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DRAFT

Project Plan for the CEN Workshop on “*Design and installation guidelines for a building retrofitting concept based on EGS (enhanced geothermal systems)*” WS number or WS Acronym: GEOFIT

Workshop (to be approved during the Kick-off meeting on 2022-03-29)

The content of the Project Plan is structured into chapters. These chapters represent the Project Plan’s minimum content. There is no restriction on the addition of further chapters if this is deemed useful.

1. Status of the Project Plan

- Initial draft Project Plan, to be further developed, prior to submission for approval
- Draft Project Plan to be approved at the Kick-off meeting of the Workshop
- Approved Project Plan

2. Background to the Workshop

- Market and legal environment

In Europe, the building sector is responsible for the 40% of the total energy consumption and represents about a third of Europe’s CO₂ emissions. Heating and cooling accounts for 50% of this EU annual energy consumption, making it the biggest energy end-use sector ahead of both transport and electricity¹. This is a huge socioeconomic and environmental problem, if we consider that roughly 75% of buildings in the EU are not energy efficient², and that approximately 75% of heating and cooling is still generated from fossil fuels (Eurostat 2019). On this basis, buildings also represent a large energy-savings potential, once renovated and upgraded, being crucial that the heating and cooling sector sharply reduce its energy consumption and cut its use of fossil fuels to fulfil the EU’s climate and energy goals. However, today the annual renovation rate of the building stock varies just from 0.4 to 1.2% in the Member States. According to the European Green Deal, this rate will need at least to double to reach the EU’s energy efficiency and climate objectives.

Given the labour-intensive nature of the construction sector, which is largely dominated by local businesses, building renovations can also play a crucial role in European economic recovery

¹ <https://ec.europa.eu/energy/topics/energy-efficiency/heating-and-cooling>

² <https://ec.europa.eu/energy/topics/energy-efficiency/energy-efficient-buildings>



after the COVID-19 pandemic. To kick-start the recovery, the Commission's recovery plan intends to further support renovations for EU buildings².

To pursue this dual ambition of energy gains and economic growth, in 2020 the Commission published a new strategy to boost renovation called "A Renovation Wave for Europe – Greening our buildings, creating jobs, improving lives". Also, the EU has established a legislative framework (that includes the Energy Performance of Buildings Directive 2010/31/EU (EPBD) and the Energy Efficiency Directive 2012/27/EU), giving a direction to the future of sustainable energy use and supporting the Low Carbon Energy in Buildings.

In this context, Shallow Geothermal Energy (SGE) represents a renewable energy source (RES) with a large potential of energy savings and GHG emissions reduction in the building sector to achieve all major objectives of the EU's energy policy. Moreover main reference organisations - such as ECTP³ and RHC-ETIP⁴ - have effectively promoted and road-mapped the cost-effective integration of renewable energy sources (RES) into building technical systems, considering the development of effective and affordable enhanced geothermal systems (EGSs) crucial to exploit the EU geothermal potential as major source of energy supply for heating and cooling purposes, by targeting the bottlenecks that hinder full deployment of geothermal systems as one of the key concepts in energy efficient building retrofiting.

On this basis, the objective of this CEN workshop, motivated by the main goals of the innovation EU H2020 GEOFIT Project (funded under grant agreement number 792210), is to develop specific guidelines that aid to the viable and cost effective use of advanced EGS by introducing a novel concept on building retrofiting based on geothermal energy and EGS, through the integration and validation of a suite of technologies, tools and methods facilitating their easy application and massive deployment.

- Existing standards and standard related activities and documents

The following standards, standardization activities and documents have been identified as the most representative ones for this CEN Workshop:

prEN 17522	Design and construction of borehole heat exchangers
EN 15450	Heating systems in buildings - Design of heat pump heating systems
EN 12828+A1	Heating systems in buildings - Design for water-based heating systems
EN 14336	Heating systems in buildings - Installation and commissioning of water-based heating systems
EN ISO 11855 series	Building environment design - Design, dimensioning, installation and control of embedded radiant heating and cooling systems
ISO 15392:2019	Sustainability in buildings and civil engineering works — General principles

³ ECTP European Construction, built environment and energy efficient building Technology Platform

⁴ RHC-ETIP European Technology and Innovation Platform on Renewable Heating and Cooling



- **Motivation for the creation of this Workshop:**

This workshop is motivated by the currently ongoing Horizon 2020 GEOFIT project (Deployment of novel GEOthermal systems, technologies and tools for energy efficient building retroFITting), whose general objective is the implementation of a global, effective, energy-efficient retrofitting strategy for the stock of existing buildings in Europe, boosting the adoption of appropriate geothermal based energy-efficient building retrofitting technologies and methods.

The creation of this CEN Workshop was identified by the project consortium as a very useful way to disseminate the GEOFIT project findings and results, in accordance with the dissemination activities carried out to facilitate the acceptance and utilization by the market of the developed solutions through the interaction with the standardization system. This CEN Workshop will allow the drafting and issuing of a CEN Workshop agreement (CWA) including some GEOFIT results, as well as supporting the ongoing and future GEOFIT activities.

3. Workshop proposers and Workshop participants

The CEN Workshop is proposed by the GEOFIT project consortium. This project has received funding from the European Union's Horizon 2020 research and innovation program under grant agreement No. 792210.

The proposers of the CEN Workshop are specifically the following partners in the GEOFIT project: R2M (Coordinator of GEOFIT), COMSA, NUI GALWAY (National University of Ireland). The proposers specifically work on activities related to sustainable design in retrofitting buildings, with the integration of shallow geothermal GSHP (ground source heat pump) systems. R2M serve as GEOFIT coordinator and innovation manager, and its activities are specifically focused in consulting on building and systems energy, retrofit strategies and solutions with associated design. NUI GALWAY is leading the activities related to the overall system and building integration and efficient management (including EGS, GSHP and H/C systems), likewise COMSA leads the task of creating the guidelines with inputs from all the other partners. COMSA activities within GEOFIT are also focused on the coordination of implementation of the innovative and integrated geothermal system solutions in five pilot sites in four countries (Ireland, France, Italy and Spain).

Several other partners of the GEOFIT project will take part in the development of the CEN/CENELEC Workshop Agreement, e.g.:

- ARAN ISLANDS ENERGY COOPERATIVE (Ireland)
- CONSIGLIO NAZIONALE DELLE RICERCHE (Italy)
- FAHRENHEIT GMBH (Germany)
- IDP INGENIERIA Y ARQUITECTURA IBERIA SL (Spain)
- IDS GEORADAR SRL (Italy)
- I. LECO (Belgium)
- UPONOR OYJ (Finland)

The Workshop will be open to experts willing to contribute. Some experts/representatives have been identified beforehand and will be invited to take an active part in the WS deliberations.



Participation in the CEN Workshop is open to everyone, and the opportunity to participate is advertised prior to the kick-off meeting by its proposers and the CEN official channels.

4. Workshop scope and objectives

The consortium of the GEOFIT H2020 project (funded by the EU under Grant Agreement 792210) has been intensively working during 4 years on an integrated industrially driven action Building Energy Management System aimed at the deployment of cost effective enhanced geothermal systems (EGS) on energy efficient building retrofitting. This action includes the use of 5 demonstration sites as open case studies in 4 CEN member states and corresponding different climates, featuring different representative technical scenarios/business models.

The purpose of this CEN workshop is to agree, on the base of the GEOFIT acquired know-how and experience, well-defined guidelines for the implementation and managing of a novel concept on building retrofitting based on EGS (enhanced geothermal systems), focusing on the integration of efficient easy-to-install H/C (heating and cooling) system, cloud-based BEMS (Building Energy Management System) and grid flexibility. The most important challenge to face is to provide tools and methods to all stakeholders in the building retrofit process, facilitating the application of this solution across CEN member states, pursuing optimal indoor environment and energy efficiency. The main goal is to ensure that these guidelines will be provided by type of building, type of system, type of soil, surrounding environment and level of post-retrofit performance to be achieved.

The delivery of a CWA from this CEN workshop is foreseen. The proposed CWA will not define requirements related to safety aspects. The proposed CWA will not include guidelines for the specific design and construction of borehole heat exchangers.

In relation with dissemination, the draft CWA will be submitted to a 30 days public commenting phase through the CEN webpage. Finally, the CWA will be available for free download from CEN-CENELEC webpage (CWA download area).

The potentially interested ISO and CEN technical committees indicated below (CEN/TC 451, CEN/TC 228, ISO/TC 59/SC 17, CEN/TC 350, CEN/TC 371, ISO/TC 205) have been informed about the intended CWA development for inviting their members to participate in the workshop in case of interest.

Also, the results obtained from this workshop will be disseminated throughout the specific GEOFIT website (<https://geofit-project.eu/>) and social media (Twitter and LinkedIn), and into the GEOFIT dissemination network, including the selected stakeholders and multipliers, such as the scientific community, technical experts, strategic experts and policy makers and the general public and end-users. This will be done according to the GEOFIT dissemination strategic plan, that may involve public events and activities, workshops and training and other media dissemination (TV, radio, press), among others.

5. Workshop programme



The CWA will be drafted and published in English.

Work plan

The CWA will be drafted and published in English.

The estimated duration of this Workshop is 6,5 months. During the Workshop lifetime, several online meetings and a public commenting stage are foreseen, as necessary.

The program to reach the CEN Workshop Agreement entails the following steps:

1. Organization of the kick-off meeting:

The CEN/CENELEC Management Centre (CCMC) will post the Project Plan, the invitation and the agenda for the kick-off meeting on the CEN/CENELEC Website for a period of 30 days. The interested parties will be able to register by email. In parallel, the invitation is forwarded to the GEOFIT stakeholders as well as to potentially interested experts previously identified.

Participation in the development of the CEN Workshop Agreement is open to anyone, and the opportunity to participate will be advertised in advance by its proposers, the GEOFIT network and by CEN. The Workshop Secretariat will register all interested participants.

The kick-off meeting of the CEN Workshop will take place on 2022-03-29 by teleconference.

The kick-off meeting will:

- approve the Workshop Project Plan;
- present and discuss the first draft of the CWA;
- approve Workshop Chair;
- discuss the general planning for the development of the CWA.

2. Circulation period of the base document, collection of comments, discussion and agreement by CEN/CENELEC WS participants. The participants will actively elaborate content, review incoming drafts and suggest changes as well as additions. Finally, the Chair will check by correspondence that the consensus has been reached on the final version of the CWA.

3. When the consensus is met, the CWA will be sent to the CEN/CENELEC Management Centre for a public commenting phase.

4. Comments received during the public commenting phase will be addressed, a meeting can be organized if comments cannot be resolved via email.

Estimated time schedule:

	Activities	Schedule
1	WS kick-off meeting + presentation of first draft of the CWA	2022-03



2	Elaboration and agreement on the draft CWA	2022-06
3	Public commenting phase	2022-08
4	Comments analysis and implementation, and delivery of final CWA to CCMC for publication	2022-09
5	Publication of CWA after editorial check by CCMC	2022-10

6. Workshop structure

The CEN Workshop will operate according to the CEN/CENELEC rules for the CEN Workshop Agreement.

- CEN Workshop chairperson

The chairperson will be formally appointed at the kick-off meeting by the parties present. The chairperson has five main responsibilities.

1. Organization of communication with CEN Workshop participants via the secretariat.
2. Monitoring CEN Workshop processes and CWA development progress.
3. Managing and assessing the consensus process.
4. Chairing online meetings and parts of the kick-off meeting.
5. Representation of the CEN Workshop and its results to the exterior.

- CEN Workshop secretariat

After the formal announcement of the proposed CEN Workshop, UNE (Spanish Standardization Body, CEN national member) will assume the Secretariat with the following duties:

1. To be responsible for administrative tasks of the CEN Workshop Agreement;
2. To form the administrative contact point for CWA project;
3. To follow up of Workshop decisions;
4. To advise on the requirements of the CEN/CENELEC Internal Regulations;
5. To keep a list of parties to be consulted in view of the maintenance phase and updating it with new expressions of interest.

All communication shall be copied to Secretariat and all participants to ensure transparency, openness and equal treatment of all stakeholders.

UNE will provide the Workshop secretariat subject to formal approval of the project plan at the kick-off meeting.

The CWA will also be published by CEN/CENELEC and made publicly available through CEN/CENELEC and different standardization Institutes in the member states at normal costs in line with the guidelines in Guide 10:2017-11. Additionally, the CWA, as is in the R&D domain,



will be available for free download from CEN-CENELEC webpage (CWA download area) after the corresponding pre-payment.

7. Resource requirements

- Costs of the CEN/CENELEC Workshop

The administrative costs of the CEN/CENELEC Workshop will be covered by resources from the GEOFIT project. The copyright of the final CEN Workshop Agreement will be at CEN/CENELEC. The final document will include the following paragraph: "Results incorporated in this CEN/CENELEC Workshop Agreement received funding from the European Union's HORIZON 2020 research and innovation program under grant agreement number 792210".

- Participation and registration fee

Both registration and participation at the CEN/CENELEC Workshop described here are free of charge. The use of electronic meetings will be preferred. Nevertheless, in the case of physical meetings, they will be held in Europe and each participant has to bear his/her own costs for travel, accommodation, and subsistence.

8. Related activities, liaisons, etc.

UNE has made a scan to verify the existence of standardization technical committees, existing standards and standards under development related to the above-described characteristics.

No standards or standards under development have been found, neither at European or International level. There is an active work item "prEN 17522 Design and construction of borehole heat exchangers" at European level, now with status "under approval", within the CEN/TC 451 (Water wells and borehole heat exchangers), but the intended scope of the proposed CWA does not overlap with it.

In the same way, the scope of the intended workshop falls into the scope of neither European nor International technical committees.

At European level, the following technical bodies have been contacted just for their information about the proposed workshop and the envisaged CWA:

- CEN/TC 228 - Heating systems and water based cooling systems in buildings
- CEN/TC 451 - Water wells and borehole heat exchangers
- CEN/TC 350 - Sustainability of construction works
- CEN/TC 371 - Energy performance of buildings

At international level, the following technical bodies have been contacted also just for their information:

- ISO/TC 59/SC 17 - Sustainability in buildings and civil engineering works
- ISO/TC 205 - Building environment design



9. Contact points

Such as Workshop Chairperson, Workshop Secretariat, Editors, CCMC contact, etc.

Proposed Chairperson:

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