

| No. | Regional Hub | Project | Needs Identified |
|---|---|---|---|
| **9** | Denmark | UIA World Congress 2023 in Copenhagen Communication Booster | Access to networks/help promoting their materials through large networks (for international conference). They need to recruit people to come to their congress in July (world architecture congress), and also to attract potential workshop holders/speakers regarding the built world (architects, engineers, planners, politicians, etc.). Theme: Leave No One Behind. |
| **10** | Denmark | High5Girls | They found it very helpful to get from the first round of calls: workshops which helped them understand the EU application process (where they are completely new); a list of 5 potential projects they could apply for moving forward, they would love support in:<br>1. taking the next steps in the application process. Actually, writing an application/activating their already existing network in writing an application together<br>2. potentially identifying programs/projects which are specifically about women in STEM (Steinbeis' suggestions were in energy-world, followed up by ECWT) |
| ***11*** | *Germany* | *Networking and cooperation of settlements by improving and linking buildings as well as introducing intelligent supply mains and renewable energies.* | Technical Needs:<br>Analyse the status quo of the settlements - analyse the potentials for renewable heating and refurbishment - calculation of emissions and primary energy -> Section B.1 - Building and City Quarter Simulation: Demand and Supply Simulation |
| ***12*** | *Germany* | *4ClimateFuture Direct Air capture and Storage onshore Germany* | Business and Innovation Service: access to finance (INNOVFUND-2022-LSC)<br>Business and Innovation Service: (less desired) Networking → connections to authorities and other stakeholders (civil society) |

| No. | Regional Hub | Project | Needs Identified |
|---|---|---|---|
| **13** | Germany | Energetic inventory and potentials of municipal properties of the city of Oestrich-Winkel | Technical Needs:<br>1. Section B.1 - Building and City Quarter Simulation: Demand and Supply Simulation/ Section<br>2. B.1 - Building and City Quarter Simulation - Renewable Energy Potential Assessment<br>3. Energy and environmental monitoring (but first the need one has to be satisfied) |
| **14** | Germany | SPEED-UP-ENERGY-TRANSITION KORBACH (SET-KORBACH) | Technical Service: Data and transition potentials and their prioritization, action plan (heating and cooling)<br>Business and Innovation Service: Networking<br>Business and Innovation Service: Communication process with policy makers and stakeholders |
| **15** | Germany | Green Hydrogen for heating in Wiesbaden | Business and Innovation Need:<br>1. Business Model with Hydrogen project (develop tool how to calculate something? potentially?) -> to get concretely into doing.<br>2. Access to finance support: EU-Funding<br>3. Transformation of the heat supply |
| **16** | Germany | Simulation of renewable energy potentials and promotion of renewable energies in electricity and heat supply in private households and municipal properties in Oststeinbek (DE) | Technical Service: Simulation of Renewable Energy Potential Building and City Quarter Simulation<br>Business and Innovation Service:<br>1. Networking with Energy Communities<br>2. Access to finance |
| **17** | Germany | H2MC.Heating | Technical Service: Energy Performance Auditing and Certification<br>Business and Innovation Service: European Funding Opportunities 3. Business and Innovation Service: Networking |

| No. | Regional Hub | Project | Needs Identified |
|---|---|---|---|
| **18** | Germany | Orosi AI | Intro to angel investors and VCs<br>2. EU funding programmes |
| **19** | Greece | Energy Community of Karditsa (ESEK) | In need of an environmental business modelling align with the national legislative landscape |
| **20** | Greece | Energy Inspection and Upgrade of Buildings (Petsas) | In need of a market research focusing on the Greek framework conditions |
| **21** | Greece | Energy Inspection and Upgrade of Buildings (Tzimpas & Panagiotopoulou) | In need of a business planning with focus on the Greek market |
| **22** | Greece | Citizens' energy cooperative: Attica Energy Community is growing! | In need of Networking services, to enhance their communications strategy and the RESCoop to develop further its network |
| **23** | Greece | RESUB – RES for urban buildings – An innovative cloud-based platform that enables multi-scale RES integration analysis towards cities' decarbonisation | In need of a technical service focusing on the assessment of the thermal demands of buildings based on their surface and framework characteristics from GIS as well as the potential of RES integration |

| No. | Regional Hub | Project | Needs Identified |
|---|---|---|---|
| **24** | Greece | Advanced catalytic processes for the upgrading of heavy bio-, waste-and fossil-derived liquids to high-quality products. | In need of a business mentoring align with the national developments, legislative and framework conditions |
| **25** | Italy | Levante – energy anywhere | Life Cycle Assessment (LCA) Analysis --> Section B.2 - Environmental Impact Assessment As agreed with HFT during the first round of services delivered, they can continue the work started few months ago |
| **26** | Italy | GREEN DUCT | Project pilot implementation - Advice for pilot project implementation: Section B.3 - Advice for pilot project implementation<br>Business plan + marketing plan |
| **27** | Norway | Integrated RES solutions for heating for the refugee community - IRES | Access to finance support<br>Business Planning |
| **28** | Norway | ECO-MIDAS - From Waste to Heat | Business Planning<br>Access to finance support |
| **29** | Norway | Virtual Energy District/ TASK4M | Access to finance support<br>Business Planning |
| **30** | Slovakia | Planning and capacity building for a successful heat supply transformation. | Transfer of knowledge on heat supply transformation planning in the cities above 15 000 people in German state Baden Wurttemberg (to learn how it is done and how it could be applied to Slovak cities), with possible application to a concrete Slovakian city. |

## 6.3 Annex III: RES and Technologies considered in supported projects

| First / second round | No. | Project | Regional Hub | Technical /business service? | Types of RES* | Technologies* | Chosen Partner |
|---|---|---|---|---|---|---|---|
| **1st** | 1.1 | Energy Neutrality - EN@homes | BG | Business | Most prominent: solar, ambient | PV, solar thermal, heat pumps | EAP |
| **1st** | 1.2 | Networking and cooperation of settlements by improving and linking buildings as well as introducing intelligent supply mains and renewable energies | DE | Technical | Solar, ambient, geothermal | PV, solar thermal, heat pumps, geothermal plant, sewage heat pump, (refurbishment) | HFT |
| **1st** | 1.3 | Strengthening women in the “National network for energy consultants in Germany” (GIH) for concrete activities like “Individual renewable renovation roadmap as a holistic consulting tool” for developers, housing companies and private owners. | DE | Business | None | None | WECF |
| **1st** | 1.4 | Energifællesskab Avedøre Financing Initiative | DK | Technical | None | (CO2-friendly mobility (e-bikes)) | EGC |
| **1st** | 1.6 | Energifaellesskab Hoje Taastrup | DK | Technical | None | None | EGC |
| **1st** | 1.7 | High5Girls | DK | Business | None | None | S2i |
| **1st** | 1.8 | UIA World Congress 2023 in Copenhagen | DK | Business | None | (Goal: first carbon free congress) | EGC |
| **1st** | 1.9 | AST-SMART | GR | Business | Most prominent: solar, ambient | PV, solar thermal, heat pumps -> goal: decarbonisation of cities | EAP |

| First / second round | No. | Project | Regional Hub | Technical /business service? | Types of RES* | Technologies* | Chosen Partner |
|---|---|---|---|---|---|---|---|
| **1st** | 1.10 | Citizens' energy cooperative: Attica Energy Community | GR | Business | Solar | PV | Q-PLAN |
| **1st** | 1.11 | Energy Community WENCoop. | GR | Business | solar | PV | Q-PLAN |
| **1st** | 1.12 | Kafsimo | GR | Business | waste/biomass | converting ogranic waste from coffee production/consumption into bioenergy | PEDAL |
| **1st** | 1.13 | COLD CAS2E | IT | Business | Access energy (solar) | studies novel high emissivity materials leading to energy efficiency by use of renewable energy in the field of solar exploitation and in refractory & metal production. | WR |
| **1st** | 1.14 | Development and demonstration of an integrated and modular solar-driven residential energy system | IT | Business | Solar | PV, solar thermal | CIVI |
| **1st** | 1.15 | DIVINE CITY | IT | Business | Access energy (mostly: solar,wind) | electric boiler | APRE |
| **1st** | 1.16 | LEVANTE - energy anywhere | IT | Technical | solar | PV | HFT |
| **1st** | 1.17 | Development of mortars | IT | Business | none | (developement of phase-changing mortars for higher efficiency in buildings) | S2i |
| **1st** | 1.18 | HEROES | IT | Business | solar | new solar driven co-generation unit for heat and electricity | APRE |
| **1st** | 1.19 | NOCOTÚ: A NEW WAY OF LIVING, FOR THE FUTURE OF OUR PLANET | IT | Business | (waste - reusing old shipping containers) | | S2i |

| First / second round | No. | Project | Regional Hub | Technical /business service? | Types of RES* | Technologies* | Chosen Partner |
|---|---|---|---|---|---|---|---|
| **1st** | 1.20 | SMYLE | IT | Business | solar | Concentrating solar plant (CSP) system | APRE |
| **1st** | 1.21 | WOMEN WANTING WOOL | IT | Business | none | none | WR |
| **1st** | 1.22 | Adiabatic cooling - Cooling by evaporation of water | SK | Business | ambient | evaporation units | PEDAL |
| **1st** | 1.23 | ECOcommunity center BÚDA - 4women4sustainability | SK | Business | most prominent: solar, ambient | PV, solar thermal, heat pumps | PEDAL |
| **1st** | 1.24 | Feasibility study of waste thermal energy recuperation | SK | Business | ambient, waste, | heat recovery units from waste water and wast ventilation | PEDAL |
| **1st** | 1.25 | GreenIZOLA | SK | Technical | solar | PV | HFT |
| **1st** | 1.26 | A community energy source in the circular suburban villages | SK | Technical | solar, wind, ambient | PV, solar thermal, wind turbines, heat pumps | EAP |
| **1st** | 1.27 | 4TH GENERATION DISTRICT HEATING SYSTEM IN UPPER NITRA REGION – THE ASSESSMENT OF THE PREFEASIBILITY STUDY | SK | Technical | solar, geothermal, ambient | PV, solar thermal, heat pumps, geothermal heat pump | HFT |
| **2nd** | 2.1 | Second green life of wind turbine blades | BE | Business | Wind | Wind turbines | WR |
| **2nd** | 2.2 | Biovalorization of winery industry waste to produce value-added products. Production of anthocyanins from by-product of winery industry | BG | Business | Biomass (winery waste) | (Valorization ob winery by-products) | EAP |
| **2nd** | 2.3 | Recovery of phosphorus from dewatered sewage sludge | BG | Business | Waste (sewage sludge) | recovering phosphorus | EAP |
| **2nd** | 2.4 | Scenarios development for heating and cooling sector in the context of decarbonisation | BG | Technical | Solar, geothermal, ambient | PV, solar thermal panel, geothermal plant, heat humps | EAP |

| First / second round | No. | Project | Regional Hub | Technical /business service? | Types of RES* | Technologies* | Chosen Partner |
|---|---|---|---|---|---|---|---|
| **2nd** | 2.5 | Technologies for production of solid biofuels from organic waste | BG | Technical | Waste, biomass - biofuels | Hydrothermal carbonization (HTC), pyrolysis, firing, briquetting and pelletizing | EAP |
| **2nd** | 2.6 | ZOYO Card – digital business cards | BG | Business | None | Digitalization (of business cards) | S2i |
| **2nd** | 2.7 | Building Photovoltaic park on the roof of the National Trade and Banking High School – Sofia, Bulgaria | BG | Technical | Solar | PV | HFT |
| **2nd** | 2.8 | Action Energy Finance Oy | DK | Business | Most prominent: solar, ambient | Digitalization: Software for a marketplace: matchmaking between service/energy providers and buyers to facilitate (refurbishment) and small scale projects related to renewable energy production (PV, heat pumps, etc.) | WR |
| **2nd** | 2.9 | UIA World Congress 2023 in Copenhagen Communication Booster | DK | Business | All RES on a general level, most prominent: solar, geothermal, ambient, biomass | most prominent: PV, solar thermal panel, geothermal plants, heat humps, technologies producing biofuels | APRE |
| **2nd** | 2.10 | High5Girls | DK | Business | Most prominent: solar, wind | girls learn about and build PV, wind turbines | ECWT |
| **2nd** | 2.11 | Networking and cooperation of settlements by improving and linking buildings as well as introducing intelligent supply mains and renewable energies. | DE | Technical | Solar, geothermal, ambient | PV, heat pumps, (refurbishment) | HFT |
| **2nd** | 2.12 | 4ClimateFuture Direct Air capture and Storage onshore Germany | DE | Business | None | Carbon capture and storing (CCS) | S2i |
| **2nd** | 2.13 | Energetic inventory and potentials of municipal properties of the city of Oestrich-Winkel | DE | Technical | Solar, ambient | PV, heat pumps, (refurbishment) | HFT |

| First / second round | No. | Project | Regional Hub | Technical /business service? | Types of RES* | Technologies* | Chosen Partner |
|---|---|---|---|---|---|---|---|
| **2nd** | 2.14 | Speed-up-energy-transition Korbach (SET-KORBACH) | DE | Technical | Solar | PV, (refurbishment) | HFT |
| **2nd** | 2.15 | Green Hydrogen for heating in Wiesbaden | DE | Business | Access energy from different renewables mainly solar and wind | Hydrogen-Electrolysis (Hydrogen is an energy carrier, not an energy source) | S2i |
| **2nd** | 2.16 | Simulation of renewable energy potentials and promotion of renewable energies in electricity and heat supply in private households and municipal properties in Oststeinbek (DE) | DE | Technical | Solar | PV | HFT |
| **2nd** | 2.17 | H2MC.Heating | DE | Business | Access energy from different renewables mainly solar and wind | Transformer to use Hydrogen in conventional district heating | S2i |
| **2nd** | 2.18 | Orosi AI | DE | Business | None | Digitalization in form of AI & BIM for efficient mechanical, electrical plumbing (MEP) planning | S2i |
| **2nd** | 2.20 | Energy Community of Karditsa (ESEK) | GR | Business | waste / biomass (solid biofuels): urban pruning, coffee residues, forest residues | Pellets combustion | Q-PLAN |
| **2nd** | 2.21 | Energy Inspection and Upgrade of Buildings (Petsas) | GR | Business | Solar, ambient | PV, heat pumps | Q-PLAN |
| **2nd** | 2.22 | Energy Inspection and Upgrade of Buildings (Tzimpas & Panagiotopoulou) | GR | Business | Solar, ambient | PV, heat pumps | Q-PLAN |
| **2nd** | 2.23 | Citizens' energy cooperative: Attica Energy Community is growing! | GR | Business | Solar | PV | APRE |

| First / second round | No. | Project | Regional Hub | Technical /business service? | Types of RES* | Technologies* | Chosen Partner |
|---|---|---|---|---|---|---|---|
| **2nd** | 2.24 | RESUB – RES for urban buildings – An innovative cloud-based platform that enables multi-scale RES integration analysis towards cities' decarbonization | GR | Technical | Solar | PV | HFT |
| **2nd** | 2.25 | Advanced catalytic processes for the upgrading of heavy bio-, waste-and fossil-derived liquids to high-quality products. | GR | Business | Biomass | Biofuels through catalytic pyrolysis | Q-PLAN |
| **2nd** | 2.26 | Levante – energy anywhere | IT | Technical | Solar | PV | HFT |
| **2nd** | 2.27 | GREEN DUCT | IT | Technical | Solar, ambient | Patented new passive cooling device with solar tub using a small greenhouse effect | CIVI |
| **2nd** | 2.29 | Integrated RES solutions for heating for the refugee community - IRES | NO | Business | Solar, wind | Innovative Heating Solution using PV, wind turbines, batteries | ECWT |
| **2nd** | 2.30 | ECO-MIDAS - From Waste to Heat | NO | Business | Biomass | Biomass pellets production, concept for sustainable biomass material flow during processing | ECWT / APRE |
| **2nd** | 2.33 | Virtual Energy District/ TASK4M | NO | Business | Solar | PV | APRE |
| **2nd** | 2.35 | Planning and capacity building for a successful heat supply transformation. | SK | Technical | Solar, geothermal | (District heating), geothermal heat pump, solar thermal panels | HFT |

## 6.4 Annex IV: Evaluation of environmental impact KPI-7

| First / second round | No. | Project | Regional Hub | Criterion 1 locality | Criterion 2 No. of environmental dimensions | Criterion 2 Environmental dimensions | Criterion 3 indirect / direct | Description of impact | Total EI score |
|---|---|---|---|---|---|---|---|---|---|
| **1st** | 1.1 | Energy Neutrality - EN@homes | BG | 2 | 1 | climate | 0 | Promoting know-how and concepts for energy efficient and RES technology investment in households, private buildings or city quarters via self-investment or via “energy cooperatives” | 3 |
| **1st** | 1.2 | Networking and cooperation of settlements by improving and linking buildings as well as introducing intelligent supply mains and renewable energies | DE | 1 | 1 | climate | 1 | Information about renewable energy potential + refurbishment potential -> incentive for implementing measures and saving CO2 emissions in electricity and heat sector | 3 |
| **1st** | 1.3 | Strengthening women in the “National network for energy consultants in Germany” (GIH) for concrete activities like “Individual renewable renovation roadmap as a holistic consulting tool” for developers, housing companies and private owners. | DE | 3 | 1 | climate | 0 | The GIH is a network connecting several energy consultants throughout Germany. It informs the public about ongoing energy consultancy projects and energy efficiency. It also aims for exchange and collaboration between female energy consultants shall be strengthened on a long-term basis, e.g., by providing specific technical trainings for the installation of heat pumps. | 4 |
| **1st** | 1.4 | Energifællesskab Avedøre Financing Initiative | DK | 1 | 1 | climate | 1 | implementing a mobility solution based on renewable energy (electric bike system) saves´Co2 emissions | 3 |
| **1st** | 1.6 | Energifaellesskab Hoje Taastrup | DK | 1 | 1 | climate | 0 | trying to be part of the new European Bauhaus, aims at enriching art and culture, creating sustainable future (nature, environment and plant) and including dialogue across cultures, disciplines, genders and ages | 2 |

| First / second round | No. | Project | Regional Hub | Criterion 1 locality | Criterion 2 No. of environmental dimensions | Criterion 2 Environmental dimensions | Criterion 3 indirect / direct | Description of impact | Total EI score |
|---|---|---|---|---|---|---|---|---|---|
| **1st** | 1.7 | High5Girls | DK | 3 | 1 | climate | 0 | High FIVE Girls is a platform with the goal of exciting and empowering girls with knowledge and confidence in STEM and entrepreneurship so that they can become future problem solvers and leaders, | 4 |
| **1st** | 1.8 | UIA World Congress 2023 in Copenhagen | DK | 4 | 10 | targets all SDGs | 0 | The congress has a theme of 'Sustainable Futures – Leave No One Behind' and aims to be the first carbon neutral UIA Congress. Through the congress and accompanying study tours, UIA2023CPH aims to improve participants knowledge and ability to actively use the SDGs, especially as it relates to architecture and the built world. | 14 |
| **1st** | 1.9 | AST-SMART | GR | 3 | 1 | climate | 0 | AST-Smart project focuses on the development of an integrated mitigation and adaptation planning platform towards urban decarbonization. | 4 |
| **1st** | 1.10 | Citizens' energy cooperative: Attica Energy Community | GR | 1 | 1 | climate | 1 | Estimation on the CO2 savings from the implementation of their project which is the installation of 100 kW solar roof panels. Annual CO2 savings were considered as environmental benefits in their sustainable business model. | 3 |
| **1st** | 1.11 | Energy Community WENCoop. | GR | 1 | 1 | climate | 1 | Estimation on the CO2 savings from the implementation of their project which is the installation of 1 MW solar panels. Annual CO2 savings were considered as environmental benefits in their sustainable business model. | 3 |

| First / second round | No. | Project | Regional Hub | Criterion 1 locality | Criterion 2 No. of environmental dimensions | Criterion 2 Environmental dimensions | Criterion 3 indirect / direct | Description of impact | Total EI score |
|---|---|---|---|---|---|---|---|---|---|
| **1st** | 1.12 | Kafsimo | GR | 3 | 2 | climate, soil | 0 | aims to change behaviour for the reduction of carbon footprint, fight climate change and promote inclusion through coffee recycling. Its specific objectives are (1) to facilitate mentality change through praxis, and (2) to test and prove a low-emissions logistics system for organic waste management. | 5 |
| **1st** | 1.13 | COLD CAS2E | IT | 3 | 1 | climate | 1 | COLD CAS2E studies novel high emissivity materials leading to energy efficiency by use of renewable energy in the field of solar exploitation and in refractory & metal production. | 5 |
| 1st | 1.14 | Development and demonstration of an integrated and modular solar-driven residential energy system | IT | 3 | 1 | climate | 1 | developing an integrated and modular solar-driven residential energy system designed for combined heat, cold and electricity production is an Italian project that aims to design, develop, and demonstrate an economically efficient and sustainable concept of solar-driven system for supplying heat, cold and electricity for domestic and e-mobility purposes in the residential sector (new and existing buildings). | 5 |
| **1st** | 1.15 | DIVINE CITY | IT | 3 | 2 | climate, air | 1 | The development of sustainable cities is now a reality. All individuals and companies can contribute, thanks to electro-ionic storage combined with photovoltaic systems. This could reduce pollution and additionally reduce costs. The heat generator that they market is efficient, it does not burn fuels, it does not emit any type of substances into the atmosphere and optimizes the use of energy generated by photovoltaic and solar thermal systems. | 6 |

| First / second round | No. | Project | Regional Hub | Criterion 1 locality | Criterion 2 No. of environmental dimensions | Criterion 2 Environmental dimensions | Criterion 3 indirect / direct | Description of impact | Total EI score |
|---|---|---|---|---|---|---|---|---|---|
| **1st** | 1.16 | LEVANTE - energy anywhere | IT | 4 | 1 | climate | 1 | saving CO2 emissions by providing a sustainable PV-panel that has multi-usages | 6 |
| **1st** | 1.17 | Development of mortars | IT | 3 | 1 | climate | 1 | aims to develop mortars that are based on different binders which contain an original sustainable Phase Change Material (PCM) and are able to improve the energy efficiency of buildings. In identifying different binder compositions, the project is developing mortars with the PCM that can eventually be used in a wide range of applications, from modern buildings to antique constructions. | 5 |
| **1st** | 1.18 | HEROES | IT | 3 | 1 | climate | 1 | decarbonizing the buildings sector proposing a brand new and potentially disruptive solar technology for the co-generation of heat and electricity for all types of buildings by integrating novel smart materials and temperature chaining concepts into a single system, offering 24/7 undisrupted supply of heat and power. | 5 |
| **1st** | 1.19 | NOCOTÚ: A NEW WAY OF LIVING, FOR THE FUTURE OF OUR PLANET | IT | 3 | 1 | climate | 0 | NOCOTÙ is a housing solution that, through the reuse and reconditioning of used shipping containers, promotes sustainable construction with less impact on the environment and household costs. The project has developed an IoT technology that aims at addressing not only the environmental impact of current space heating and cooling systems, but also the economic impact these systems have on households. | 4 |

| First / second round | No. | Project | Regional Hub | Criterion 1 locality | Criterion 2 No. of environmental dimensions | Criterion 2 Environmental dimensions | Criterion 3 indirect / direct | Description of impact | Total EI score |
|---|---|---|---|---|---|---|---|---|---|
| **1st** | 1.20 | SMYLE | IT | 4 | 1 | climate | 1 | proposes a ground-breaking approach exploiting sunlight to generate electric power and heat from concentrated solar energy by integrating novel smart materials and novel technologies into a single system. The SMYLE solar plant promises +50% electrical efficiency with respect to existing systems, higher operational flexibility and lower environmental footprint. | 6 |
| **1st** | 1.21 | WOMEN WANTING WOOL | IT | 4 | 4 | climate, biodiversity, land, soil | 1 | aiming towards building a sustainable vision for the wool value chain, including its applications related to energy efficiency in the construction sector. | 9 |
| **1st** | 1.22 | Adiabatic cooling - Cooling by evaporation of water | SK | 3 | 1 | climate | 1 | produces cold efficiently with a minimum carbon footprint. Huge electricity savings have a direct impact on environment. Every evaporation unit that the customer prefers a over standard air conditioning is a win for both the user and nature. | 5 |
| **1st** | 1.23 | ECOcommunity center BÚDA - 4women4sustainability | SK | 2 | 2 | climate, population and human health | 0 | The center will be dedicated to community and sustainable development, environmental education, advocacy for social and cultural change, as well as the climate crisis and its negative impacts. The building itself will serve as a showcase example of a sustainable building for future educational activities about benefits and possibilities to apply RHC solutions. | 4 |
| **1st** | 1.24 | Feasibility study of waste thermal energy recuperation | SK | 3 | 2 | climate, water | 1 | combines knowledge and experience in the field of energy, heating, construction and building reconstruction. The company develops and manufactures equipment for heat recovery from waste water and waste ventilation of buildings. | 6 |

| First / second round | No. | Project | Regional Hub | Criterion 1 locality | Criterion 2 No. of environmental dimensions | Criterion 2 Environmental dimensions | Criterion 3 indirect / direct | Description of impact | Total EI score |
|---|---|---|---|---|---|---|---|---|---|
| **1st** | 1.25 | GreenIZOLA | SK | 1 | 2 | climate, biodiversity | 1 | deals with the effects of green roofs on indoor comfort, microclimate, etc. As case study serves a mixed usage building in Kosice, Slovakia. This building was equipped in 2017 with numerous monitoring equipment and with various green roof options. The aim of this project was to find out which type of green roof has the greatest effect on the cooling of the city. Another effect of green roofs is the change in the U-value of the roof. | 4 |
| **1st** | 1.26 | A community energy source in the circular suburban villages | SK | 1 | 1 | climate | 1 | aims towards 'a community energy source in the circular suburban villages' is to create a community energy source which will cover basic needs for houses and flats such as appliances connection, heating, cooling, and DHW by designing a complex system that will use energy from RES, from solar panels and wind turbines. | 3 |
| **1st** | 1.27 | 4th Generation District Heating System in Upper Nitra Region – The Assessment of the Prefeasibility Study | SK | 2 | 1 | climate | 1 | working on implementing a carbon-neutral district heating network in Prievidza by 2030. | 4 |
| **2nd** | 2.1 | Second green life of wind turbine blades | BE | 4 | 3 | land, soil, climate | 0 | focuses on the reduction of pollution and cutting the cost of the recycling process of wind turbine blades by turning them into useful products. The reduction of environmental impact will be achieved by reducing the area of land allocated for storage of waste blades and reducing the pressure on the habitation of animals. The cost of the disposal process will also be significantly reduced due to the absence of the need to buy and use expensive equipment and lower energy consumption. | 7 |

| First / second round | No. | Project | Regional Hub | Criterion 1 locality | Criterion 2 No. of environmental dimensions | Criterion 2 Environmental dimensions | Criterion 3 indirect / direct | Description of impact | Total EI score |
|---|---|---|---|---|---|---|---|---|---|
| **2nd** | 2.2 | Biovalorization of winery industry waste to produce value-added products. Production of anthocyanins from by-product of winery industry | BG | 4 | 4 | land, soil, water, climate | 0 | transforming he by-products and residue from wine making to products themselves saving energy, waste and waste water | 8 |
| **2nd** | 2.3 | Recovery of phosphorus from dewatered sewage sludge | BG | 4 | 4 | land, soil, biodiversity, climate | 0 | Phosphorus causes eutrophication but is an important nutrient element. Development of a technology for phosphorus recovery from dewatered sewage sludge | 8 |
| **2nd** | 2.4 | Scenarios development for heating and cooling sector in the context of decarbonisation | BG | 2 | 6 | climate, biodiversity, land, soil, water, air | 0 | examines transition pathways of the heating and cooling subsector. | 8 |
| **2nd** | 2.5 | Technologies for production of solid biofuels from organic waste | BG | 3 | 2 | climate, land | 1 | examining technologies for the production of solid biofuels from organic waste | 6 |
| **2nd** | 2.6 | ZOYO Card – digital business cards | BG | 4 | 2 | climate, land | 0 | provides a unique, and innovative solution for improving the traditional process of networking and sharing contact information ZOYO Card offers digital business cards, which are an environmentally friendly alternative to the paper business cards | 6 |
| **2nd** | 2.7 | Building Photovoltaic Park on the Roof of the National Trade and Banking High School – Sofia, Bulgaria | BG | 1 | 1 | climate | 1 | analyses PV-potential for National Trade and Banking School in Sofia with economic estimation | 3 |

| **First / second round** | No. | Project | **Regional Hub** | Criterion 1 **locality** | Criterion 2 **No. of environmental dimensions** | Criterion 2 **Environmental dimensions** | Criterion 3 **indirect / direct** | Description of impact | Total EI score |
|---|---|---|---|---|---|---|---|---|---|
| **2nd** | 2.8 | Action Energy Finance Oy | DK | 3 | 1 | climate | 0 | helping housing associations in the energy buying process, developing a platform that helps property managers to handle small scale energy-projects, bringing a digital solution to the market that significantly improves the buying process and financing of small energy-projects | 4 |
| **2nd** | 2.9 | UIA World Congress 2023 in Copenhagen Communication Booster | DK | 4 | 10 | targets all SDGs | 0 | The congress has a theme of 'Sustainable Futures – Leave No One Behind' and aims to be the first carbon neutral UIA Congress. Through the congress and accompanying study tours, UIA2023CPH aims to improve participants knowledge and ability to actively use the SDGs, especially as it relates to architecture and the built world. | 14 |
| **2nd** | 2.10 | High5Girls | DK | 3 | 1 | climate | 0 | High FIVE Girls is a platform with the goal of exciting and empowering girls with knowledge and confidence in STEM and entrepreneurship so that they can become future problem solvers and leaders, | 4 |
| **2nd** | 2.11 | Networking and cooperation of settlements by improving and linking buildings as well as introducing intelligent supply mains and renewable energies. | DE | 1 | 1 | climate | 1 | analyzing energetic status of settlements. Development of future energy supply scenarios including refurbishment strategies | 3 |

| First / second round | No. | Project | Regional Hub | Criterion 1 locality | Criterion 2 No. of environmental dimensions | Criterion 2 Environmental dimensions | Criterion 3 indirect / direct | Description of impact | Total EI score |
|---|---|---|---|---|---|---|---|---|---|
| **2nd** | 2.12 | 4ClimateFuture Direct Air capture and Storage onshore Germany | DE | 3 | 2 | climate, air | 1 | wants to create an opportunity with a technical pilot (direct Air Capture with CCS) onshore Germany. The production of CO2 intensive materials such as cement and steel, on the other hand, is essential for a climate friendly energy supply through wind turbines and geothermal energy. Moreover, removing CO2 from the atmosphere is another fundamental step in the fight against climate change. | 6 |
| **2nd** | 2.13 | Energetic inventory and potentials of municipal properties of the city of Oestrich-Winkel | DE | 2 | 1 | climate | 1 | analyzing energetic status of settlements. Development of future energy supply scenarios including refurbishment strategies | 4 |
| **2nd** | 2.14 | SPEED-UP-ENERGY-TRANSITION KORBACH (SET-KORBACH) | DE | 2 | 1 | climate | 1 | analyzing energetic status of settlements. Development of future energy supply scenarios including refurbishment strategies | 4 |
| **2nd** | 2.15 | Green Hydrogen for heating in Wiesbaden | DE | 2 | 1 | climate | 1 | Green Hydrogen Wiesbaden wants to discover opportunities to use hydrogen in the future the first plan was to install an electrolysis which is run by green electricity to produce green hydrogen and feed the hydrogen in the local gas network | 4 |
| **2nd** | 2.16 | Simulation of renewable energy potentials and promotion of renewable energies in electricity and heat supply in private households and municipal properties in Oststeinbek (DE) | DE | 2 | 1 | climate | 1 | analyzing energetic status of settlements. Development of future energy supply scenarios including refurbishment strategies | 4 |

| First / second round | No. | Project | Regional Hub | Criterion 1 locality | Criterion 2 No. of environmental dimensions | Criterion 2 Environmental dimensions | Criterion 3 indirect / direct | Description of impact | Total EI score |
|---|---|---|---|---|---|---|---|---|---|
| **2nd** | 2.17 | H2MC.Heating | DE | 4 | 1 | climate | 0 | The use of hydrogen as a fuel produces only water vapor and heat as emissions The H 2 mc Heating UG heating unit and process are the subject of a German patent (DE 10 2022 116 119 B 3). attractive option especially for the renovation of old buildings with poor energy efficiency classes, as the heating unit can be installed without major conversion work. | 5 |
| **2nd** | 2.18 | Orosi AI | DE | 3 | 1 | climate | 0 | generates collision free, completely norm conform, and energy efficient MEP (=Mechanical, electrical, and plumbing) design suggestions. Instead of months, our plans take only minutes. Enables the customers to optimize for environmental impact on a scale unachievable by human planners | 4 |
| **2nd** | 2.20 | Energy Community of Karditsa (ESEK) | GR | 1 | 1 | climate | 0 | An environmental modelling has been applied here in order to design an environmental protection plan for the region of Karditsa in Greece. The particular plan assesses the environmental impact of the region and suggests actions for improvement. Utilizing local biomass | 2 |
| **2nd** | 2.21 | Energy Inspection and Upgrade of Buildings (Petsas) | GR | 1 | 1 | climate | 1 | Calculation on the CO2 emissions through the energy upgrade of a prototype building. The energy savings concern the installation of RHC units and the proper insulation. For the calculation of both the energy savings and the CO2 emissions a specific Greek software was used. (TEE KENAK). The results were used to their sustainable business model as environmental benefits. | 3 |

| First / second round | No. | Project | Regional Hub | Criterion 1 locality | Criterion 2 No. of environmental dimensions | Criterion 2 Environmental dimensions | Criterion 3 indirect / direct | Description of impact | Total EI score |
|---|---|---|---|---|---|---|---|---|---|
| **2nd** | 2.22 | Energy Inspection and Upgrade of Buildings (Tzimpas & Panagiotopoulou) | GR | 1 | 1 | climate | 1 | Calculation on the CO2 emissions through the energy upgrade of a prototype building. The energy savings concern the installation of RHC units and the proper insulation. For the calculation of both the energy savings and the CO2 emissions a specific Greek software was used. (TEE KENAK). The results were used to their sustainable business model as environmental benefits. | 3 |
| **2nd** | 2.23 | Citizens' energy cooperative: Attica Energy Community is growing! | GR | 1 | 1 | climate | 0 | aiming to support citizens of Attica to fight energy poverty, in a sustainable and fair way. We plan to co-produce and share the energy that our photovoltaic park will produce. | 2 |
| **2nd** | 2.24 | RESUB – RES for urban buildings – An innovative cloud based platform that enables multi-scale RES integration analysis towards cities' decarbonization | GR | 3 | 1 | climate | 0 | developing a platform for analyzing the building stock energetically. Aims towards the decarbonization of cites. | 4 |
| **2nd** | 2.25 | Advanced catalytic processes for the upgrading of heavy bio-, waste-and fossil-derived liquids to high-quality products. | GR | 2 | 3 | climate, soil, land | 0 | utilization of processes for upgrading heavy bio-, waste-and fossil-derived liquids to high-quality products. Contributing to reduction of GHG emissions by increasing the use of the renewable energy source (biomass), reducing contamination by applying a sustainable waste management system | 5 |
| **2nd** | 2.26 | Levante – energy anywhere | IT | 4 | 1 | climate | 1 | saving CO2 emissions by providing a sustainable PV-panel that has multi-usages | 6 |

| First / second round | No. | Project | Regional Hub | Criterion 1 locality | Criterion 2 No. of environmental dimensions | Criterion 2 Environmental dimensions | Criterion 3 indirect / direct | Description of impact | Total EI score |
|---|---|---|---|---|---|---|---|---|---|
| **2nd** | 2.27 | GREEN DUCT | IT | 3 | 1 | climate | 1 | a patented device for smart passive cooling in interiors. The product has a preferred application in historic buildings: the innovative system presents a low material impact and a reversible installation for the protection of architectural and landscape values and the view of the cultural heritage as a whole system (environment-architecture-users-plants). | 5 |
| **2nd** | 2.29 | Integrated RES solutions for heating for the refugee community - IRES | NO | 3 | 2 | climate, population and human health | 0 | further develop the concept and prototype an integrated heating and cooling solution addressing the specific and urgent needs of the female Ukrainian refugees located in Dobczyce, Poland focusing on RES technologies, test and evaluate the solution with set of recommendations for scalability and replication within 6 months | 5 |
| **2nd** | 2.30 | ECO-MIDAS - From Waste to Heat | NO | 2 | 2 | climate, population and human health | 1 | using biomass in the Region of Gdansk and other cities instead of coal and gas, drafting collections systems, compress and shred biomass, transport it to the user | 5 |
| **2nd** | 2.33 | Virtual Energy District/ TASK4M | NO | 4 | 1 | climate | 0 | creating a Virtual Energy district / Innovative Marketplace for surplus electricity in the Poland and Norway | 5 |
| **2nd** | 2.35 | Planning and capacity building for a successful heat supply transformation. | SK | 2 | 1 | climate | 1 | working on implementing a carbon-neutral district heating network in Partizanske by 2030. | 4 |

## 6.5 Annex V: Results of Evaluation Survey – Comparison of First and Second Round

| First Round: 19 participants | All | | Business | | Technical | |
|---|---|---|---|---|---|---|
| **Questions** | **Average points** | **%** | **Average points** | **%** | **Average points** | **%** |
| Did you receive a consulting service?<br><br>If yes, then: What was **the progress made in the development of your project** thanks to the W4RES support services? | **3,94** | **79%** | **3,91** | **78%** | **4,00** | **80%** |
| Did you gain access to results?<br><br>If yes, then: What was the progress made in the development of your project thanks to the W4RES access to results / information / knowledge? | **3,73** | **75%** | **3,67** | **73%** | **3,83** | **77%** |
| Second Round: 22 participants | **All** | | **Business** | | **Technical** | |
| **Questions** | **Average points** | **%** | **Average points** | **%** | **Average points** | **%** |
| Did you receive a consulting service?<br><br>If yes, then: What was **the progress made in the development of your project** thanks to the W4RES support services? | **4,32** | **86%** | **4,09** | **82%** | **4,55** | **91%** |
| Did you gain access to results?<br><br>If yes, then: What was the progress made in the development of your project thanks to the W4RES access to results / information / knowledge? | **4,23** | **85%** | **4,09** | **82%** | **4,36** | **87%** |

| Average of first and second round: in total 41 participants | All | | Business | | Technical | |
|---|---|---|---|---|---|---|
| **Questions** | **Average points** | **%** | **Average points** | **%** | **Average points** | **%** |
| Did you receive a consulting service?<br><br>If yes, then: What was **the progress made in the development of your project** thanks to the W4RES support services? | **4,13** | **83%** | **4,00** | **80%** | **4,28** | **86%** |
| Did you gain access to results?<br><br>If yes, then: What was the progress made in the development of your project thanks to the W4RES access to results / information / knowledge? | 3,98 | **80%** | **3,88** | **78%** | **4,10** | **82%** |

Participants could choose on a scale of 0 to 5, with 0 representing 0% progress and 5 representing 100% progress on their project development.