



This project has received funding from the European Union's Horizon 2020 research and innovation programme under the grant agreement number 839937. The European Union is not liable for any use that may be made of the information contained in this document, which is merely representing the author's view.



U-CERT

User-Centred Energy Performance Assessment and Certification

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Measured building performance and operational rating

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U-CERT proposes a set of user-centred and effective indicators integrated in a dynamic EPC report, with a view to facilitate the EU-harmonisation by relying on the applicable EPB Standards, and increase user understanding and acceptance towards the increase of quality in the built environment, specially focusing on deep renovations.

What?

U-CERT proposes a set of **added value holistic indicators** contributing to the rebirth of next generation EPB Assessments.

Also, it designs a **new, dynamic, and user-centred EPC report**.



More information
Deliverable 3.2

How?

Learning from the **ethnographic research** performed **at each partner country**.

- **Needs and expectations** of expert and non-expert users.

More information
Deliverable 2.3

Leveraging the **indicator mapping** performed **at market level**.

- Identification of paths towards **holistic indicators**.

More information
Deliverable 2.4

Briefing findings

- Make **energy more intuitive** and **influence behaviour** of users.

Indicators covering **health, safety, convenience, well-being, and comfort** are valued by final users.

- Accommodate a **wide scope of use**.

Offer **several levels of complexity of user interface**.

Develop a **modular design** in combination with **digitalisation**.

Consider variable **building situation**.

U-CERT's EPC structure

U-CERT's EPC is built to behave as a **repository of indicators and complementary data**.

Depending on the type of user, some or all the information is disclosed.



Indicators

U-CERT Certification Scheme considers **four dimensions** of indicators:

- **Energy performance.**
- **Smart Readiness.**
- **Indoor Environmental Quality.**
- **Cost.**

Their inclusion in U-CERT's EPC report is **sensitive to the assessment type**:

Category	Indicators	Included in U-CERT's EPC	
		Calculated	Measured
Energy Performance	Overall EP indicators	X	X
	Partial EP indicators	X	-
Smart Readiness	SR	X	-
	ALDREN Thermal score	X	-
IEQ	ALDREN Thermal score	X	-
	Cost	-	X

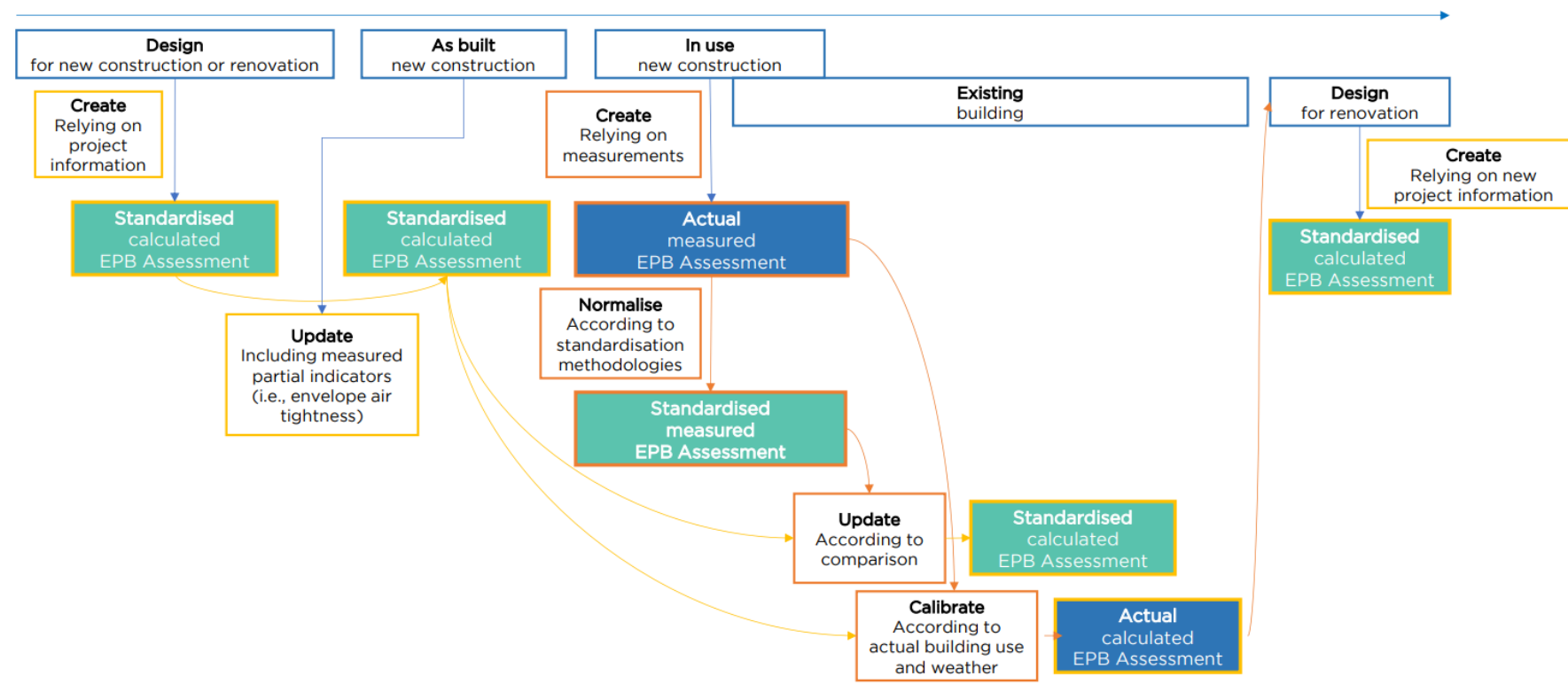
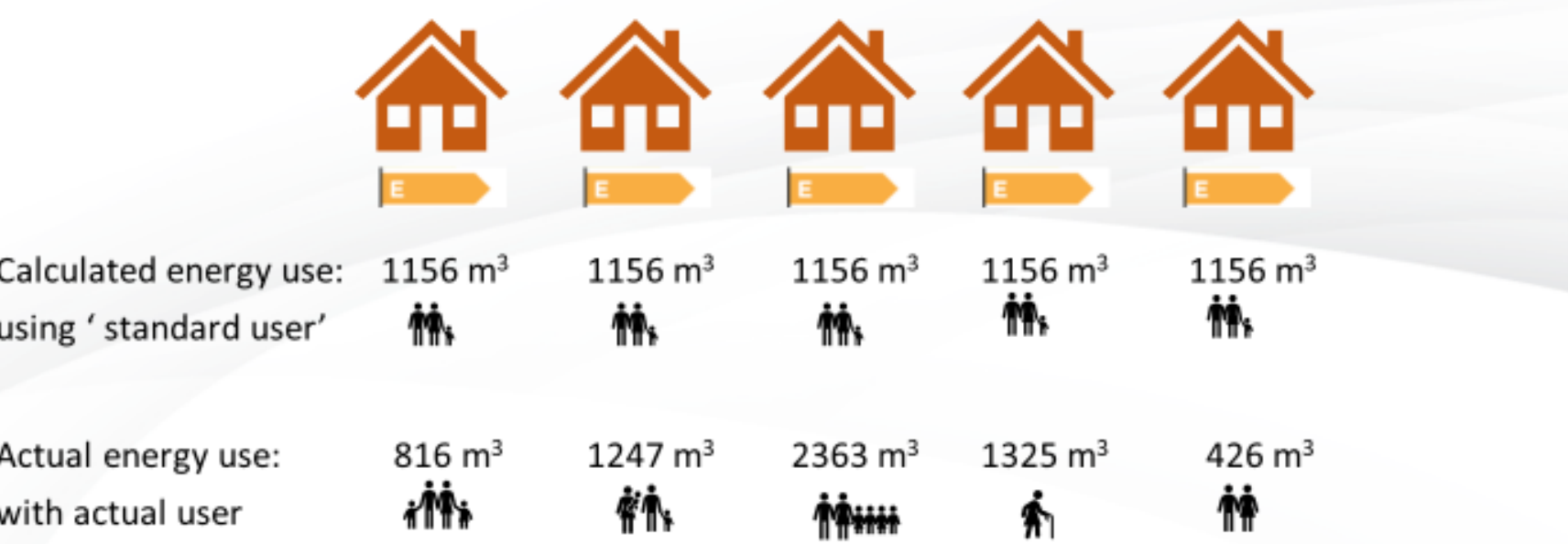
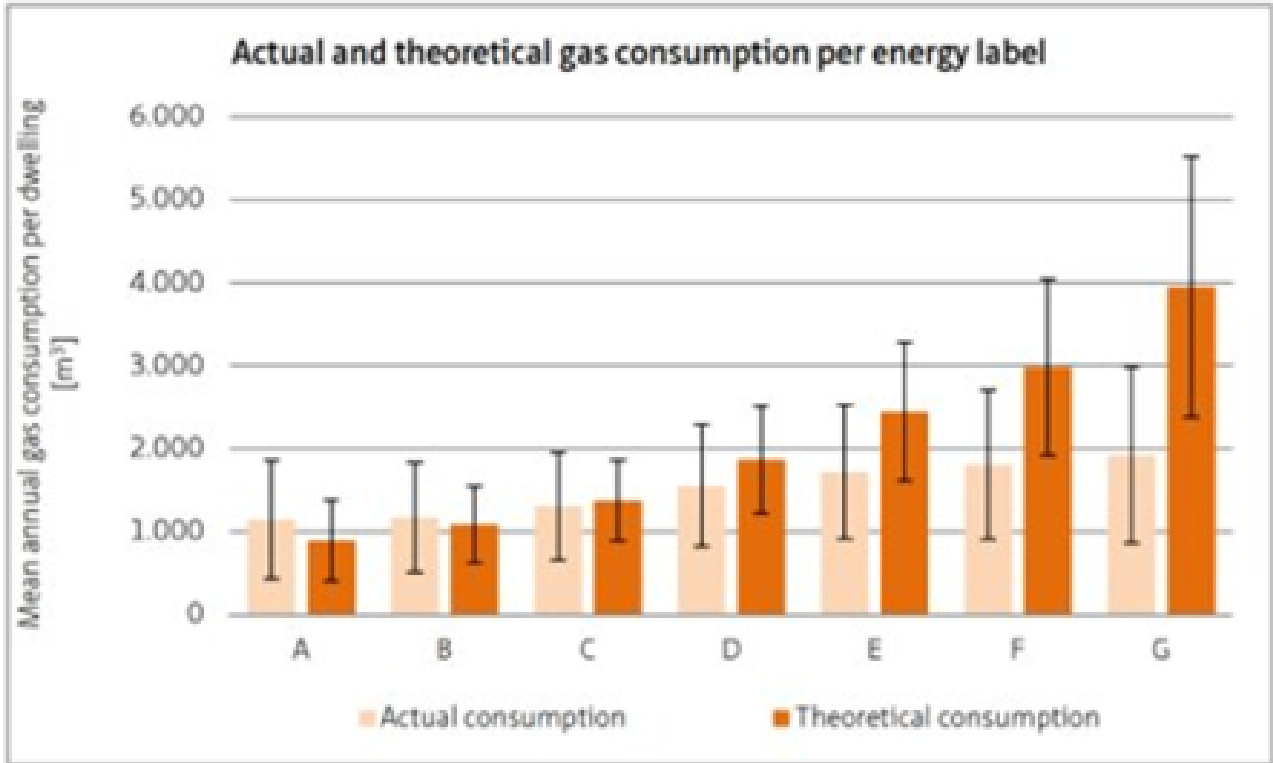


Figure 5. Interrelation of EPB Assessment types during a building's lifecycle

Large differences of energy use between neighbours



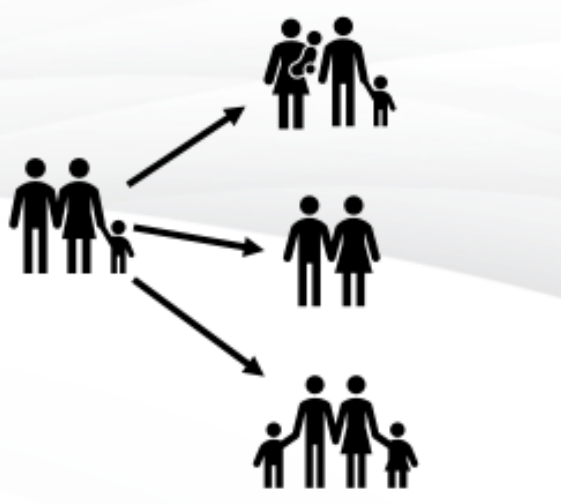
Gap between actual and theoretical energy use



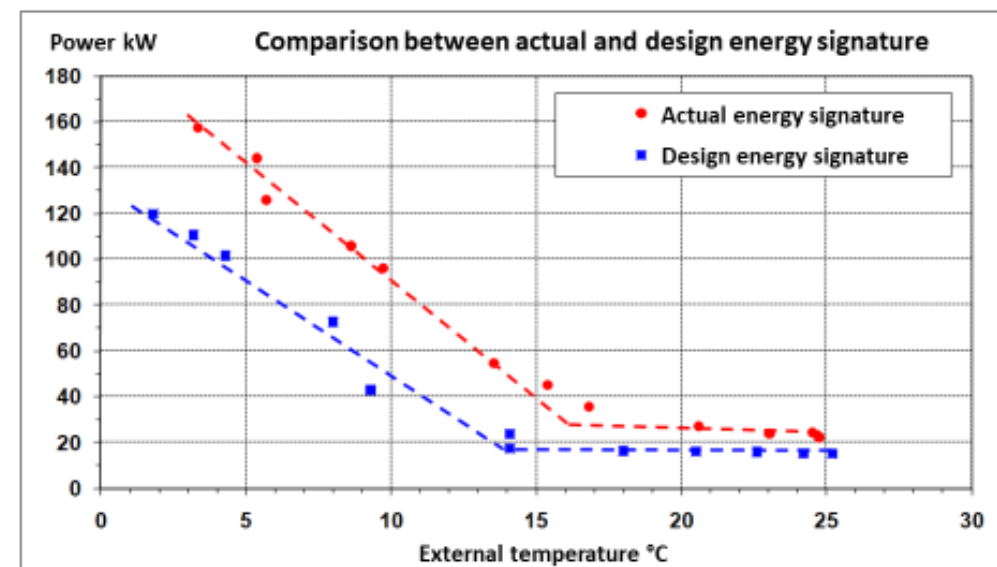
U-CERT's solution

U-CERT's proposes a protocol to make **energy performance calculations more realistic**:

- Replace standard user by actual use
- Choose among different levels of detail
- From simple to extensive questionnaire
- Possibly adding sensor data



Application example: checking performance



It is obvious that the design intent and promise was not realized. WHY requires more insight ...



What's next?

- More attention is required to the real world
- EN standards on measured EP to be completed with other services and the electric energy balance
- Optimal performance is a narrow path on a sharp edge
High performance buildings need careful attention to a huge number of details all along their life span, which means
 - **Performance monitoring shall be integral part of the design**
 - **A full commissioning of building and systems is required**
 - **Somebody should be responsible for monitoring, looking at the data and reacting.**
- IOT and cloud storage may help monitoring indoor conditions and building use and setting alerts

There is **growing interest in implementing measurement based EPB assessments** as valid options for in use buildings. The concept is **very appealing, given it would allow to transition from static and often time-consuming calculated EPCs to dynamic and low-cost EPB Assessments**, which could even be leveraged for **continuous maintenance purposes**. This evolution of EPCs is often referred to as **Operational EPB Assessment**. This is of special relevance given the massive widescale rollout of electricity smart meters in the EU [25]. The gas smart meters are lagging a bit behind, and their development is not as widespread but rather focused on specific countries (i.e., France, Ireland, Italy, Luxembourg, and The Netherlands).

The results from the ethnographic research performed in U-CERT under Deliverable 2.3 were unequivocal as far as final user interest on this evolution of EPCs.

However, the implementation of **measurement based EPB assessments requires recognised methodologies, and currently there is only one CEN Standard dealing with it. It is the EN 15378-3. Energy performance of buildings. Heating and DHW systems in buildings. Part 3: Measured energy performance.**

The fact of **not having standardised methodology to rely on** when approaching whole-building measurement-based EPB Assessments is a **barrier for its widespread implementation in EPB Assessments and Certification Schemes**. Unlike energy audits, official EPB Assessments and Certification schemes should produce comparable results under standardised conditions.

Thus, the **main challenges for establishing measurement based EPB Assessments are**:

- **Service separation** (i.e. unless there are dedicated meters per each service included in the assessment, there is need to separate EPB uses from nonEPB uses and to enable use normalisation and weather standardisation)
- **Use normalisation** (i.e. measured data is implicitly influenced by actual user behaviour and building use)
- **Weather standardisation** (i.e. measured data is implicitly affected by actual climate and period, if different from full year)