

Using the building certification methodology of another country: What have we learned?

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Towards reliable, practical, and people-centred European energy performance certification of buildings.

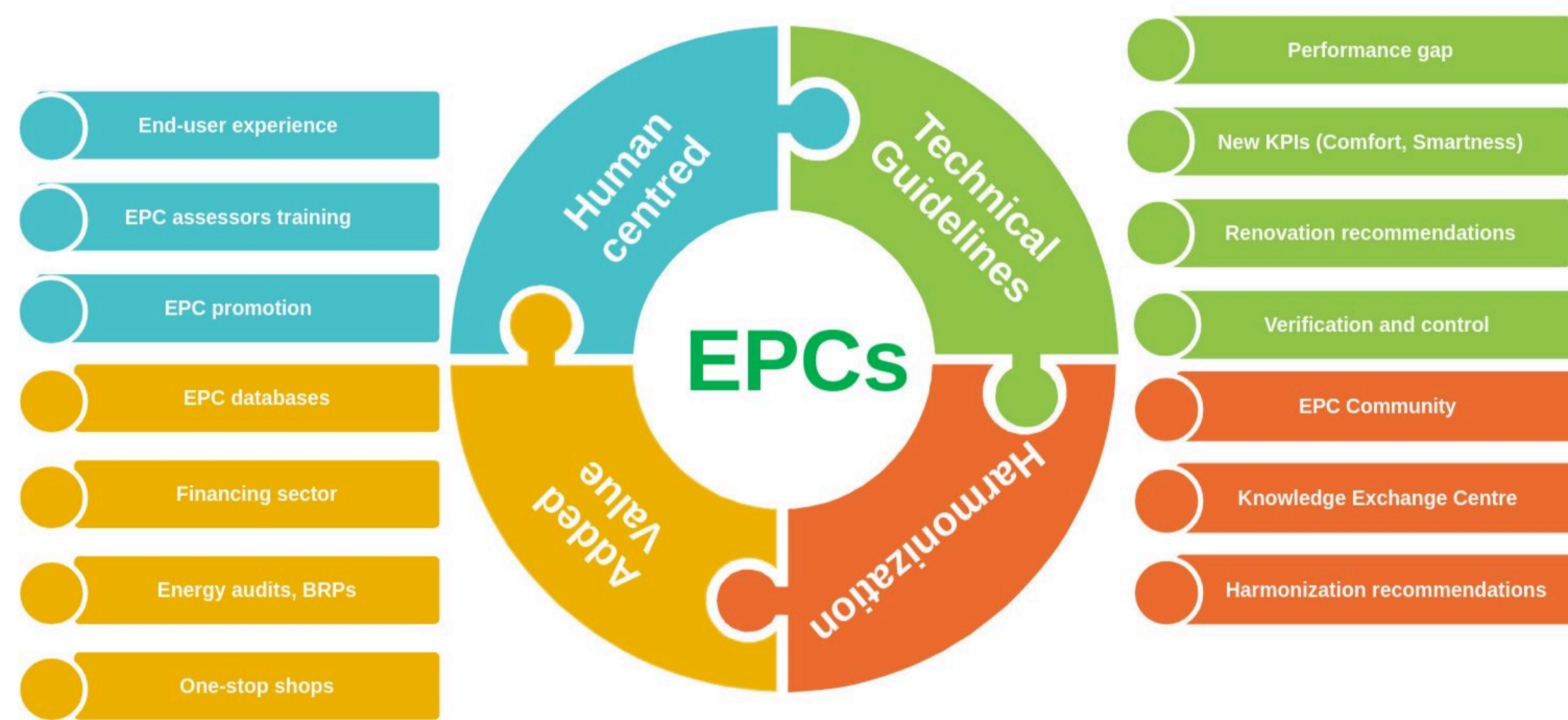
Objectives

CrossCert is committed to contributing to the success of the next-generation Energy Performance Certificates (EPCs) by developing and testing guidelines and recommendations that aim to achieve the following:

- ✓ Improved accuracy and usability of the certificate.
- ✓ A people-centric design and a satisfactory user experience.
- ✓ Increased homogeneity across Europe.

CrossCert will provide improvements and recommendations in all dimensions related to energy certification, which are classified as follows:

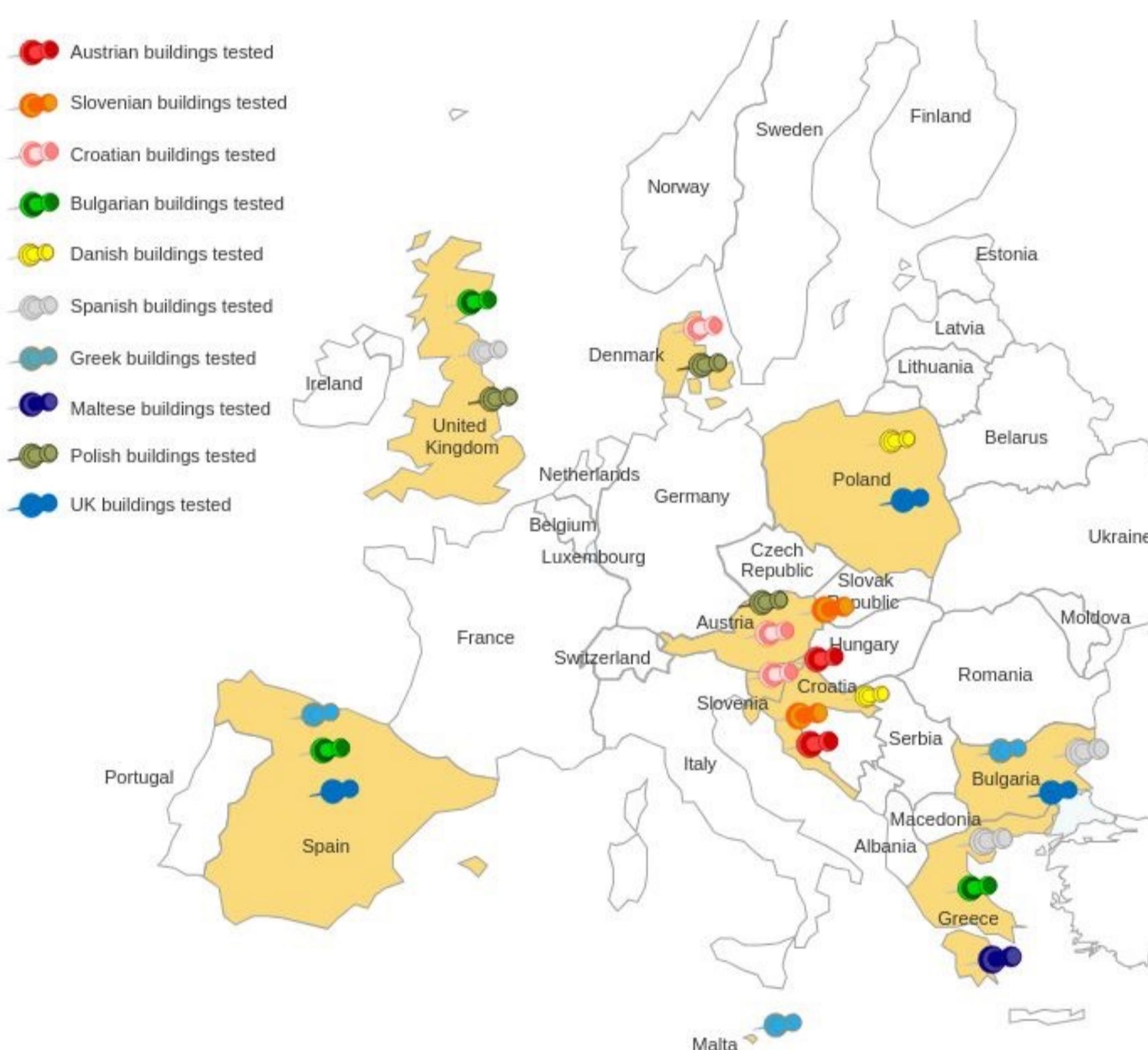
- Technical dimension.
- Human factor.
- Added value of energy certification (and connection with other instruments and tools).
- Harmonization of methodologies across Europe.



Methodology

Cross-testing involves calculating the energy performance of buildings using partners' national EPC calculation software. As a result of this exercise, we obtained an energy certificate for a building using the methodology of the country where that building is located (Home EPC), and another energy certificate applying the methodology of another country (Visiting EPC).

The results and the experience of using other EPC methodologies were compared, determining the differences between each certification procedure and the best practices applied in each country.



The methodology was applied to 140 buildings provided by crossCert partners. Several practical obstacles had to be overcome. These obstacles included widely varying climate conditions across countries (in most EPC software programs, it is not possible to import data for the climate prevailing at locations in other countries), language differences in EPC software, and differences in data requirements.

To overcome these obstacles, partners with similar climate conditions were identified and paired for cross-testing, while data requirements were compared and standardised.

The map shows how countries were paired according to climatic similarities and the buildings of other countries (Visiting EPCs) that each country has tested with its national methodology.

Results

Great variety of methodologies and input data

Energy certification methodologies used for buildings across Europe vary significantly. Each EPC method has different input data requirements or evaluations. For instance, in some countries, drawings are necessary, while this is not the case in others, or some countries evaluate lighting in the EPC, while others do not.

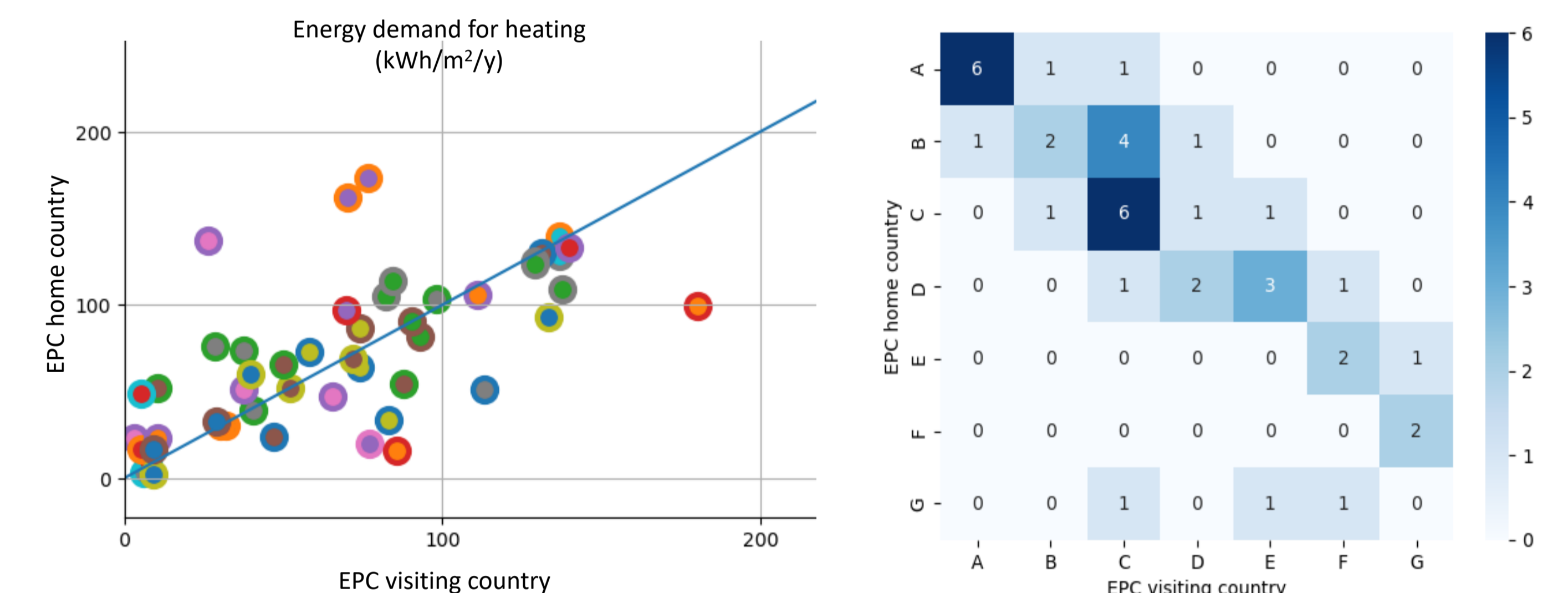
The approaches and hypotheses used to model elements and technical systems of the building also differ in each country. For instance, thermal bridges, user behaviour (occupancy, occupancy schedule, set point temperature, ventilation), U-values, or internal gains are generally determined differently in each country.

Consistent results despite the variety of approaches

There is a certain level of variation observed in the energy demand for heating (left) of the same building when methodologies from different countries are used.

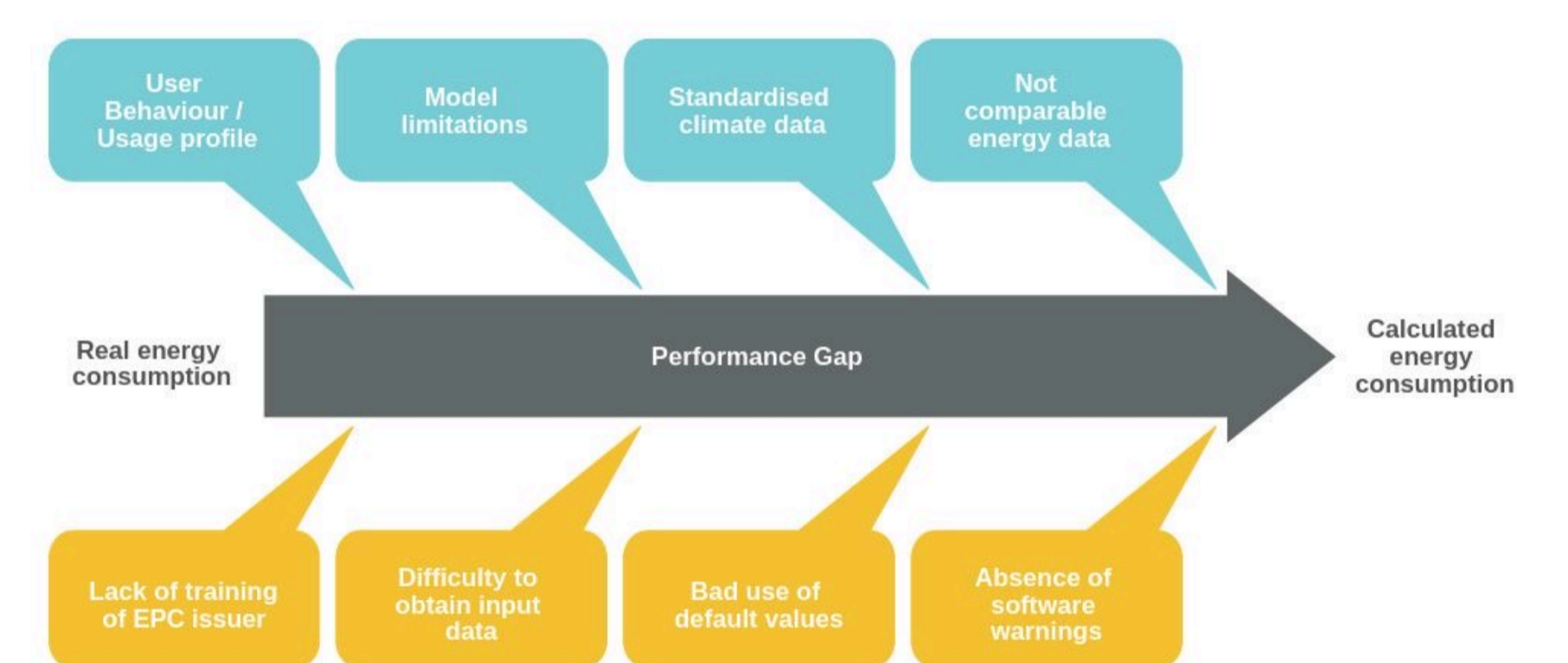
On the other hand, a good correspondence is observed between the ratings (letters) obtained with different methodologies (right). The chart numbers represent how often the home and visiting country labels agree.

This consistency is relevant for the establishment of common policies across Europe on the energy renovation of buildings or a common scale in energy certification.



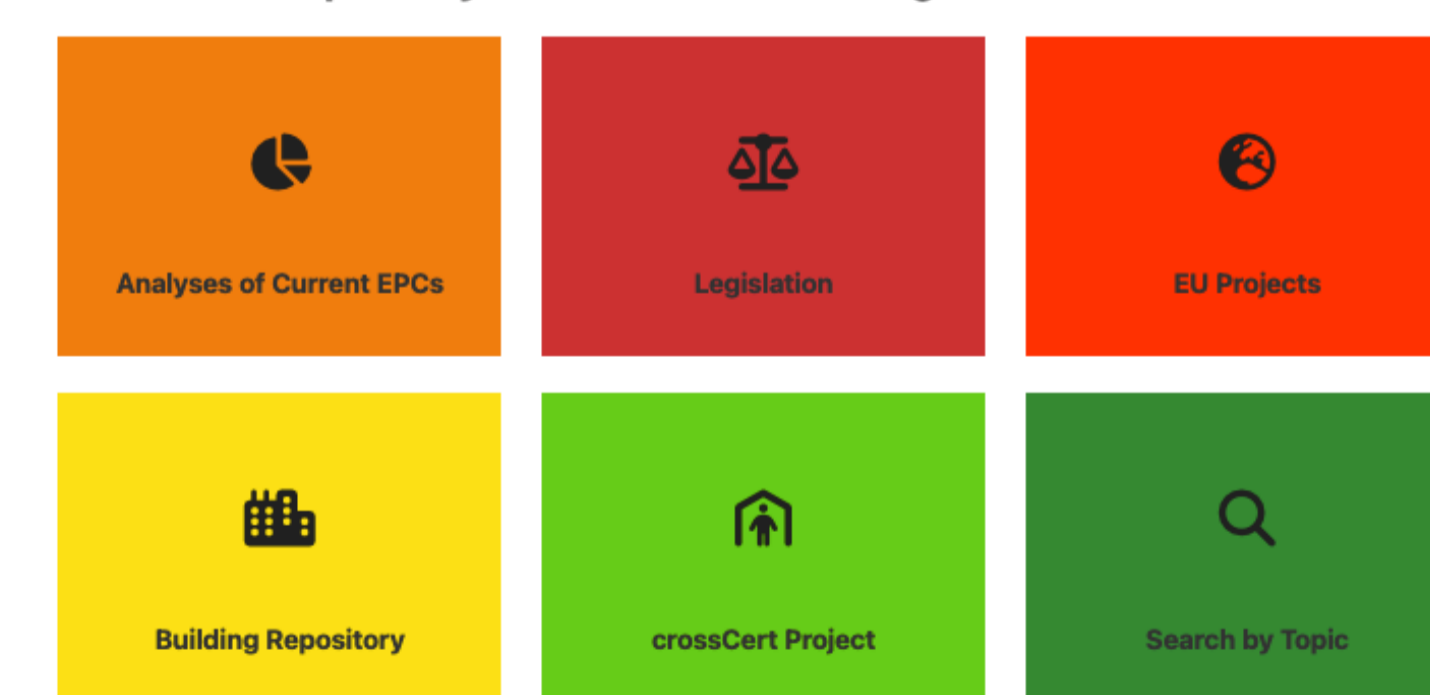
Performance gap causes

We have identified the reasons for the performance gap: the difference between the actual energy consumption in the building and the energy consumption determined by the energy certificates. We have classified the causes into two categories: those inherent to the certification methodology (blue balloons) and those due to the poor application of the methodology (orange balloons).



Knowledge Exchange Centre

Web-based repository of information on next generation EPCs



The Knowledge Exchange Center <https://crosscert.unizar.es/> is a web platform that facilitates the sharing of research articles, projects, and legislation on energy certification for buildings in a structured manner. Additionally, the platform includes a building data repository that developers and researchers can use to test software that calculates the energy performance of buildings.

More results on our website <https://www.crosscert.eu/> Stay tuned for more results!