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SEREINE

Evaluation Solution for Intrinsic Energy Performance (SEREINE)

*Real performance measure
for buildings once completed and
handed over*

Call for Expression of Interest (CEI)

Methods for measuring overall insulation levels in single-family homes

CEI led by Agence Qualité Construction (AQC)

1 GENESIS AND PRESENTATION OF THE SEREINE PROJECT

The Evaluation Solution for the Intrinsic Energy Performance of buildings (SEREINE) 1 project was developed as part of the innovation sector's programme in favour of energy savings in the construction and housing industry, PROFEEL (<http://programmeprofeel.fr>). The project was spearheaded by Agence Qualité Construction (AQC), while the Scientific and Technical centre for Building (CSTB) was responsible for its technical coordination. The other partners associated with the project are: The French Mines schools' research and technical organisation (Armines); Centre for Risk Studies and Expertise Assessments (Cerema); Scientific and Technical Committee for the Heating, Ventilation and Air Conditioning Industries (COSTIC); National Solar Energy Institute - Training and Assessment Platform (INES PFE); and Nobatek-INEF4, an applied research centre for energy and environmental transition in the construction industry. Together, they make up the SEREINE consortium.

The SEREINE 1 programme has developed a solution to measure the energy performance of new-build and refurbished homes once handed over to the client. This solution includes a method for measuring the overall insulation of the building envelope as well as a process for evaluating the performance of heating, domestic hot water, ventilation, air exchange and lighting equipment.¹

The SEREINE solution was delivered at the end of 2021. Since then, it is possible to incorporate the SEREINE measurement as an option to enhance the certification benchmark by CERQUAL Qualitel Certification for single-family homes. Furthermore, the SEREINE project has been extended over three years (2022-2024) under the name “**SEREINE 2**”.

The Consortium is mindful of the existence of methods with a similar principle. It therefore, wishes to propose that a mapping be created of the methods for measuring the overall insulation level in order to provide end users and public authorities with a comprehensive vision of the existing solutions.

The purpose, therefore, of this **CEI is to identify and select methods for measuring the overall insulation level of the building envelope of single-family homes** in order to characterise and objectively analyse them scientifically and operationally.

As part of the characterisation of the methods, a test phase will be set up in which the selected methods will be tested on around twenty single-family homes under real conditions. To enable the most objective mapping possible of the selected methods and those of the consortium, these will be tested on the same houses. A co-heating² test will also be conducted on each of these houses. It will allow the result obtained to be compared with the method currently considered as the reference in the scientific community and used to evaluate a building's level of insulation. Please note that in order to perform the co-heating test, it will be impossible to use the building for a period exceeding one week.

¹ The SEREINE 1 deliverables are available here in French: <https://programmeprofeel.fr/ressources/les-outils-pour-comprendre-la-methode-de-mesure-sereine-4-guides/>

² Geert Bauwens, Staf Roels, Co-heating test: A state-of-the-art, Energy and Buildings, Volume 82, 2014, Pages 163-172, ISSN 0378-7788, <https://doi.org/10.1016/j.enbuild.2014.04.039>

2 CALL FOR EXPRESSION OF INTEREST: METHODS FOR MEASURING THE OVERALL LEVEL OF INSULATION

1. The expected deliverable:

The purpose of this CEI is to obtain an objective analysis of the methods for measuring the overall insulation level of the building envelope, including those promoted by consortium members.

This analysis will take the form of a mapping of the methods, which will help the future client, whether a private or professional contracting authority, developer or a construction company, to move towards the method that best suits its needs. This mapping will also help public authorities in choosing methods based on their needs.

With the mapping, it will therefore be possible to characterise existing methods according to different criteria (for example, the period during which the building cannot be used, level of uncertainty, implementation, cost, how the data will be used, etc.), which must be defined before the launch of the search.

The analysis work done by the SEREINE consortium and the Scientific and Technical Centre for Construction (CSTC) is based not only on the results of the measurements conducted on site but also on more exhaustive elements presented by applicants (public scientific reports and articles, 'private' working documents, algorithms, source codes, etc.) and will take the form of a method qualification matrix based on the elements provided.

2. The CEI process:

- Launch of the CEI: 29 June 2022
- Closure of the CEI: 16 September 2022
- Selection of methods accepted: 17 October 2022

3. The analysis and preparation of the mapping:

- Launch meeting for the analysis and mapping work (technical exchange): 4 November 2022
- Meeting to exchange views regarding the conditions for the analysis (legal exchange): 18 November 2022

The technical and legal requirements for preparing the mapping must be set within a maximum of two months. These requirements will concern, in particular, the sharing of scientific information, defining the evaluation criteria, the confidentiality of the shared elements and the degree of transparency regarding the results, and the form of the final mapping, etc.

This two-month setting-up period will be the opportunity to search for some twenty test sites available for a long period on which to perform the different measurement methods as well as the co-heating test, which will be used as the benchmark in analysing the other methods. The test houses will be located in France in priority; however, an expansion of this scope may be envisaged, discussed and validated between all applicants participating in the mapping work.

- First tests: from the start of 2023.

Applicants whose methods have been selected will remunerate the operators in charge of implementing their methods on the expected twenty houses. Likewise, applicants must provide the equipment that will be used to conduct its method.

In some cases, the equipment and measurement operators may be pooled, with the agreement of the selected applicants concerned.

The meeting to exchange ideas regarding the analysis conditions will also determine, on the one hand, how the liability will be shared between the operator and the applicant regarding the safety of the building during the measurements and the safety of the equipment used (defect, theft or breakage) and, on the other hand, the insurability of the measurements to be taken.

Applicants will not bear the cost of the co-heating measurements or for implementing the methods promoted by members of the consortium.

4. Commitments of the successful applicants

Successful applicants of the CEI undertake to:

- Justify ownership or joint ownership of the method;
- Provide description elements that are useful in characterising their method;
- Share their feedback on the implementation of their method;
- Participate in the mapping work by providing all the data and material necessary for implementing their method.

3 HOW TO APPLY FOR THE CEI

To apply for this CEI, applicants must submit their application by email to the following address: sereine@qualiteconstruction.com.

The application must include a letter of their motivation to participate in the mapping exercise and some preliminary technical elements relating to their method (see Section 4 below).

4 SELECTION PROCESS

Successful methods for measuring the overall level of insulation must meet the following criteria:

- The method must be applicable to the single-family housing sector - whether new-build, existing (pre-work) or refurbished houses.
- The method must allow the overall insulation level of the building envelope to be measured. The indicators measured must be clearly explained and must *at least* allow the HLC to be assessed.

- The methodology used to characterise and assess the uncertainty interval of the measurement must be explained and documented.
- The method must be applicable across Metropolitan France. The ideal period of the year for its application must be specified.
- The duration for implementing the measurement must be stated. It must be limited to three months, ideally.
- The method must have been validated by tests on real sites in order to confirm its operationality.
- The method must be mature enough to envisage its operation at the end of 2024.

The fact that the applicant also provides test houses on which its own method as well as all the other selected methods could be applied will be an asset.

5 CEI TIMETABLE FOR SEREINE OPERATORS

STEP 1 <i>Receipt of applications</i>	STEP 2 <i>Selection and launch</i>	
16/09/2022	Selection of the methods accepted	Launch of the analysis and mapping exercise
	17/10/2022	04/11/2022

Successful applicants will be invited to an initial meeting to define the analysis criteria and launch the process. The meeting will be chaired by the Scientific and Technical Centre for Construction (CSTC), a Belgian research institute.

6 CONTACT

For enquiries about this CEI, please send an email to the following address:
sereine@qualiteconstruction.com.

