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## Deliverable D8.8

# Third Report on implementation of Training, Education and Dissemination activities M25-M36

### WP8 – T8.1

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Lead beneficiary	RGS - Romanian Geoexchange Society (Romania)
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#### Dissemination Level

PU	Public	X
CO	Confidential, only for members of the consortium (including the Commission Services)	
CI	Classified, as referred to in Commission Decision 2001/844/EC	

**Document History**

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REV 1-AB	24/03/2021	Adriana Bernardi (Coordinator)	Commented / corrected / completed version
REV 2 FINAL	25/03/2021	Doina Cucueteanu (RGS responsible)	Creation of the final document
REV 2 FINAL	31/03/2021	Adriana Bernardi (Coordinator)	Final version uploaded in the EU portal

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This document was verified by the project Coordinator and was not submitted to an internal review because:

- (a) its format was subject of a preliminary / initial debate in the Consortium with the occasion of the approval of the TED Strategy and the TED Plan already reported to EC – EASME in M6,
- (b) its content is a synthesis of all partners own reports / inputs covering M25-M36.

The revision uploaded in EU – EASME in the REV FINAL file exactly includes all the corrections, observations and suggestions made by the Coordinator.

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## Publishable summary

The *GEO4CIVHIC D8.8 Third report on implementation of TED activities* is a public document delivered in the context of **WP8, Task 8.1 – Development of the Training, Education and Dissemination Plan** being an yearly report that must be delivered in M36 (March 31<sup>st</sup>, 2021).

This document has the purpose to inform about the progress in the implementation of the actions included in TED Plan in the third year of the project namely in M25-M36. The target groups for this document are all the identified stakeholders in the TED Strategy:

- Shallow geothermal specialists: Geologists, Manufacturers for GSHP Equipment, GSHP applications designers, GSHP Researchers
- Constructors, architects, building, structural and H&C engineers, technicians and installers
- Energy and Environment Agencies
- Historical buildings and Monument protection specialists
- Regulatory authorities in energy and H&C
- Local authorities and energy decision makers at local, regional and national level
- Real estate investors and funding institutions
- Lawyers (specialised in environment, construction)
- Ecologists, opinion formers, media
- Building owners representatives and general public interested in energy savings and ecology
- *Undergraduate and PhD students*

The **main conclusions** of the D8.8 – Third report on implementation of TED activities are largely presented at the end of this deliverable. Shortly they are the following:

1. Although during the reporting period, the entire project activity was **profoundly and dramatically marked by the coronavirus pandemic**, all the partners struggled TO ADAPT and NOT TO ABANDON the dissemination activities. All the project partners initiated actions as it is reflected in the synthesis table included in the core of this deliverable and in the following chapters of this deliverable.
2. Even if the intensity, density and consistency of the partners' TED activity was planned to increase from year #1 to year #4, as concrete research results were slowed in the reporting period of time M25-M36, the TED activity was also influenced.
3. After the signing of the addendum that will extend the duration of the project by one year and after the resumption in force of the research activity and the activity on the demo-sites where the new equipment and technologies are tested and demonstrated, TED activity will also return to the intensity with which it was planned.
4. Under the given conditions, TED activity was focussed in promoting both the objectives and the research progress made by the partners to all the stakeholders categories.

## Abbreviations

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GEO4CIVHIC	Most Easy, Efficient and Low Cost Geothermal Systems for Retrofitting Civil and Historical Buildings
TED	Training, Education and Dissemination

## Introduction - Peculiarity of the activity in the reported period

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In **GEO4CIVHIC** project the lead partner of WP8 is **Romanian Geoexchange Society**.

The initial planned duration of WP8 was 48 months (M1-M48). Task T8.1 duration was also 48 months, of which 6 months for planning and the rest for implementation and reporting (M7-M48).

The TED planning activity was developed in M1-M6 (April – September 2018) and was reported in the deliverable D8.3 – TED Plan..

In the implementation period of time, 4 deliverables were meant to report the progress of TED Plan:

1. After the first 12 months M1 - M12 – **Deliverable D8.4** – First TED Report - *Delivered*
2. After the second year M13 - M24 – **Deliverable D8.5** – Second TED Report - *Delivered*
3. After the third year M25 - M36 – **Deliverable D8.8** – Third TED Report – *This document*
4. At the end of the project for M37 - ~~M48~~ end project – **Deliverable D8.12** – Final TED Report – *To be delivered*.

Due to the current pandemic situation, an amendment will be necessary to extend the duration of the project a GA addendum will prolong the entire project from 48 to 60 of some months. [AB1] This decision extension of the project will induce that the last deliverable will cover from month 37 to the end of project a supplementary [AB2] TED yearly report / deliverable for the year added at the project duration. Therefore, D8.12 will not be the FINAL deliverable in task 8.1, becoming only the “Fourth TED Report” and a new deliverable D8.13 – Final TED Report will present the TED activity for M49 M60 period of time.

## 1. Synthesis table of TED activities implemented in M25 – M36

The synthesis of implemented actions is presented below in a simplified but relevant format. It was realized based on partners TED reports which were delivered in March 2021.

The “**Planning area**” – Column [1] and [2], the green colour cells kept the information inserted in the TED initial plan and serves as base of comparison for the implemented activity.

In the “**Reporting Area**” – Column [3], the light yellow colour cells present the implemented actions for planned dissemination methods in M25-M36. In the same column, the light blue colour cells present the implemented actions in M25-M36 **in advance**. In the white colour cells are presented the explanations or N/A - Not Applicable actions.

Due to the need to maintain the table at a synthetic level, the more complex issues / activities were presented in details in the following sub-chapters, at the end of this table.

Dissemination Method	PLANNING AREA		REPORTING AREA
	Planned actions Description of the concrete planned action(s)	Planned deadlines	Implemented actions
0	1	2	3
1. Training courses	<p>1. The partners appointed by the GA as responsible for the training activity included in their organization TED Plans the task to organize <b>the national workshops and training courses both for specialists and for non-specialists</b>, as follows:</p> <ul style="list-style-type: none"> <li>Spain – UPV</li> <li>Germany – FAU</li> <li>Romania – PIETRE EDIL</li> <li>Greece – CRES</li> <li>Belgium – GEOGREEN (French) and GALLETTI (Dutch)</li> <li>Ireland – GEOSERV</li> <li>Switzerland – SUPSI</li> <li>Italy – UNIPD</li> <li>Summer / winter school – UNESCO and CNR</li> </ul> <p>2. The WP leaders: <b>WP1 - UNIPD, WP2 - FAU, WP3 – GALLETTI, WP4 – TECNALIA, WP5 – RED, WP6 – GEOSERV, WP7 – SOL, WP8 - RGS and the coordinator, WP9 – CNR</b> included in their TED Plans the task to “train the trainers” for all the partners, before the national course sessions.</p> <p>3. All the project partners: <b>CNR, UNIPD, UPV, RED, GEOSERV, GALLETTI, TECNALIA, TKI, UNESCO, FAU, RGS, CRES, HYDRA, UBeG, GEOGREEN, PIETRE, SOL, DLH and SUPSI</b> have included in their TED Plans the task to promote the national training courses.</p>	Year #4 M37-M47	<p>The training courses activity was meant to present the final research results of the project and therefore was initially planned in Year #4, more precise in the last months of the project M37-M47.</p> <p>Due to the future request of an <b>extension of the project duration</b>, the courses at the consortium level will be <b>re-planned in future last 6 months</b> of the project.</p> <p>However, the partners who had the opportunity to disseminate information in the online own courses system did so. Thus, <b>FAU</b> organized through their “Volkshochschule” (Adult Education Centre) the course with the title “The role of geothermal energy and geothermal heat for the heat transition” (Die Rolle der Geothermie und Erdwärme für die Wärmewende): <a href="https://www.youtube.com/watch?v=VJLHFBCoUk">https://www.youtube.com/watch?v=VJLHFBCoUk</a> in which they also presented the GEO4CIVHIC research results (minute 33:45 and 36:30). The addressed stakeholders were building owners representatives and general public interested in energy savings and ecology.</p>

<p><b>2. Training tools: Manual / Manual Historical buildings / Brochure</b></p>	<ol style="list-style-type: none"> <li>The leaders of the research WPs: <b>UNIPD, FAU, GALLETTI, TECNALIA, RED, GEOSERV, SOL and UNESCO</b> (for a Special Manual for Historic Buildings with the support of <b>CNR-ISAC</b>) included in their TED Plans the task to elaborate the corresponding chapters in all the training tools (Manuals and Brochures) and the corresponding short movies.</li> <li>The partners appointed as members of PSC – Project Specific Committees) according GA: <b>CNR, UNIPD, RED, SOLINTEL and RGS</b> included in their TED Plans the task of verification of all the training tool aspects: scientific, technic, administrative, financial, legal etc.</li> <li>The partner having English as native language: <b>GEOSERV</b> included in its own TED Plan the task of linguistic verification of all the training tools.</li> <li>The partners included in their TED Plans the (supporting) translation task for the training tools as follows:  <b>Spanish – UPV with TECNALIA support</b>  <b>German – FAU with UBeG support</b>  <b>Romanian – PIETRE EDIL with RGS support</b>  <b>Greek – CRES</b>  <b>French – GEOGREEN</b>  <b>Italian – UNIPD with CNR support</b></li> <li>The partner responsible for editing the training tools: <b>RGS</b> included this task in its TED Plan.</li> <li>All the project partners: <b>CNR, UNIPD, UPV, RED, GEOSERV, GALLETTI, TECNALIA, TKI, UNESCO, FAU, RGS, CRES, HYDRA, UBeG, GEOGREEN, PIETRE, SOL, DLH and SUPSI</b> have included in their TED Plans the tasks related to printing and distributing appropriate training tools to their own stakeholders in the local events.</li> </ol>	<p>Year #3 M25-M36</p>	<p>Due to the pandemic and to the delays in research and on situ activities, the Training Tools creation didn't start in M25. In fact, even in "normal" conditions in M25 it should be premature to start the training tools elaboration as far as the research activity should not be concluded. Such an approach should determine the necessity to realize multiple iterations, corrections and should lead to a non efficient work and to a huge waste of time. This situation / approach will be corrected in the GA addendum and in this way the manuals elaboration should start when the research should be accomplished.</p> <p>On the other hand, even if the Training Tool elaboration starting point was initially set by the GA in M25, in fact the activity started in <b>M12 – Management Meeting in Malta</b> and continued in <b>M18 - Management Meeting in Dublin</b> and in <b>M24 - Management Meeting</b> (initially planed in Erlangen, but finally realized) - <b>online</b>. In M18, RGS presented the <b>frame procedure</b> for training tools elaboration launching the debate of the aspects requesting the partners decision. The debating process will continue up to the elaboration start.</p> <p>The <b>FINAL frame procedure</b> was conceived as a working instrument that set all the aspects: objectives, resources, responsibilities, timing, formats, interfaces that will allow to efficiently create representative and utile training tools by the partners involved in this task. The <b>working procedure</b> was verified by the Coordinator and stored in the private area of the website in order to be approved by the partners in the next management meetings. After the consortium approval, the <b>FINAL working procedure</b> will be a complete set of elaboration rules.</p> <p>On the <b>25<sup>th</sup> of March 2020</b> a Skype meeting on the training tools issue gathered the responsible partner RGS and the project coordinator representatives. The decisions were the following:</p> <ul style="list-style-type: none"> <li>The Manual should keep the training structure of the modules in <b>European Centres of Excellence</b>.</li> <li>The elaboration responsibility was nominally allocated to 10 specialists in the project.</li> <li>Each of the 9 chapters will have max. 20-25 pages. Each of the 4 volumes will have max. 50-60 pages.</li> <li>The <b>editing operation</b> will be realized by a professional organization only for the ENGLISH training manual and for the ENGLISH Technical Brochure, not for 6 translated manuals and brochures.</li> <li><b>RGS</b> will be responsible for the <b>interfaces management</b> and will collect the FINAL texts, tables and graphics from the responsible authors and will transmit them to the professional editor. All these decisions were included in the procedure and will be approved in the next management meetings.</li> </ul>
<p><b>3. Project website / Partners websites / Social media / Project logo</b></p>	<ol style="list-style-type: none"> <li>As main responsible for the project website, <b>RGS</b> included in its TED Plan its creation and continuous update.</li> <li>All the project partners: <b>CNR, UNIPD, UPV, RED, GEOSERV, GALLETTI, TECNALIA, TKI, UNESCO, FAU, RGS, CRES, HYDRA, UBeG, GEOGREEN, PIETRE, SOL, DLH and SUPSI</b> have included in their TED Plans the task to continuously and promptly supply the website responsible and administrator with all the information regarding the project progress and accomplishments.</li> <li>All the project partners : <b>CNR, UNIPD, UPV, RED, GEOSERV, GALLETTI, TECNALIA, TKI, UNESCO, FAU, RGS, CRES, HYDRA, UBeG, GEOGREEN, PIETRE, SOL, DLH and SUPSI</b> have included in their TED Plans the task to continuously and promptly inform their own stakeholders about the project progress and accomplishments through all social media environments and their own organization websites, creating special options in the menu and including links to the GEO4CIVHIC website.</li> </ol>	<p>M1 – M48</p>	<p><b>RGS</b> - as the responsible for the maintenance and management of the website, regularly updated the project's website with all the inputs received from partners with regard to: events, publications, scientific articles and finalized deliverables. RGS included in its own website all new information regarding GEO4CIVHIC progresses. RGS disseminated internally (among the partners) the information regarding the website efficiency through the Monthly dashboards</p> <p><b>FAU</b> supplied the project website with information regarding technical and scientific events where GEO4CIVHIC was presented: in EU Energy Day <a href="https://geo4civhic.eu/events/eusew-energy-day-very-shallow-geothermal-energy-a-sleeping-giant-of-the-energy-revolution/">https://geo4civhic.eu/events/eusew-energy-day-very-shallow-geothermal-energy-a-sleeping-giant-of-the-energy-revolution/</a> At the same time, FAU included in its own website the news regarding its contribution in GEO4CIVHIC: EU Energy Day: <a href="https://www.fau.de/2020/06/news/veranstaltungen/virtueller-energyday-der-fau-die-oberflaechnahe-geothermie-und-ih-potenzial-fuer-den-green-new-deal/">https://www.fau.de/2020/06/news/veranstaltungen/virtueller-energyday-der-fau-die-oberflaechnahe-geothermie-und-ih-potenzial-fuer-den-green-new-deal/</a></p> <p><b>DLH</b> - In January 2021 it has been presented on DLH's Facebook account a synthetic update on the status of the technical preparations for the renovation of the Msida Bastion Historic Garden</p>



			<p>building.</p> <p><b>GEOSERV</b> actively supplied the project website with information and promoted GEO4CIVHIC by adding the project web link, logo and title to GeoServ standard signature section.</p> <p><b>SOLINTEL</b> - Presented the results of the Project in the organization web page.</p> <p><b>PIETRE EDIL</b> updated the company website with relevant information about the GEO4CIVHIC project. In its new website <a href="https://pietreworks.com/">https://pietreworks.com/</a> PIETRE EDIL included a larger set of information regarding GEO4CIVHIC and the company role in the project. PIETRE is permanently involved in social media projects activities, through the website of the company and created a direct link in the own site to the GEO4CIVHIC site. In its new website the company created a special blog where the project's results and activities are uploaded.</p> <p><b>SUPSI</b> – Inserted in LinkedIn information about SUPSI participation in EGEC Trieste action <a href="https://www.linkedin.com/posts/linda-soma-49607170_shallow-geothermal-a-promising-renewable-activity-6728982132997275648-scp/">https://www.linkedin.com/posts/linda-soma-49607170_shallow-geothermal-a-promising-renewable-activity-6728982132997275648-scp/</a></p> <p><b>UNESCO</b> – dedicated a specific page to GEO4CIVHIC since the start of the project and this page has been updated regularly during the period M25-M36: <a href="https://en.unesco.org/fieldoffice/venice/geo4civhic">https://en.unesco.org/fieldoffice/venice/geo4civhic</a> (last update occurred in November 2020). In the organization website was also included an interview with Adriana Bernardi – GEO4CIVHIC project coordinator about how the pandemic has impacted her work and personal life (November 2020): <a href="https://en.unesco.org/news/covid-19-and-impact-women-scientists">https://en.unesco.org/news/covid-19-and-impact-women-scientists</a>. In October 2020 GEO4CIVHIC project has been also mentioned in the following news: ARTECLIMA - Cultural Heritage Conservation and Protection in the wake of Climate Change. The news were dedicated to the event held in Rome, Italy with the participation of UNESCO Director: <a href="https://en.unesco.org/news/arteclima-cultural-heritage-conservation-and-protection-wake-climate-change">https://en.unesco.org/news/arteclima-cultural-heritage-conservation-and-protection-wake-climate-change</a>.</p> <p><b>UNESCO Venice Office Twitter:</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Posted tweet on an online workshop held by GEO4CIVHIC at the Euroscience Open Forum 2020 (August 2020): <a href="https://twitter.com/UNESCOVenice/status/1297962902293544960">https://twitter.com/UNESCOVenice/status/1297962902293544960</a></li> <li><input type="checkbox"/> Posted tweet for dissemination of Interview with Adriana Bernardi (November 2020): <a href="https://twitter.com/UNESCOVenice/status/1329025910260035585">https://twitter.com/UNESCOVenice/status/1329025910260035585</a></li> <li><input type="checkbox"/> Posted tweet for dissemination of ArtEclima event, where GEO4CIVHIC was presented (September 2020): <a href="https://twitter.com/UNESCOVenice/status/1306886052125323264">https://twitter.com/UNESCOVenice/status/1306886052125323264</a></li> </ul> <p><b>UNESCO Venice Office Facebook:</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Disseminated the Interview with Adriana Bernardi (November 2020): <a href="https://www.facebook.com/VeniceOffice/posts/5112983792052534">https://www.facebook.com/VeniceOffice/posts/5112983792052534</a></li> <li><input type="checkbox"/> Disseminated ArtEclima event, where GEO4CIVHIC was presented (October 2020): <a href="https://m.facebook.com/VeniceOffice/posts/4987536727930575?locale2=ne_NP">https://m.facebook.com/VeniceOffice/posts/4987536727930575?locale2=ne_NP</a></li> </ul> <p><b>NOTE:</b> The website and social media content, activity and efficiency will be separately and largely presented in the next sub-chapters of this deliverable.</p>
<p>4. Demo site information / Demo software products and</p>	<p>The WP5 leader <b>RED</b> and the other partners involved in the demo cases: <b>CNR, UNIPD, UPV, GALLETTI, FAU, TECNALIA, GEOSERV, HYDRA, TKI, GEOGREEN, UNESCO, PIETRE, DLH, CRES, SUPSI, RGS</b> included in their own TED Plans the tasks of supplying and disseminating the information for the real cases and virtual cases studies in order to be</p>	<p>M25-M48</p>	<p><b>CNR-ISAC</b> - A virtual visit of Padua pilot site has been planned in the framework of European Researcher Night 2021. The event will take place on 24-25 September 2021. Preliminary activities have been carried out, such as the preparation and submission of the proposal.</p>

<p><b>tools</b></p>	<p>used for identification, analyses and modelling activities and for the stakeholders information.</p>		<p><b>DLH</b> - A detailed description of the Technical preparations for the renovation of the Msida Bastion Historic Garden building and various engineering design work have been provided. Although the Covid19 pandemic crisis has put DLH infield activities temporary on hold, we are operational with our technical and planning work to be able to resume the installation of the geothermal system at once as soon as safe and healthful working conditions apply. The dissemination activity regarding this demo-site will accordingly be resumed.</p> <p><b>GEOSERV</b> - Development of an Excel based GEO4CIVHIC site selection and technology selection screening tool developed as part of WP6 and Deliverable 6.4 (M30). This tool was added in the project website.</p> <p><b>UNESCO</b> – On March 11<sup>th</sup>, 2021 <b>UNESCO World Heritage Centre Head</b> <a href="https://whc.unesco.org/">https://whc.unesco.org/</a> was informed about the activities implemented at the world Heritage Site of Ferrara and its Po Delta- Angels’ gate (real demo case) and at the world Heritage of Split Croatia (virtual demo case) up to March 2021.</p> <p><b>UNIPD</b> - Participated to the Technical Movie at the CNR-Padova demo case.</p> <p><b>RED</b> - As work package leader 5 leader RED has organized numerous actions regarding the gathering and dissemination of information on the respective demo sites between partners and operators involved in the implementation of the demo cases on site as reported per demo site.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> <b>Battel (Belgium)</b>. Provided information on the composition of the underground for the drilling using a local tool (SmartGeotherm project) and consulting the geological database of the Flanders region. Provided information on the renovation works, assisted in the design of the HVAC plant and disseminated all the information necessary to the site responsible (GEO-GREEN), the craftsmen (plumbers, electricians). Assisted UNIPD in the communication with the Flanders’ geologists on using the highly detailed and informatized geological database (in DUTCH) for the mapping task of UNIPD.</li> <li><input type="checkbox"/> <b>Malta</b>. Disseminated information to the site responsible, his engineers and local craftsmen on the heat pump, fan coil, geothermal field design, superficial connections, process flowchart. Facilitated a technical workshop to finalize the detailed drilling plan.</li> <li><input type="checkbox"/> Composing and transferring bill of loading for the overseas transport of the drilling rig and accessories.</li> <li><input type="checkbox"/> <b>Ferrara</b>. Facilitator in a scope adjustment and budget reshuffling exercise between UNESCO, Hi-Ref, UNIPD, the engineering studio, the Coordinator and the project officer. Dissemination of the information on the drilling methodologies to the authorities to obtain the geological drilling permit. Requests for quotation to drillers.</li> <li><input type="checkbox"/> <b>Dublin</b>. Interaction with site responsible and Hi-Ref to finalize design. Composing and transferring bill of loading for the overseas transport of the drilling rig and accessories.</li> <li><input type="checkbox"/> <b>Pilot site CNR</b>. Focal point of information gathering and dissemination amongst operators in the field (drillers, plumbers, electricians) and project partners (HYDRA, UNIPD, UPV, CNR-ISAC, CNR-ITC). Dissemination of information on monitoring system design and implementation</li> </ul>
<p>5. <b>Scientific / Technical Articles in specialized media</b></p>	<ol style="list-style-type: none"> <li>1. All the project partners: <b>CNR, UNIPD, UPV, RED, GEOSERV, GALLETTI, TECNALIA, TKI, UNESCO, FAU, RGS, CRES, HYDRA, UBeG, GEOGREEN, PIETRE, SOL, DLH and SUPSI</b> have included in their TED Plans the task of informing the national and European specialized media through minimum 3-6 articles on the project duration.</li> <li>2. <b>All the partners</b> included in their TED Plans the obligation to communicate the</li> </ol>	<p>M7-M48</p>	<p>In the period of time M25-M36 the following articles were presented in scientific events:</p> <ol style="list-style-type: none"> <li>1. <b>Scientific event: European Geological Union - 3-8 May, 2020</b> Article: <b>Assessing grouting mix thermo-physical properties for shallow geothermal systems</b> Partners involved: <b>UNIPD, UPV, CRES, FAU, GEOSERV, GEOGREEN, CNR-ISAC</b></li> </ol>

	<p>publication and to upload the articles in the GEO4CIVHIC project website.</p> <p>3. <b>CNR, UNIPD, RED and GALLETTI</b> included in their TED Plan the task of cooperating in the creation of articles for Scientific publications.</p>		<p>Authors: Enrico Garbin, Ludovico Mascarin, Eloisa Di Sipio, Gilberto Artioli, Javier Urchueguía, Dimitris Mendrinos, David Bertermann, Jacques Vercrusse, Riccardo Pasquali, Adriana Bernardi, Antonio Galgaro</p> <p>The paper in the project website: <a href="https://geo4civhic.eu/wp-content/uploads/2020/05/Assessing-grouting-mix-thermo-physical-properties-for-shallow-geothermal-systems-presentation.pdf">geo4civhic.eu/wp-content/uploads/2020/05/Assessing-grouting-mix-thermo-physical-properties-for-shallow-geothermal-systems-presentation.pdf</a></p> <p>2. <b>WEC CENTRAL &amp; EASTERN EUROPE ENERGY FORUM – FOREN 2020 - 7-10 September, 2020</b>  <b>European drillability mapping for shallow geothermal applications</b>  Partners involved: <b>UNIPD, UPV, UBeG, HYDRA, GEOSERV, GEOGREEN, FAU, RED, CNR-ISAC</b>  Authors: Antonio Galgaro, Eloisa Di Sipio, Giorgia Dalla Santa, Adela Ramos Escudero, Jose Manuel Cuevas, Burkhard Sanner, Davide Righini, Riccardo Pasquali, Jacques Vercrusse, David Bertermann, Luc Pockele, and Adriana Bernardi</p> <p>Paper in the project website: <a href="https://geo4civhic.eu/wp-content/uploads/2020/05/European-drillability-mapping-for-shallow-geothermal-applications.pdf">https://geo4civhic.eu/wp-content/uploads/2020/05/European-drillability-mapping-for-shallow-geothermal-applications.pdf</a></p> <p>3. <b>Scientific event: WEC CENTRAL &amp; EASTERN EUROPE REGIONAL ENERGY FORUM – FOREN 2020 14-18 June 2020</b>  Article: <b>Trends in the European Research in the domain of Heating and Cooling Systems with Geothermal Heat Pumps – research projects financed by the European Commission (CHEAP-GSHPs and GEO4CIVHIC)</b>  Partners involved: <b>RGS</b>  Authors: Robert Gavriluc, Doina Cucueteanu, Tiberiu Catalina</p> <p>Article in the project website: <a href="https://geo4civhic.eu/wp-content/uploads/2020/10/RGS-for-FOREN-2020-Final.pdf">https://geo4civhic.eu/wp-content/uploads/2020/10/RGS-for-FOREN-2020-Final.pdf</a></p>
<p>6. <b>Scientific / Technical Movies</b></p>	<p>The <b>Coordinator CNR</b> and the WP leaders <b>WP1 - UNIPD, WP2 - FAU, WP3 – GALLETTI, WP4 – TECNALIA, WP5 – RED, WP6 – GEOSERV, WP7 – SOL</b> included in their TED Plans the task of exemplifying and completing the information they included in each chapter of the Manuals with relevant short scientific and technical movies.  <b>All the other partners</b> included in their TED plan the task of cooperating at the movies with information / data / images from their own real and virtual demo-cases.</p>	<p>Year #3-4 M25-M36</p>	<p>The GA requests 3 kind of movies:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Technological movies made by partners for the use of practical demonstration in the training course lessons. Because of the specific difficulties induced by the pandemic regarding the concrete work in the demo sites, the movies were impossible to be realized in M25-M36.</li> <li><input type="checkbox"/> Animation movie regarding the technology and project objectives was realized by Scienceseed (Spain) and uploaded in website and on Youtube.  RED assisted Scienceeed in the script of the animation movie. During the installations of the borehole heat exchangers in June 2020 in the pilot site of the CNR, movies and pictures were taken for later dissemination and use in the project movie.</li> <li><input type="checkbox"/> Project movie (the long general approach on the project work and results) was designed in details, the advance amount was paid and the shooting should be started in the M24-M36 period. The concrete work did not start due to the impossibility to travel of the Scienceseed team.</li> </ul>
<p>7. <b>European Centres of Excellence (ECoE) for shallow geothermal applications</b></p>	<p>The partners responsible / involved for / in this activity in the GA, meaning: <b>UNIPD, CNR, RED, HYDRA, GALLETTI</b> (South Europe – Italy), <b>FAU, GEOSERV, TKI, UNESCO, UBeG</b> (Central – North Europe – Germany), <b>UPV, SOL, TECNALIA</b> (Western Europe – Spain), <b>RGS and PIETRE</b> (Eastern Europe – Romania) included in their TED Plans the task to implement the action and to support the teaching and knowledge dissemination through them.</p>	<p>Year #4 M37-M48</p>	<p>The ECoE activity was planned to be started in M37. In fact, the organizatoric activity started in Year #2. In the reported period of time M25-M36 The core members responsible for the implementation of Task 8.6 (UPV, UNIPD, FAU and RGS) together with the project coordinator CNR, have organized quarterly on-line meetings on: Febr. 18<sup>th</sup>, 2020; June 11<sup>th</sup>, 2020; Nov. 24<sup>th</sup>, 2020; and March 9<sup>th</sup>, 2021.</p> <p>The topics covered were:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Developing a draft for agreement</li> </ul>

			<ul style="list-style-type: none"> <li><input type="checkbox"/> Integration of stakeholders in each country</li> <li><input type="checkbox"/> Interaction with T8.2</li> <li><input type="checkbox"/> Definition of a timeline</li> </ul> <p>As result of these meetings, on March 9<sup>th</sup>, 2021, it was concluded on the following items:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Presentation of the final version of the agreement. Final details. Signing procedure.</li> <li><input type="checkbox"/> Action plan 2021: first activities planned.</li> <li><input type="checkbox"/> Process of adhesion of third entities (collaborators, associates, supporters, followers).</li> <li><input type="checkbox"/> Cooperation formal agreements with technical trade associations, non profit organizations and universities, as <b>partners in ECoE activity in the future.</b></li> </ul> <p><b>UPV</b> - Set up the baseline for the Western ECoE, drawn up the agreement document between the different ECoEs and developed the draft plan of activities proposed for 2021.</p> <p><b>RED</b> - Participated in all of the meetings on the Centres of Excellence organized by UPV and contributed to the definition of the course structure and the content of the training modules</p> <p><b>RGS</b> – Prepared its contribution to the infrastructure of the CoE for SE Europe and the agreement partnership with Technical University of Civil Engineering Bucharest and University for Oil and Gas Ploiesti.</p> <p><b>FAU</b> - Leader of Central European CoE: contributed to the content of the collaboration agreement.</p> <p><b>GEOSERV</b> - Attendance of meeting #3 No and contributed at ECoE planning activity meetings to discuss the geographic distributions of the ECoE, the potential contribution from private sector organisations and to facilitate the progress and development of the draft agreement and timeline.</p> <p><b>UBeG</b> - Contributed to detailing plans for the CoE around FAU, by email and during virtual meetings with FAU and the other partners; also contacts to check for collaboration with ECoE based at UPV.</p>
<p><b>8. Participation in Standardization Bodies</b></p>	<p>All the project partners: <b>CNR, UNIPD, UPV, RED, GEOSERV, GALLETI, TECNALIA, TKI, UNESCO, FAU, RGS, CRES, HYDRA, UBeG, GEOGREEN, PIETRE, SOL, DLH and SUPSI</b> have included in their TED Plans the task of contacting their national and the European standardization bodies in order to contribute at the update of the current standards with provisions resulted in the project research activity for historic buildings applications.</p>	<p>Year #3- #4 M25-M48</p>	<p>Some partners in the project are directly involved in the European standardization activity and used their position to continuously present GEO4CIVHIC in these structures. They had a substantial contribution in the standardization activity including in the project technical themes, as follows:</p> <p><b>CNR-ITC</b> - Participation to Annex 54 Heat pump systems with low GWP refrigerants - Sergio Bobbo, Laura Fedele <a href="https://heatpumpingtechnologies.org/annex54/">https://heatpumpingtechnologies.org/annex54/</a></p> <p><b>GEOSERV</b> - Attendance of 12 No. Meetings from CEN WG451 on the development of the prEN 17522 on the <i>Design, Installation and Commissioning of BHEs</i>. The contribution included the attendance of the meeting in advance of the publication of the draft consultation standard. Following the completion of the consultation and voting period, an additional 12 No meetings for review of the official comments and drafting of the standard were attended – this process is ongoing and the GEO4CIVHIC BHE materials and connections are accepted as part of the standard.</p> <p><b>TECNALIA</b> - has contacted the EHPA (European Heat Pump Association) to clarify the ASHRAE standards that cover Life Cycle Assessment and Carbon Footprint of Heat Pumps.</p> <p><b>RGS</b> - Participation in CEN TC 451 WG2 “Borehole heat exchangers” – activity finalized in PrEn 17522 standard. On Dec. 11<sup>th</sup>, 2020 RGS participated at the Webinar organized by EGEC during EUSEW 2020 and RGS presented the applicable standards (in cooperation with Burkhard Sanner - UBeG and Riccardo Pasquali-GEOSERV).</p> <p><b>UBeG</b> - Contribution to German standard VDI 4640 (member of committee): Final work on VDI 4640-5 on TRT, released July 2020 (B Sanner, M Sauer); participation in new sub-committee VDI</p>

			<p>4640-6 on grouting materials (E Mand). Communication with members of CEN TC/451.</p> <p><b>RED</b> - has collaborated with the different partners through their involvement in the national mirror groups to provide feedback on the European draft on borehole heat exchangers and drilling procedures, in particular comments were made to secure that the <b>Hydra-Red</b> method and the heat exchangers are included and/or allowed in the European standard. In addition, with <b>GEO-GREEN</b> the representation of the Belgian standardization institute and the participation of Belgian experts in the further work on the European standard has been organized.</p> <p><b>UNIPD</b> - Actively participated with comments in Pr EN 17522 of the CEN/TC 451/WG 2.</p>
<p>9. <b>Links with EU Programs / Platforms / Initiatives</b></p>	<p>All the project partners: <b>CNR, UNIPD, UPV, RED, GEOSERV, GALLETI, TECNALIA, TKI, UNESCO, FAU, RGS, CRES, HYDRA, UBeG, GEOGREEN, PIETRE, SOL, DLH and SUPSI</b> have included in their TED Plans the task of identify / contact / link / cooperate in a synergic way with and national and European programs, platforms and initiatives.</p>	<p>M7-M48</p>	<p>A lot of partners, continued to maintain the information exchange with other geothermal projects and platforms as it is presented in the following lines.</p> <p><b>GEOSERV</b> - RHC-Platform/Geotrainet/EGEC – European Geothermal Days - 4/12/2020 - Renovation of public buildings in Ireland with geothermal energy solutions – Presentation including the work of the GEO4CIVHIC project solutions and the contributions these an have in line with current retrofit policy in Ireland.</p> <p><b>FAU</b> - <u><a href="https://www.bayfor.org/en/news/events/detail-en/events/show/virtual-energy-day-very-shallow-geothermal-energy-a-sleeping-giant-of-the-energy-revolution.html?no_cache=1&amp;cHash=27ac99f62a5628638c85543eb75adca9">EU Sustainable Energy Week 2020 – Virtual Energy Day – Very Shallow Geothermal Energy: A Sleeping Giant of the Energy Revolution (29.07.2020)</a></u>. Link: <a href="https://www.bayfor.org/en/news/events/detail-en/events/show/virtual-energy-day-very-shallow-geothermal-energy-a-sleeping-giant-of-the-energy-revolution.html?no_cache=1&amp;cHash=27ac99f62a5628638c85543eb75adca9">https://www.bayfor.org/en/news/events/detail-en/events/show/virtual-energy-day-very-shallow-geothermal-energy-a-sleeping-giant-of-the-energy-revolution.html?no_cache=1&amp;cHash=27ac99f62a5628638c85543eb75adca9</a></p> <p><b>RGS</b> – Based on RGS initiative, the Romanian Ministry for Investments and European Projects includes among the “<b>best practice examples</b>” directly managed by the European Commission the projects <b>Cheap- GSHPs</b> and <b>GEO4CIVHIC</b>. <a href="https://geo4civhic.eu/events/best-practice-examples/">https://geo4civhic.eu/events/best-practice-examples/</a></p> <p><b>UPV</b> - Attendance at all project meetings within H2020 project <b>GEOCOND</b>, as a coordinator and reporting on possible synergies with GEO4CIVHIC. Collaboration in the organization of Shallow Geothermal Days 2020 11th of December Part 2 (11:00 to 12:30): Research on Life Cycle Assessment of geothermal – “EU Standards and Regulations”, (by Robert Gavriiuc - RGS) and “Share of best practices of EU funded research and innovation: <b>GEOCOND, GEOENVI GEO4CIVIC</b>” (moderator Burkhard Sanner UBeG).</p> <p><b>UBeG</b> - Attended all project meetings within H2020-project <b>GEOCOND</b>, as a partner there. Attended (B Sanner) virtual meetings/webinars of the geothermal panel of <b>RHC-ETIP</b>. Planning of inter-project workshops on mapping for shallow geothermal to be held in Sweden in June 2020, but cancelled due to pandemic, as was with the workshop planned for 4 March 2020 in Offenburg, ahead of GeoTherm. In contact with <b>MUSE</b> project for a virtual activity in 2021.</p> <p><b>PIETRE EDIL</b> - is permanently connected to the national platform of European projects and in this period tried to find connections with other similar or complementary EU programmes. With a target of finding a future funding possibility to implement on the market the future results of GEO4CIVHIC project.</p> <p><b>RED</b> - has participated in the activities of the RHC-ETIP, the geothermal panel in particular, and EGEC to promote the GEO4CIVHIC developments. In addition RED participated on line to the European Geothermal days. Links with the <b>GEOCOND</b> project were made by taking charge of the installation of the <b>GEOCOND</b> heat exchanger at the CNR pilot site.</p> <p><b>SOLINTEL</b> - Networking with other project consortiums and with ECTP.org platform where SOLIN-</p>

			<p>TEL is a Member.</p> <p><b>UNIPD</b> - Participation to the ESOF2020 event: “Workshop Mapping of ground eligibility for drilling methodologies and borehole heat exchangers” (2-6 September 2020) and at online Workshop organized by ENERAG project: “Shallow geothermal energy: from the ground to buildings, from the field to modelling” (30 November - 3 December 2020).</p>
10. Internal Project meetings	All the project partners: <b>CNR, UNIPD, UPV, RED, GEOSERV, GALLETTI, TECNALIA, TKI, UNESCO, FAU, RGS, CRES, HYDRA, UBeG, GEOGREEN, PIETRE, SOL, DLH and SUPSI</b> have included in their TED Plans the task of actively participation in internal project meetings.	M1-M48	<p>Because the entire reporting period (M25-M36) was covered by travel restrictions dictated by the Coronavirus pandemic, all the management meetings took place online. The place of the detailed 2-3 days management meetings, with all the partners present face to face, and in which all the issues were debated in detail up to a feasible solution, was taken by long one-day management meetings (focused on the crucial aspects of the project), to which were added other innumerable specific meetings convoked by the WP leaders or even by task leaders.</p> <p>These partial management meetings (on WP or task) had the advantage of extremely detailed and specialized debates among directly involved partners, but also had the disadvantage that the vast majority of partners (who were not part of that respective WP or task) lost contact with the overall image of the project as well as of the WPs and tasks in which they were not directly involved. The general management meetings were the following:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> April 30<sup>th</sup> 2020 – 24 months meeting in the consortium,</li> <li><input type="checkbox"/> Oct. 13<sup>th</sup>, 2020 – 30 months meeting in the consortium,</li> <li><input type="checkbox"/> Dec. 10<sup>th</sup>, 2020 – 2<sup>nd</sup> Review meeting,</li> <li><input type="checkbox"/> March 30<sup>th</sup>, 2021 – 36 months meeting of the consortium.</li> </ul> <p>Some WP / task management meetings took place as follows:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> <b>WP7</b> management meetings on April 7<sup>th</sup>, 2020, June 26<sup>th</sup> 2020 (business model), on October 8<sup>th</sup> 2020, on March 9<sup>th</sup> 2021;</li> <li><input type="checkbox"/> <b>WP4 - Task 4.5</b> management meetings on May 29<sup>th</sup> 2020, on December 17<sup>th</sup> 2020, on January 14<sup>th</sup> 2021, on February 10<sup>th</sup> 2021, on March 5<sup>th</sup> 2021 and on March 25<sup>th</sup> 2021;</li> <li><input type="checkbox"/> <b>WP6</b> management meeting on April 22<sup>nd</sup> 2020 (DSS tool), June 4<sup>th</sup> 2020, October 5<sup>th</sup> 2020; October 13<sup>th</sup> 2020, December 17 2020 and January 19<sup>th</sup>, 2021 on T6.4,</li> <li><input type="checkbox"/> <b>WP8 – Task 8.6</b> management meetings on February 18<sup>th</sup>, 2020; June 11<sup>th</sup>, 2020; November 24<sup>th</sup>, 2020; and March 9<sup>th</sup>, 2021.</li> </ul> <p>All the information regarding the meetings: agendas, presence, presentations and minutes were <b>uploaded on the website – PRIVATE area.</b></p>
11. Congress / Conference / Workshop participation and presentations	All the project partners: <b>CNR, UNIPD, UPV, RED, GEOSERV, GALLETTI, TECNALIA, TKI, UNESCO, FAU, RGS, CRES, HYDRA, UBeG, GEOGREEN, PIETRE, SOL, DLH and SUPSI</b> have included in their TED Plans the participation in minimum 2 national and international congresses, conferences and workshops with oral communications / papers / posters, leaflets and brochures presenting project aims and scope, partial and final results of the project activity. Some partners specified the events: <b>UNIPD</b> (EGC 2019, Geofluid 2018, CLIMA 2019, WGC 2020), <b>RGS</b> (EGC 2019 Den Haag, REHVA Clima 2019 Bucharest), <b>UBeG</b> (GeoTherm Offenburg 2020 and / or 2021, EGC 2019, ISEC 2018 Graz), <b>UNESCO</b> (World Heritage Site of Ferrara and its Po Delta- Angels’ gate, World Heritage of Split Croatia).	M7-M48	<p>In the first 8-9 month of the reported period of time, the Coronavirus pandemic put on hold all the important world, European and national scientific and technic events in geothermal domain, conferences, congresses, fairs, workshops etc.</p> <p>In the last months of the reported period of time some events were developed online and gave offered some opportunities to promote the scientific results of GEO4CIVHIC project.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> June 29<sup>th</sup> 2020 - EUSEW Energy Day – “<b>Very Shallow Geothermal Energy: A Sleeping Giant of the Energy Revolution</b>”;</li> <li><input type="checkbox"/> September 2<sup>nd</sup> -6<sup>th</sup> 2020 - <b>ESOF 2020 Euroscience Open Forum</b> – Trieste; on line;</li> <li><input type="checkbox"/> September 3, 2020 – International workshop (online) “<b>Shallow Geothermal: a promising renewable resource for heating and cooling</b>”;</li> <li><input type="checkbox"/> September 3<sup>rd</sup> 2020 – <b>BRENET Conference 2020</b> (Aarau, Switzerland);</li> <li><input type="checkbox"/> September 7<sup>th</sup> – 10<sup>th</sup> 2020 – <b>FOREN 2020 WEC Central &amp; Eastern Europe Energy Forum</b> (online, Romania)</li> </ul>

			<ul style="list-style-type: none"> <li>❑ September 21<sup>st</sup> 2020 – Conference “ArtEclima: tra emergenze e difesa dei nostri Beni Culturali” (Rome, Italy).</li> <li>❑ November 30<sup>th</sup> 2020 – International workshop “Shallow geothermal energy from the ground to buildings, from the field to modelling” (online Italy);</li> <li>❑ November 27<sup>th</sup> 2020 – Seminar “ITC - Progetti di ricerca europei” in the frame of “La notte europea dei Ricercatori” (organized by CNR-ITC);</li> <li>❑ November 30<sup>th</sup> - December 3<sup>rd</sup> 2020 - Workshop ENeRAG project “Shallow geothermal energy: from the ground to buildings, from the field to modelling” (online)</li> <li>❑ December 11<sup>th</sup> 2020 – Conference “Building Back Better: A Future for Geothermal Energy in Northern Ireland”;</li> <li>❑ January 20<sup>th</sup> 2021 - Conference “Market access in Kazakhstan in the sustainable energy sector” organised by UNIDO (online, UNESCO participation);</li> <li>❑ February 15<sup>th</sup> – 16<sup>th</sup> 2021 – “12<sup>th</sup> European Geothermal Days” (online – Paris, France);</li> <li>❑ March 4<sup>th</sup> 2021 – Conference UNESCO World Engineering Day for Sustainable Development “Engineering a Healthy Planet”;</li> <li>❑ March 24<sup>th</sup> – 25<sup>th</sup> 2021 – Conference “Artificial Intelligence in Architecture, Engineering and Construction” (virtual, Spain, Tecnalia).</li> </ul> <p>Supplementary information regarding these technic and scientific events are described in GEO4CIVHIC website and some extended information and links are presented in Chapter 2 of D8.8. The presentations / posters are also included in the project website.</p>
<p><b>12. National Workshops in partners countries</b></p>	<p>The partners appointed by the GA as responsible for the training activity included in their TED Programs the task to organize <b>the national workshops</b> as follows:</p> <p><b>Spain – UPV</b>  <b>Germany – FAU</b>  <b>Romania – PIETRE EDIL</b>  <b>Greece – CRES</b>  <b>Belgium – GEOGREEN (French)</b>  <b>Ireland – GEOSERV</b>  <b>Switzerland – SUPSI</b>  <b>Italy – UNIPD</b>  <b>Summer / winter school – UNESCO and CNR</b></p>	<p>Year #3 M37-M48</p>	<p style="text-align: center;">N/A</p>
<p><b>13. Flyers / brochures / leaflets / factsheets / press releases semester newsletters</b></p>	<ol style="list-style-type: none"> <li>1. As TED responsible partner, RGS included in the TED plan the elaboration of project’s leaflet, initial brochure, factsheets, newsletters.</li> <li>2. All the project partners: CNR, UNIPD, UPV, RED, GEOSERV, GALLETTI, TECNALIA, TKI, UNESCO, FAU, RGS, CRES, HYDRA, UBeG, GEOGREEN, PIETRE, SOL, DLH and SUPSI have included in their TED Plans the tasks of disseminating the project mentioned documents (leaflet, initial brochure, factsheets, newsletters) and to create their own dissemination tools in the national language: roll-ups, posters, flyers for their own targeted stakeholders.</li> </ol>	<p>M7-M48</p>	<p>RGS with the partners support created the Newsletter #4 <a href="https://us19.campaign-archive.com/?u=63b53ed865d159e6d793fb7e4&amp;id=525d2a4b3b">https://us19.campaign-archive.com/?u=63b53ed865d159e6d793fb7e4&amp;id=525d2a4b3b</a> and Factsheet #3 – (M19-M36) - in progress. All these project documents are uploaded in the project website.</p> <p>THYSSEN created a flyer “VibroDrill VD80-VD105” regarding the products created based on GEO4CIVHIC research activity.</p> <p>UNESCO - BRIDGES Newsletter #2 (July-December 2020): Interview with Prof. Adriana Bernardi coordinator of GEO4CIVHIC H2020 project: <a href="https://unesdoc.unesco.org/ark:/48223/pf0000220194">https://unesdoc.unesco.org/ark:/48223/pf0000220194</a>. The UNESCO Regional Bureau for Science and Culture in Europe provided inputs about GEO4CIVHIC project for the UNESCO HQ Tracker Culture and Public Policy - Regional Inputs for Issue 4 (December 2020): <a href="https://en.unesco.org/news/tracker-culture-public-policy-issue-4">https://en.unesco.org/news/tracker-culture-public-policy-issue-4</a>. UNESCO also disseminated its NEWS PRESS RELEASE including an interview with Adriana Bernardi, coordinator of the EU H2020 project GEO4CIVHIC, about how the pandemic has impacted her work and personal life, published at the UNESCO website (November 2020) - <a href="https://en.unesco.org/news/covid-19-and-impact-">https://en.unesco.org/news/covid-19-and-impact-</a></p>

			<p><a href="https://en.unesco.org/news/arteclima-cultural-heritage-conservation-and-protection-wake-climate-change">women-scientists</a> and a NEWS PRESS RELEASE regarding ARTeCLIMA: Cultural Heritage Conservation and Protection in the wake of Climate Change (October 2020): <a href="https://en.unesco.org/news/arteclima-cultural-heritage-conservation-and-protection-wake-climate-change">https://en.unesco.org/news/arteclima-cultural-heritage-conservation-and-protection-wake-climate-change</a></p> <p><b>GEOSERV</b> – Published in March 2021 a GEO4CIVHIC project update and a detailed presentation of the case studies in <a href="#">Geothermal Association of Ireland Newsletter 27</a>.</p>
14. Deliverables / Reports / other documents according GA	All the WP responsible partners <b>UNIPD, FAU, GALLETI, TECNALIA, RED, GEOSERV, SOL, RGS and CNR</b> have included in their TED Plans the task to realize / coordinate the elaboration of the 68 deliverables in the project (WP1 – 6, Wp2 – 7, WP3 – 7, WP4 – 13, WP5 – 9, WP6 – 7, WP7 – 6, WP8 – 12, WP9 – 1)..	M1-M48	<p>All the partners participated with technical and scientific material, information and data in the elaboration of the project deliverable, according their obligations stipulated in the GA.</p> <p>All the responsible partners for different deliverables submitted them in EC portal, in due time.</p> <p>All the submitted deliverables were simultaneously uploaded in the website, in public or private area depending on their settings (at the address <a href="http://geo4civhic.eu/wp-deliverables">geo4civhic.eu/wp-deliverables</a>).</p>
15. Supplementary actions due to the pandemic			<p>Many specialists involved in GEO4CIVHIC attended a lot of technical and scientific online events by their own and not necessarily representing their organizations.</p> <p>Many specialists added at their electronic signature in email messages 2 lines and the link to GEO4CIVHIC Horizon2020 project.</p> <p>The Coordinator of GEO4CIVHIC project Adriana Bernardi was interviewed in UNESCO website about COVID-19 and the impact on women scientists. (<a href="https://en.unesco.org/news/covid-19-and-impact-women-scientists">https://en.unesco.org/news/covid-19-and-impact-women-scientists</a>)</p> <p>The <b>UNESCO</b> Regional Bureau for Science and Culture in Europe provided inputs about GEO4CIVHIC project for the UNESCO's inputs to the annual Report of the Secretary General on DRR and UN Plan of Action for DRR. This is a reporting of 12 months activities Jan 2020-June 2021 (March 2021) - <a href="http://www.undrr.org">www.undrr.org</a> . The <b>UNESCO</b> Regional Bureau for Science and Culture in Europe provided inputs about GEO4CIVHIC project for the website of the Permanent Delegation of Italy to the International Organizations in Paris, France (February 2021): <a href="http://www.italiarapparigi.esteri.it">www.italiarapparigi.esteri.it</a> .</p>



## 2. Details on the most important type of TED activities implemented in M25-M36

### 2.1 Impact of the project website and social media platforms

The project website is available at [www.geo4civhic.eu](http://www.geo4civhic.eu) and its elaboration process was largely described in the deliverable D8.2 “Production of project website”.

As responsible for WP8, in M25-M36, **RGS** has undergone the assigned activity - maintenance and update of the project website – as this website represents the most important platform for disseminating the information about the projects’ results. The structure of the website covers all the important aspects of the project’s activity that are of maximum interest both for EXTERNAL and for INTERNAL communication.

In M25-M36, the current pandemic situation induced a slight increase of 30-32% in online awareness / presence of GEO4CIVHIC compared to the previous reporting period M13-M24.

#### April 2019 - March 2020

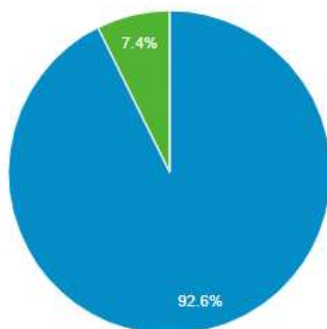


#### April 2020 - March 2021



The greatest majority of the visitors were from Europe:

The average duration of the website visits was 10 minutes and the maximum was of 30 minutes.



The visitors were 7,4 returning visitors and 92,6 new ones.

A similar trend (better in the Instagram – 39% and in the LinkedIn 75%) was kept in the social media number of followers:

**April 2019 - March 2020**

**Twitter:** 69  
**Facebook:** 109  
**Instagram:** 51  
**LinkedIn:** 24

Presence on **Twitter:**

**April 2020 – March 2021 Tweets:** 11  
**Total Tweets:** 37  
**Followers:** 86



**April 2020 - March 2021**

**Twitter:** 86  
**Facebook:** 111  
**Instagram:** 71  
**LinkedIn:** 42

Presence on **Facebook:**

**April 2020 – March 2021 Posts:** 12  
**Total Posts:** 46  
**Followers:** 111  
**Page likes:** 110



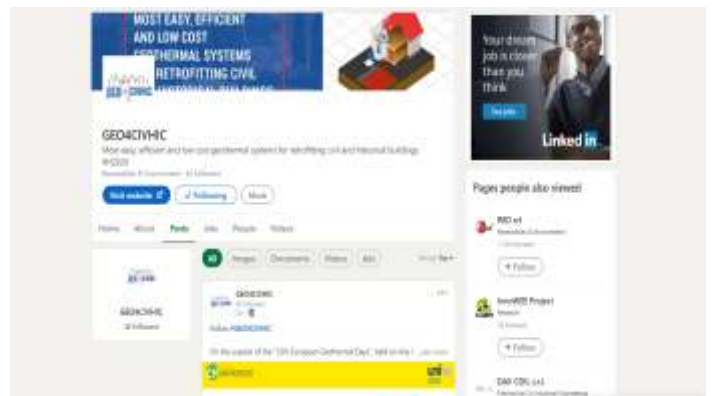
Presence on **Instagram:**

**April 2020 – March 2021 Posts:** 11  
**Total Posts:** 36  
**Followers:** 71



Presence on **LinkedIn**

**April 2020 – March 2021 Posts:** 11  
**Total Posts:** 37  
**Followers:** 42



The qualitative and quantitative activity in the project website is reflected in the **GEO4CIVHC Monthly Dashboard** sent to all the partners on the 1<sup>st</sup> of each month for the previous one. These aspects are also analysed in all the semester management meetings, especially the visits dynamic, the interested pages and menu options, the predominantly countries of the visitors. The most important conclusions extracted from these debates, allowed the continuous improvement of the website aspect and content.

An important increase of the GEO4CIVHC project in the virtual area was generated by the posts regarding the project or partners contributions in their own websites of the partners.

All the important project documents – meetings agenda, presentations, minutes of meetings and, of course, the due deliverable that were uploaded in EU portal, were also uploaded in the project website, in PUBLIC area <https://geo4civhic.eu/public-publications/> or in PRIVATE area <https://geo4civhic.eu/private-publications/> depending on the GA rules and on their content. The deliverables were finalized and submitted in due time and were uploaded in the website at the address <https://geo4civhic.eu/wp-deliverables/> also depending on their PUBLIC or PRIVATE access setting.

## 2.2 Participation / articles presented in national and international events / journals

The synthesis table (in Chapter 1) summarizes the most important scientific and technic events in which, despite the pandemic, a large number of partners were involved: congresses, conferences, webinars, workshops, seminars etc. Almost all these events were developed online.

Some details regarding the consortium presence are detailed in the following lines:

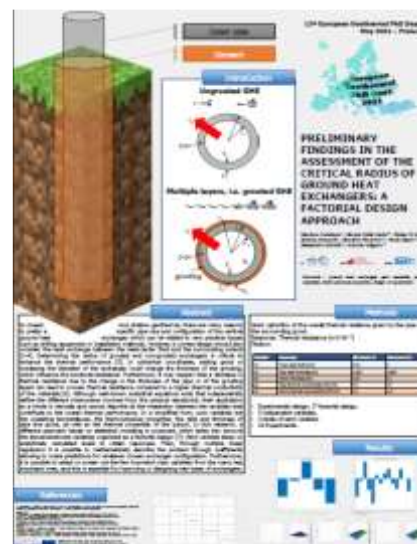
- ❑ May 3<sup>rd</sup> – 8<sup>th</sup> 2020 - **European Geological Union General Assembly**
  - Article: **Assessing grouting mix thermo-physical properties for shallow geothermal systems**  
Partners involved: **UNIPD, UPV, CRES, FAU, GEOSERV, GEOGREEN, CNR-ISAC**  
Authors: Enrico Garbin, Ludovico Mascarin, Eloisa Di Sipio, Gilberto Artioli, Javier Urchueguía, Dimitris Mendrinou, David Bertermann, Jacques Vercruysse, Riccardo Pasquali, Adriana Bernardi, Antonio Galgaro  
The paper is uploaded in the project website at the address: [geo4civhic.eu/wp-content/uploads/2020/05/Assessing-grouting-mix-thermo-physical-properties-for-shallow-geothermal-systems-presentation.pdf](https://geo4civhic.eu/wp-content/uploads/2020/05/Assessing-grouting-mix-thermo-physical-properties-for-shallow-geothermal-systems-presentation.pdf)
  - **European drillability mapping for shallow geothermal applications**  
Partners involved: **UNIPD, UPV, UBeG, HYDRA, GEOSERV, GEOGREEN, FAU, RED, CNR-ISAC**
  
- ❑ June 29<sup>th</sup> 2020 - EUSEW Energy Day – **“Very Shallow Geothermal Energy: A Sleeping Giant of the Energy Revolution”**. This energy day was hosted by the Friedrich-Alexander-Universität Erlangen-Nürnberg **FAU** - working group Shallow Geothermal Energy - Dr David Bertermann and co-hosted by **BayFOR**. All the presentations of the online event are also available at the link: [www.bayfor.org/presentations-geothermal-revolution](http://www.bayfor.org/presentations-geothermal-revolution).
- ❑ September 3, 2020 – International workshop (online) **“Shallow Geothermal: a promising renewable resource for heating and cooling”** in the frame of the Euro Science Open Forum ESOF 2020 Trieste (Italy); Partners involved: **TECNALIA, UBeG, CNR-ISAC, RGS**
- ❑ September 3<sup>rd</sup> 2020 – **BRENET Conference 2020** (Aarau, Switzerland);



- September 7<sup>th</sup> – 10<sup>th</sup> 2020 – **FOREN 2020 WEC Central & Eastern Europe Energy Forum** (online, Romania).

With this occasion, the WP8 responsible partner, **RGS** presented the article: **“Trends in the European Research in the domain of Heating and Cooling Systems with Geothermal Heat Pumps – research projects financed by the European Commission (CHEAP-GSHPs and GEO4CIVHIC)”** having as authors the project team members: Robert Gavriiuc, Doina Cucueteanu and Tiberiu Catalina. The article is uploaded in the project website: <https://geo4civhic.eu/wp-content/uploads/2020/10/RGS-for-FOREN-2020-Final.pdf>
- September 21<sup>st</sup> 2020 – Conference **“ArtEclima: tra emergenze e difesa dei nostri Beni Culturali”** (Rome, Italy). Senato video: [http://webtv.senato.it/4623?video\\_evento=110701](http://webtv.senato.it/4623?video_evento=110701) ; [https://www.facebook.com/events/335872351197006/?fbclid=IwAR1YYbtGJG6E4YzkUbBGNpDvA5EzCEtD\\_AhaNQIEaZITfrv1siDxhfvSu1U](https://www.facebook.com/events/335872351197006/?fbclid=IwAR1YYbtGJG6E4YzkUbBGNpDvA5EzCEtD_AhaNQIEaZITfrv1siDxhfvSu1U)
- November 30<sup>th</sup> 2020 – International workshop **“Shallow geothermal energy from the ground to buildings, from the field to modelling”** (online Italy);
- November 27<sup>th</sup> 2020 – Seminar **“ITC - Progetti di ricerca europei”** in the frame of **“La note europea dei Ricercatori”** organized by **CNR-ITC**. <https://www.facebook.com/NdRCnrPadova/>;
- November 30<sup>th</sup> - December 3<sup>rd</sup> 2020 – **UNIPD** participated to the online Workshop organized by **ENeRAG** project **“Shallow geothermal energy: from the ground to buildings, from the field to modelling”**.
- December 11<sup>th</sup> 2020 – Conference **“Building Back Better: A Future for Geothermal Energy in Northern Ireland”** – **GEOSERV** presented an article **“Presentation of a HORIZON 2029 project - GEO4CIVHIC and the case study sites”**.
- January 20<sup>th</sup> 2021 - Conference **“Market access in Kazakhstan in the sustainable energy sector”** organised by UNIDO (online, UNESCO participation) - <https://www.unido.it/FIPEE/news.php?&id=1303>
- February 15<sup>th</sup> – 16<sup>th</sup> 2021 – **“12<sup>th</sup> European Geothermal Days”** (online – Paris, France);

On this occasion, partners from **CNR** and **UNIPD** presented the poster **“Preliminary findings in the Assessment of the Critical radius of Ground heat Exchangers: a Factorial design Approach.”** Authors: Gianluca Cadelano, Giorgia Dalla Santa, Eloisa Di Sipio, Adriana Bernardi, Giovanni Ferrarini, Paolo Bison, Alessandro Bortolin, Antonio Galgaro.
- March 4<sup>th</sup> 2021 – Conference **UNESCO World Engineering Day for Sustainable Development** **“Engineering a Healthy Planet”** - <https://events.unesco.org/event?id=3644211148&lang=1033>
- March 24<sup>th</sup> – 25<sup>th</sup> 2021 – Conference **“Artificial Intelligence in Architecture, Engineering and Construction”** (virtual, Spain, **Tecnalia**).



In the reported period of time M25-M36, one scientific article was published in scientific journal **GEOTHERMICS Journal – Elsevier 2020**:

**“An updated ground thermal properties database for GSHP applications”** having as authors the following members of GEO4CIVHIC scientist team: Giorgia Dalla Santa, Antonio Galgaro, Raffaele Sassi, Matteo Cultrera, Paolo Scotton, Johannes Mueller, David Bertermann, Dimitrios Mendrinos, Riccardo Pasquali, Rodolfo Perego, Sebastian Pera, Eloisa Di Sipio, Giorgio Cassiani, Michele De Carli, Adriana Bernardi.

Partners involved: **UNIPD, CNR – ITC, CNR-ISAC, FAU, CRES, GEOSERV, SUPSI.**

In **Energies 2020, 13(21), 5654** was published the article **“A Novel Ground-Source Heat Pump with R744 and R1234ze as Refrigerants”** having as authors the following scientists: Emmi, G.; Bordignon, S.; Carnieletto, L.; De Carli, M.; Poletto, F.; Tarabotti, A.; Poletto, D.; Galgaro, A.; Mezzasalma, G.; Bernardi, A. Energies 2020

Partners involved: **UNIPD, CNR-ISAC, DLH, GALLETTI, RED.**

All the articles / presentations / posters listed above are integrally included in the project website.

In the reported period of time M25-M36, some articles written by the project partners and describing different scientific and technic project aspects were prepared for future events.

For example:

- ❑ A paper written by **CNR-ITC** specialists were submitted and accepted for the **International Refrigeration and Air Conditioning Conference** – which will take place in May 23<sup>rd</sup>-27<sup>th</sup>, 2021, at Purdue University, West Lafayette, USA.
- ❑ **UBeG** submitted in Nov. 2020 an extended abstract to **ENERSTOCK 2021** that will take place in Ljubljana in June 2021 (held virtually); meanwhile the abstract was accepted as poster with short oral introduction.
- ❑ **FAU** prepared a large description of the research results in the article: **“Innovative Helicoidal Ground Source Heat Exchanger Coupled with a New Timesaving Installation Technique”** for the **World Geothermal Congress 2020+1** – Reykjavik 2021.

### 2.3 Other implemented dissemination activities



THYSSEN edited and disseminated a product flyer “VibroDrill VD80 / 105”, equipment created using the research results from GEO4CIVHIC project.





The GEO4CIVHIC project coordinator Adriana Bernardi was interviewed by UNESCO about COVID-19 impact on her work and personal life and on women scientists, in general. As head of the Padua unit of CNR-ISAC and coordinator of GEO4CIVHIC project, Adriana presented the difficulties induced in the research projects by the pandemic.

<https://en.unesco.org/news/covid-19-and-impact-women-scientists>.

The Romanian Ministry for Investments and European Projects included the projects **Cheap-GSHPs** and **GEO4CIVHIC** in its website among the “**best practice examples**” directly managed by the European Commission.

### 3. Final conclusions on the TED activity developed in M25-M36

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The main conclusions regarding the TED activity in M25-M36 are the following:

- In the given situation of Covid-19 pandemic, the partners made a **special effort to implement** with efficiency the dissemination tasks assumed in the project TED plan. The reporting period completely overlapped with the pandemic, which greatly affected the mobility of people and work teams, the activity of researchers, work on demo sites.
- The dysfunctionalities had a major impact on the direct, face-to-face communication between partners as far as the face-to-face management meetings could no longer be organized. The effort of the partners focused on **online meetings, teleconferences, skype meetings** had up to the end a satisfactory efficiency, but were disproportionately time consuming.
- The organization of countless online meetings has posed great problems in harmonizing the time available between partners, which has often led to discussions on sub-groups of responsible partners for specific WPs and Tasks and sub-Tasks. As a conclusion, the **volume of work in this “frozen” year was higher than in a normal year from many points of view.**
- The cancellation of some of the national and international events where the partners had registered and for which they prepared communications and scientific papers **will continue to affect the implementation of the TED plan** in the next months, which will force the partners to a significant additional effort in the next period of time up to the end of the project.
- An unsolved aspect was generated by the **payments already done for the participation and travel to different cancelled or postponed events in 2020**, payments that were not recovered.
- However, in the given situation and in the perspective of the GA addendum which will state the extension of the project duration and the corresponding postponement of some of the activities, in the M25-M36 period of time, **no negative deviations** from the TED Plan of the project, meaning delays, appeared. Due to the previous assertions, **no corrective actions are necessary.**
- Moreover, three categories of actions are in **advanced stage** registering **positive deviations**:
  - Preparation of training tools elaboration,
  - Organization of European Centres of Excellence;
  - Participation in standardization bodies.

## References

N/A

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