European Commission

Guide to the consultation: 'Draft common EU framework of core indicators for the environmental performance of EU buildings'

Nicholas Dodd, Shane Donatello,
Miguel Gama-Caldas (JRC-IPTS)

July 2016

European Commission

Joint Research Centre

Contact information

Nicholas Dodd and Miguel Gama-Caldas

Address: Edificio Expo. c/ Inca Garcilaso, 3. E-41092 Seville (Spain)

E-mail: jrc-ipts-efficient-buildings@ec.europa.eu

Tel.: +34 954 488 728

Fax: +34 954 488 300

https://ec.europa.eu/jrc

http://ipts.jrc.ec.europa.eu

The European Commission is running a consultation on its draft proposals for a common EU framework of core indicators for the environmental performance of buildings.

The consultation will run from the 5th July until the **7th October 2016**. During this period stakeholders are invited to consult the *'summary findings and indicator proposals*' consultation document, which can be downloaded here:

http://susproc.jrc.ec.europa.eu/Efficient_Buildings/documents.html

Stakeholders are then invited to complete the on-line consultation questionnaire using the EU Survey tool, which can be accessed here:

https://ec.europa.eu/eusurvey/runner/Efficient-Building-EU-Indicators

The consultation provides stakeholders involved in the building sector with the opportunity to comment on and support the development of a common EU framework of core indicators.

This short guide is intended to provide participants in the consultation with a brief background to these proposals, the ongoing study that informs them and the role that stakeholders play in their development.

1. Background to the consultation

The European Commission's 2014 Communication on Resource Efficiency Opportunities in the Building Sector identified the need for a common EU approach to the assessment of the environmental performance of buildings. The starting point would be 'common framework of core indicators'. The framework would be rigorous enough to drive improvement in performance and allow for comparison between buildings.

A study was initiated by the European Commission in 2015 to develop an initial framework of core indicators, with the idea that they would be flexible in their use, so that they could potentially be incorporated into new and existing assessment schemes, or be used on their own by a diverse range of stakeholders, including public authorities, design teams and property investors. It is important to emphasise that the intention is not to create a new standalone building certification scheme, or to establish performance benchmarks, but rather that it should provide a voluntary reporting framework that has a broad potential for use by building sector professionals across the EU.

Recognising the importance of engaging widely with building sector professionals, a number of formal stakeholder groups have been established to support progress of the study:

- A project steering group (SG1)
- Expert sub-groups on macro-objectives (SG2) and indicators (SG3)
- A main project stakeholder group (SG4)

Further details of stakeholder engagement can be found on the project website here:

http://susproc.jrc.ec.europa.eu/Efficient_Buildings/subgroups.html

As part of the ongoing study programme, work was initiated in 2016 to identify options for the indicators themselves, with the intention that the first proposals for indicators be consulted on with the formal stakeholders groups described above, as well as more widely with stakeholders in the public and private sector.

2. The scope of buildings addressed by the framework

Following feedback received during the initial round of stakeholder consultation in 2015, it was decided to narrow the scope of the study to focus on residential and office buildings. These two building types were chosen because they represent the majority (86%) of the total floor area of the EU building stock. Of this total, residential property represents by far the majority of the total floor area of the EU building stock (75%). For each of these types of buildings, the execution of new-build and renovation projects will also be addressed.

3. The macro-objectives of the common framework

The starting point for development of the framework has been the identification of a number of 'macro-objectives'. These establish the strategic focus and scope for the framework of indicators. The working definition of a macro-objective as defined by the Commission is:

> *An environmental, resource efficiency or functional performance aspect of significance to the life cycle environmental performance of buildings at EU level.*

Six macro-objectives have been identified as the initial basis for the framework, and they will focus on performance at the building level.

Macro-objectives for the environmental performance of EU buildings

'Life cycle environmental performance' macro-objectives

1. **Greenhouse gas emissions from building life cycle energy use:** Minimise the total GHG emissions along a buildings life cycle, with a focus on building operational energy use emissions and embodied emissions.
2. **Resource efficient material life cycles:** Optimise building design, engineering and form in order to support lean and circular flows, extend long-term material utility and reduce significant environmental impacts.
3. **Efficient use of water resources:** Make efficient use of water resources, particularly in areas of identified long-term or projected water stress.

'Quality, performance and value' macro-objectives

4. **Healthy and comfortable spaces:** Design, construction and renovation of buildings that protect human health by minimising the potential for occupier and worker exposure to health risks.
5. **Resilience to climate change:** The futureproofing of building thermal performance to projected changes in the urban microclimate, in order to protect occupier health and comfort.
6. **Optimised life cycle cost and value:** Optimisation of the life cycle cost and value of buildings, inclusive of acquisition, operation, maintenance, disposal and end of life.

These six macro-objectives were the result of a process during 2015 which included a review of EU and Member State policies, Life Cycle Assessment evidence of the most significant impacts of buildings, as well as major assessment and reporting tools currently being used in the market. Proposals for the macro-objectives were also discussed with all the formal stakeholder groups established to support progress of the study. A stakeholder working group meeting held in Brussels in June 2015 was followed by a written consultation.

The findings of the work carried out during 2015 to identify the macro-objectives were published in December 2015 as Working Paper 1, which can be downloaded from the project website here:

http://susproc.jrc.ec.europa.eu/Efficient_Buildings/documents.html

4. The basis for identification of the draft indicator proposals

The consultation focusses on an initial draft set of indicators that have been identified by the European Commission. These are based on a broad initial scoping of experience in performance improvement and measurement across Europe. The scoping draws upon experience from:

- Public sector initiatives at national and regional level, including building permitting and planning requirements;
- Building practitioners: Feedback from field studies of building projects where higher environmental performance has been sought;
- Assessment and reporting schemes: The operational experience from running and using major multi-criteria certification schemes and investor reporting tools currently being used across Europe;
- Technical studies: The findings from studies that synthesise experience and expertise from the building sector in one or several member states in order to propose or refine performance measurement tools, metrics and guidance;
- Standards and harmonisation initiatives: The findings from projects to support greater harmonisation and uptake of performance measurement and reporting tools;
- Collaborative EU projects: The findings from collaborative EU projects that have brought together partners to share knowledge and experience related to performance improvement.

The findings from this scoping exercise have been brought together in two supporting documents which can be downloaded from the consultation area of the project website:

- The summary findings and indicator proposals,
- the supporting technical background report (Working Paper 2).

Both documents can be downloaded from the project website here:

http://susproc.jrc.ec.europa.eu/Efficient_Buildings/documents.html

5. Indicators as a tool to measure performance improvement

5.1 Definition of a performance indicator

It is considered important that an indicator shall be performance based and quantifiable, so as to support as far as possible performance comparisons, and that it should measure the headline performance aspects of each macro-objective. This thinking is reflected in the working definition of an indicator being used by the Commission:

> *'A specific and measurable aspect of a building's performance that can be used to support performance comparisons, benchmarking and target setting. Performance improvements measured by an indicator shall contribute to achievement, overall or in part, of the macro-objective that the indicator is associated with.'*

An indicator could be a metric for directly measuring performance of a variable, or where this is not possible, a proxy for measuring improved performance based on scientific evidence.

5.2 What makes a suitable performance indicator?

The 2014 Communication on Resource Efficiency Opportunities in the Building Sector described a number of anticipated benefits for the building sector of a core framework of EU indicators, as well as potential advantages to building sector professionals. In order to check that options for indicators support the ambition of the 2014 Communication some simple criteria have been established so that options for indicators can be screened for their suitability.

Suggested criteria for the suitability of performance indicators

- Applicable to the building scope: They should be applicable to both new-build and renovated office buildings and residential buildings.
- Meaningful measurement of performance: That it provides a meaningful measurement of a specific performance aspect of a building design or project.
- From design to actual performance: It should be possible to monitor performance as it progresses through different project stages – from design through to construction, completion, occupation and then to end of life.
- Accessible and understandable: They should be based on simple, accessible and easy to understand concepts that can be communicated to building professionals. Only basic training should be required to make use of the indicator set.
- Readily available and accepted: It should be possible to calculate/report on them using readily available, scientifically robust and accepted data, methods, tools and units of measurement/appraisal. Where possible, they should therefore use familiar and widely adopted normative references.
- Comparable: They should support, as a minimum, comparisons of functionally equivalent building designs at a project level by clients/design teams and between buildings in the immediate local property market *or* in local property portfolios.
- Easily verifiable: Verification shall be easy and cost effective in terms of documentation, data collection, project processes, test methods and the availability of accredited verification (*if required*).
- Public sector policy friendly: The indicators should potentially be useable by national, regional or local public authorities in the setting of planning and building control requirements, as well as in the procurement of public buildings.

6. The first proposals for the framework

6.1 Horizontal themes of the common indicator framework

As a consequence of identifying the first proposals for indicators, a number of 'horizontal' themes have emerged that may need to be addressed as part of how the indicators work as a whole. The horizontal themes identified so far are as follows:

1. Encouraging professional development and life cycle thinking: Relationships between indicators and differing ambition levels could be used to encourage professional development.

2. Encouraging improved measurement of intensity of resource use: Smarter indicators could be provided that experience shows provide an improved means of measuring the intensity of resource use.
3. Building upon existing standards and methodological developments: Whilst the existing standards and methods represent an important starting point, it may be necessary to set some minimum reporting 'rules' to improve comparability and encourage greater use.
4. Data availability, quality and transparency: In the case of both Life Cycle Assessment (LCA) and Life Cycle Costing (LCC) data is fundamental to the comparability and meaningfulness of the results.
5. The level at which indicators should be comparable: Variations in local conditions across the EU that range from climate to valuation techniques can affect the comparability of results.
6. The potential to track performance along a project's life cycle: The ability to track performance from design through to occupation, with a focus on both technical performance and occupant satisfaction, is becoming increasing important.

These six themes are discussed further in Chapter 2 of the 'summary findings and indicator proposals' background document, with a focus on their potential bearing on implementation of the indicator framework as a whole.

6.2 The indicators proposed for consultation

As part of the background study a wider range of potential indicators were identified and the operational experience with their use examined using a range of evidence. From the 'long list' of potential indicators identified for each of the six macro-objectives (which can be consulted in the technical background report Working Paper 2), fourteen indicators have been selected.

The fourteen indicators put forward for consultation are illustrated in Figure 1 below and, as reflected by their colour coding, comprise:

- Nine core indicators considered to require a 'basic' level of expertise (light green);
- Four core indicators considered to require an 'advanced' level of expertise (dark green); and,
- Supporting aspects of performance that, based on best practice, are recommended for each indicator as focus areas for attention (orange).

The supporting document 'summary findings and indicator proposals' provides an outline specification and calculation rules for each proposed indicators.

Based on the feedback from the consultation, the preferred set of core indicators will be identified and their associated calculation methodologies will be developed in more specific detail.

Overview of the first indicator proposals

'Life cycle environmental performance'

Macro-objective 1: Greenhouse Gas emissions from building life cycle energy use

1.1 Operational energy consumption	1.2 Life cycle Global Warming Potential
Total primary energy consumption *Indicator:* kWh/m²	**Operational and embodied GWP** *Indicator:* kg CO_2eq/m²

Macro-objective 2: Resource efficient material life cycles

2.1 Full Life Cycle Assessment	2.2 Building service life planning	2.3 Deconstruction and recyclability	2.4 Construction & demolition waste
Cradle to grave LCA *Indicator:* Impact category results	**Service life** *Indicator:* Building and components (years)	**Deconstruction and recyclability score** *Indicator:* Aggregated scope for listed building components	**a.Demolition stage** **b.Construction stage** *Indicator:* kg/100m² and % landfill diversion

Macro-objective 3: Efficient use of water resources

3.1 Operational water consumption
Total mains drinking water consumption *Indicator:* *m³/person/year*

'Quality, performance and value'

Macro-objective 4: Healthy and comfortable spaces

4.1 Indoor air quality
Pollutant emissions *Quantitative reporting:* ✓ CO_2 ✓ Total VOCs ✓ Carcinogenic VOCs ✓ R-Value ✓ Formaldehyde ✓ Benzene ✓ Particulates (PM 2.5/10) *Qualitative reporting:* ✓ Presence of mould

Macro-objective 5: Resilience to climate change

Proxy indicator *(if 5.2 not feasible)*

5.1 Thermal comfort	5.2a Additional cooling	5.2b Microclimate cooling
Overheating risk assessment *Indicator:* (Adaptive) degree hours	**Additional cooling primary energy consumption** *Indicator:* kWh/m².yr	**Green factor** *Indicator:* Sum weighted cooling effect for green features on/around buildings

Macro-objective 6: Optimised life cycle cost and value

6.1 Life Cycle Costing		6.2 Creating value and managing risk
a. Utility costs *Indicator:* €/yr/m² (30/50 yrs)	**b. Acquisition and maintenance costs** *Indicator:* €/yr/m² (30/50 yrs)	**Value/risk factors** *Indicator:* *Reliability rating of indicator input data*

Key to the colour coding: **'Advanced' core indicators** **'Basic' core indicators**