Towards a common EU framework of core indicators for the environmental performance of buildings

Fields marked with * are mandatory.

Introduction

The European Commission is interested in the opinion of built environment professionals and stakeholders on the first proposal for a framework of core EU indicators for the environmental performance of buildings.

If you have an active and professional interest in the development and use of such a framework of 'basic' EU indicators, and what they could mean for the sector, we invite you to read the short ***'Guide to the consultation'*** and then to complete this questionnaire, which forms part of a wider ongoing consultation process.

Answering the mandatory questions should take approximately **30-40 minutes** to complete. Once you have started completing the questionnaire you can save your responses and return to them at any time before formally submitting them. If you do choose to save your draft response before submitting, *please make sure that you copy the **unique url** that you will be provided with after saving your draft response or ask the program to send this to your email address.* This url will be your unique link to your draft response.

The questionnaire asks for your feedback on the following aspects:

- Brief details of your own background or the organisation you represent (mandatory*).
- How the framework of indicators could work (mandatory*).
- General opinions about the proposed indicators (mandatory*).
- Specific questions about the proposed indicators (optional).
- Open questions (optional).

For technical background about the proposed indicators we also strongly recommend reading beforehand the more detailed document entitled ***'Summary findings and proposals for indicators'***.

Yours or your organisation's response will help us to refine the initial proposals and ensure that they build upon existing work, reflect a consensus on how to achieve improvement and maximise their potential for use across the EU.

All responses to this questionnaire will be analysed following closure of the open consultation on **7 October 2016**. They will then be summarised anonymously in a consultation report which will be published, together with revised proposals for the indicators, prior to further discussion at a working group meeting of the project stakeholder group on **30 November 2016**.

If you have any queries relating to the project or completion of this questionnaire please email: JRC-IPTS-EFFICIENT-BUILDINGS@ec.europa.eu

Part 1: Background on respondent (names, emails and organisation names shall be treated as confidential)

In this first part, we are interested in your professional background, the extent of your experience in the sector and the nature of your interest in the indicators. This will help us to better understand the different viewpoints of stakeholders on the indicators.

For responses submitted on behalf of organisations or associations, it is only necessary to answer questions 1.1, 1.2 and 1.3 from this section.

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Q1.1. What is your name?

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Q1.2. Please provide a contact email address.

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Q1.3. What organisation do you work for or represent?

Q1.4 What best describes your current role or professional background in the building sector? *(please select from the following options)*

- Public sector policy and regulation
- Public sector building procurement and management
- Private property investor or developer
- Property market valuation
- Property market advice and management
- Building design and engineering
- Specialist environmental consulting and assessment
- Building construction and contracting
- Building demolition and recycling
- Operator of building assessment and reporting scheme
- Construction product manufacturing
- Social housing management
- Public research/teaching
- Private research
- Other (please specify)

If you selected "other" form the list above, please specify here:

Q1.5 How many years have you worked in the building sector?

- < 5
- 5 - 15
- > 15

Q1.6 Which of the following building types have you worked with?

- Office new-build
- Office renovation
- Residential new-build
- Residential renovation
- Other non-residential

Q1.7 During the last five years, have you in your professional life:

- Carried out a specialised analysis of a buildings environmental performance (e.g. an energy, embodied CO2 eq or Life Cycle Assessment)?
- Been involved in the auditing of a building using an assessment scheme or reporting tool (like LEED, BREEAM, HQE, DGNB, GRESB or others)?
- Been part of a design team for a building project in which environmental performance objectives were set?
- Been a client for a building project in which environmental performance objectives were set?
- Been a contractor for a building project in which environmental performance objectives were set?
- Been involved in the management of a portfolio of property assets for which environmental performance objectives were set.
- Carried out or been involved with a research project to analyse a specific environmental performance aspect of buildings.
- Been involved in other activity related to the environmental performance of buildings (please specify)

If you selected "...other activity..." from the list above, please describe it briefly here:

Part 2: How the framework of indicators could work

In this part, we are interested in how the framework of indicators as a whole could work.

The framework of indicators could work as one set of 'basic' indicators, with a recommendation to report on all of them, thereby supporting broad comparison of different building projects.

On the other hand, another possibility would be that it consists of a more limited number of 'basic' indicators, complemented by additional more challenging and complex 'advanced' indicators for use by more experienced design teams, contractors and clients.

2.1. The structure of the indicator framework

Q2.1 Please tick the boxes which best reflect your opinion about the following different indicator frameworks:

	Strongly disagree	Disagree	Neutral opinion	Agree	Strongly agree
*A set of basic indicators should be used, each with a similar 'basic' ambition level	○	○	○	○	○
*A set of basic indicators should be used, complemented by optional additional indicators, all at a similar 'basic' ambition level	○	○	○	○	○
*A set of basic indicators should be used, complemented by optional additional more challenging 'advanced' indicators	○	○	○	○	○
*A combined set of 'basic' and 'advanced' indicators should be used, complemented by optional additional indicators, for different levels of ambition	○	○	○	○	○

(Optional) If you have any other preferences for how the indicator framework should be set up, please state it breifly here:

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Q2.2 How many indicators do you think there should be in total?

- 6 or less
- 9 or less
- 12 or less
- 15 or less
- As many as required
- Don't know / no opinion

2.2. Themes emerging from the background study

The following questions relate to the six themes to have emerged from the background scoping study.

Before answering them we strongly recommend consulting Chapter 2 of the background document ***'Summary findings and indicator proposals'***, which describes the themes in more detail.

Theme 1: Encouraging professional development and life cycle thinking

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Q2.3 To what extent should the indicators require differing levels of expertise? *(please choose the option which most closely reflects your opinion)*

- Only a basic level of expertise should be required for all indicators under each macro-objective.
- Potentially only some indicators under each macro-objective could require a greater level of expertise, so as to encourage market leaders.
- All macro-objectives should have a combination of indicators requiring a basic and a greater level of expertise.

Theme 2: Indicators to measure intensity of resource use

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Q2.4 Would there be value in offering additional, more targeted indicators to measure intensity of resource use (e.g. on a per occupant basis instead of per m2)? *(please choose the option which most closely reflects your opinion)*

- Reporting should only be on 'basic' indicator metrics.
- Reporting should be possible using additional, more targeted indicator metrics.
- The use of additional, more targeted indicator metrics should only be recommended for internal use.

Theme 3: Existing standards and methodologies

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Q2.5 To what extent could narrower *life cycle stage boundaries* (e.g. production, construction, use, End of Life etc.) be defined in order to encourage greater reporting on life cycle Global Warming Potential (GWP), Life Cycle Assessment (LCA) and Life Cycle Costing (LCC)? *(please choose the option which most closely reflects your opinion)*

- The life cycle stage boundaries set out in standards should not be narrowed.
- Life cycle stage boundaries may be narrowed only where significant trade-offs do not occur.
- Life cycle stage boundaries may be narrowed only when stages omitted are of low environmental significance overall.

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Q2.6 To what extent could a narrower *building component scope* (e.g. structure, facade, fit out materials) be defined in order to encourage greater reporting on life cycle Global Warming Potential (GWP), Life Cycle Assessment (LCA) and Life Cycle Costing (LCC)? *(please choose the option which most closely reflects your opinion)*

- The building component scope set out in standards should not be narrowed.
- The building component scope may be narrowed to focus on significant hot spots along the life cycle.
- The building component scope may be narrowed to reflect data quality and availability.

Theme 4: Data availability, quality and transparency

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Q2.7 What should be the approach given that data may be limited in quality/availability in some member states? *(please choose the option(s) which most closely reflects your opinion)*

- [ ] Users shall report on data sources and quality in order to be transparent.
- [ ] The framework should include a rule that excluded the use of certain low quality data sources.
- [ ] Users should not report on this indicator if they have serious doubts about the quality of the data.
- [ ] The framework should not include indicators if this is widespread problem at European level

Theme 5: Comparability

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Q2.8 At what level do you think it is most appropriate that the indicators support performance comparisons? *(please choose the option(s) which most closely reflects your opinion)*

- ☐ Across the whole of Europe
- ☐ At national level.
- ☐ At regional level.
- ☐ At local level.
- ☐ At project level.

Theme 6: Tracking performance along a projects life cycle

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Q2.9 To what extent should the indicators allow for the tracking of quantifiable aspects of building performance from design through to post-occupation? *(please choose the option(s) which most closely reflects your opinion)*

- ☐ Performance at design stage only.
- ☐ Performance at both design and post-occupation stages.
- ☐ Performance at both design and post-occupation stages with the potential for occupant surveys.

Part 3: Questions relating to the initally proposed indicators

In this part, we are interested in your opinion on the first proposals for indicators, as briefly presented in the ***'Guide to the consultation'***.

The questions relate to the indicators proposed under each of the EU 'macro-objectives' for building quality and environmental performance.

For each proposed indicator, there are two types of questions. The first type ask for your overall opinion on suitability and are mandatory. The second type are more detailed questions and are optional. To answer these more detailed questions we strongly recommend having read the technical document ***'Summary findings and indicator proposals'***, where the background the the questions is discussed.

3.1. General questions about all proposed indicators across all 6 macro-objectives

Q3.1 Please tick the options which best reflect your opinions about the suitability of each indicator to measure performance:

	Unsuitable	Neutral opinion	Partly suitable	Suitable as proposed
*Indicator 1.1. Total primary energy consumption (kWh/m2/yr)	○	○	○	○
*Indicator 1.2. Operational and embodied Global Warming Potential (kg CO2 eq/m2/yr)	○	○	○	○
*Indicator 2.1. Cradle to grave Life Cycle Assessment (LCA) (Impact category results normalised to m2)	○	○	○	○
*Indicator 2.2. Service life reporting(design service life for building and specified elements/components)	○	○	○	○
*Indicator 2.3. Ease and scope for disassembly and recycling (Sum of category scores)	○	○	○	○
*Indicator 2.4. Construction and Demolition waste arisings (i. tonnes/100 m2 floor area; ii. % diversion from landfill to recycling and re-use excluding backfilling)	○	○	○	○
*Indicator 3.1. Total mains drinking water consumption (m3 per person per year)	○	○	○	○

*Indicator 4.1. Quantitative reporting on specific pollutant levels: CO2, total VOC, Carcinogenic VOCs, R-Value, formaldehyde, benzene and particulates (PM 2,5/10,0)				
*Indicator 4.1. Qualitative reporting on the presence of mould				
*Indicator 5.1. Overheating risk assessment (adaptive degree hours)				
*Indicator 5.2a. Additional cooling primary energy consumption (kWh/m2)				
*Indicator 5.2b. Green factor (sum of weighted cooling effect for green features on/around the building)				
*Indicator 6.1a. Long term utility costs (€/m2.yr over 30 or 50 years)				
*Indicator 6.1b. Long term acquisition and maintenance costs (€/m2.yr over 30 or 50 years)				
Indicator 6.2. Value and risk factors (Reliability rating for the input data and assumptions for each indicator)				

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Q3.2 Please enter a value of 1-5 (1 = strongly disagree, 2 = disagree, 3 = neutral opinion, 4 = agree and 5 = strongly agree) which best reflect your opinions about the following statements for each indicator:

(note that only values of "1", "2", "3", "4" or "5" should be entered. Any other inputs shall be ignored when analysing feedback).

	...is simple, accessible an
Indicator 1.1. Total primary energy consumption (kWh/m2/yr)...	
Indicator 1.2. Operational and embodied Global Warming Potential (kg CO2 eq/m2/yr)...	
Indicator 2.1. Cradle to grave LCA (Impact category results normalised to m2)...	
Indicator 2.2. Service life reporting (design service life of the building and specified elements/components)...	
Indicator 2.3. Ease and scope for disassembly and recycling (Sum of category scores)...	
Indicator 2.4. Waste arisings a. Demolition; b. Construction (i. t/100 m2 floor area; ii. % diversion to recycling and re-use excluding backfilling)...	
Indicator 3.1. Total mains drinking water consumption (during use stage) (total mains water consumption m3 per person per year)...	
Indicator 4.1. Quantitative reporting on specific pollutant levels: CO2, total VOC, Carcinogenic VOCs, R-Value, formaldehyde, benzene and particulates (PM 2,5/10,0)...	
Indicator 4.1. Qualitative reporting onthe presence of mould...	
Indicator 5.1. Overheating risk assessment (adaptive degree hours)...	
Indicator 5.2a. Additional cooling primary energy consumption (kWh/m2)...	
Indicator 5.2b. Green factor (Sum of weighted cooling effect for green features on/around the building)...	
Indicator 6.1a. Long term utility costs (€/yr normalised per m2 over 30 or 50 years)...	
Indicator 6.1b. Long-term acquisition and maintenance costs (€/yr normalised per m2 over 30 or 50 years)...	

Indicator 6.2. Value and risk factors (Reliability rating for the input data and assumptions for each indicator)...				

3.2. Specific questions about all proposed indicators across all 6 macro-objectives

The following questions focus on more technical aspects of the indicator proposals. They assume that you have read the background document '***summary findings and indicator proposals***':

3.2.1. Specific questions for proposed indicators that relate to **macro-objective 1** (Greenho use gas emissions from building life cycle energy use):

Q3.3 For office buildings, which aspects of indicator 1.1 (total primary energy consumption: kWh/m2/yr) should be aligned with the proposed EU Voluntary Certificate Scheme? (see Section 3.1 in the 'summary findings and indicator proposals' document for more details) *(please select from the following answers)*

- ☐ Harmonisation with the headline indicator.
- ☐ Use of hourly dynamic energy simulation.
- ☐ Reporting of both calculated and measured performance.
- ☐ Disclosure of input assumptions.
- ☐ Option to also report on CO2 emissions.
- ☐ Additional aspects (please specify below).

(Optional) Please specify any additional aspects here

Q3.4 Does indicator 1.1 (total primary energy consumption) provide a strong enough incentive to design more resource efficient buildings?
Please choose the option(s) which most closely reflect your opinion.

- ☐ It provides sufficient incentive.
- ☐ It should have a stronger focus on delivered (final) electricity/fuel use *e.g. heating and cooling demand.*
- ☐ It should have a stronger focus on how much renewable energy is used or generated.

3.2.2. Specific questions for proposed indicators that relate to **macro-objective 2** (Resource efficient material life cycles):

Q3.5 What form should reporting on a full LCA (indicator 2.1 Cradle to grave LCA) take? *(please choose the option which most closely reflect your opinion)*

- ○ Confirmation that a full LCA has been carried out according to EN 15978.
- ○ Provision of results for the impact categories listed in EN 15978.
- ○ Provision of results for the impact categories listed in EN 15978, together with results for some additional impact categories.

Q3.6 Opinions about certain aspects of indicators 2.1 to 2.4. Please tick the options which best reflect your opinion about the following statements:

	Strongly disagree	Disagree	Neutral opinion	Agree	Strongly agree

A '*design for adaptability'* indicator does not need to be developed, because it is already considered within indicators 1.2 (Operational and embodied GWP) and 2.1 (Cradle to grave LCA)	○	○	○	○	○
Indicator 2.2 (Service life reporting) has added value being reported as a separate indicator	○	○	○	○	○
Indicator 2.3 (Ease and scope for disassembly and recycling) will encourage design teams and contractors to focus on this issue at design and construction stage	○	○	○	○	○
The in-situ reuse of large building elements such as structures in new or remodelled buildings should be specifically encouraged by a dedicated indicator	○	○	○	○	○
A *'recycled content'* indicator for building materials **does not** need to be developed because it is already addressed within indicators 1.2 (Operational and embodied GWP) and 2.1 (Cradle to grave *LCA*)	○	○	○	○	○

Indicators 1.2 (Operational and embodied GWP) and 2.3 (Ease and scope for disassembly and recycling) should be linked to allow for any potential net CO2 benefits from the reuse and recycling of materials at the end of life of a building (EN 15978, Module D) to be consistently accounted for	○	○	○	○	○

3.2.3. Specific questions for proposed indicators that relate to **macro-objective 3** (Efficient use of water resources):

Q3.7 Is the proposed indicator 3.1 (Total mains drinking water consumption (during use stage)) sufficient to measure intensity of water use?

Please choose the option(s) which most closely reflect your opinion:

- ☐ It is sufficient to measure intensity of use.
- ☐ It should be normalised to the predicted building occupation.
- ☐ It should be normalised to the building floor area.

Q3.8 What type of data do you consider appropriate to use for the water consumption of sanitary fittings?

Please choose the option(s) which most closely reflect your opinion:

- ☐ Independently verified, generic performance data.
- ☐ Self-declarations by manufacturers.
- ☐ Third party verification of manufacturers claims.
- ☐ Third party verified water labelling scheme.
- ☐ Other.

(Optional) Please specify any other acceptable data sources here

Q3.9 Considering average residential water consumption with indicator 3.1 (Total mains drinking water consumption (during use stage)). *Please tick the option which best reflects your opinion:*

	Stongly disagree	Disagree	Neutral opinion	Agree	Strongly agree
Calculated residential water use should be adjusted to reflect average consumption in that part of the EU e.g. Southern Europe	○	○	○	○	○

3.2.4. Specific questions for proposed indicators that relate to **macro-objective 4** (Healthy and comfortable spaces):

Q3.10 The appropriateness of the pollutants covered in indicator 4.1 (Reporting on specific pollutant levels or pollutant presence). Please tick the options which best reflect your opinions about the following statements:

	Strongly disagree	Disagree	Neutral opinion	Agree	Strongly agree
CO2 should be included	○	○	○	○	○
TVOC should be included	○	○	○	○	○
Formaldehyde should be included	○	○	○	○	○
R-value should be included	○	○	○	○	○
Carcinogenic VOCs should be included	○	○	○	○	○
Benzene should be included	○	○	○	○	○
Particulates (PM 2.5 / 10) should be included	○	○	○	○	○
Presence of mould should be included	○	○	○	○	○

(Optional) Please specify any other pollutants that should be considered

Q3.11 How should the scope of building products, for which emissions testing results should be obtained, be defined?

Please choose the option(s) which most closely reflect your opinion:

- ☐ Based on a complete list of construction, renovation and fit out products.
- ☐ Based only on those construction, renovation and fit out products with the potential for emissions.
- ☐ Based only on those products that have the greatest potential to contribute to emissions.

3.2.5. Specific questions for proposed indicators that relate to **macro-objective 5** (Resilience to climate change):

Q3.12 Opinions about certain aspects of indicators 5.1, 5.2a and 5.2b. *Please tick the options which best reflect your opinions about the following statements:*

	Strongly disagree	Disagree	Neutral opinion	Agree	Strongly agree
Both *Overheating risk assessment* (indicator 5.1) and *Additional cooling primary energy consumption* (indicator 5.2a) should be reported	○	○	○	○	○
The two main indicators 5.2a (*Additional cooling primary energy consumption*) and 5.1 (*Overheating risk assessment*) should be covered in indicators 1.1 (*Total primary energy consumption*) and 4.1 (*Reporting on specific pollutant levels or pollutant presence*) respectively, negating the need for any macro-objective 5 section	○	○	○	○	○
A proxy measure for the *microclimate cooling effect* (indicator 5.2b Green factor) would be a useful alternative to a building thermal simulation	○	○	○	○	○

3.2.6. Specific questions for proposed indicators that relate to **macro-objective 6** (Optimise d life cycle cost and value):

Q3.13 Further opinions about indicators 6.1a, 6.1b and 6.2. *Please tick the options which best reflect your opinions about the following statements:*

	Strongly disagree	Disagree	Neutral opinion	Agree	Strongly agree
The "cost optimal" EU methodology (as described in Delegated Regulaton (EU) No 244/2012) should be used as a simplified methodology for indicator 6.1a (*Long term utility costs*)	○	○	○	○	○
The Life Cycle Costing (LCC) focus on operational costs and long term acquisition and maintenance costs for indicator 6.1b (*Long-term acquisition and maintenance costs*) is appropriate	○	○	○	○	○
A simple reliability rating based on a scoring of the input data and assumptions for each of the other indicators (e.g. *1.1 Total primary energy consumption*) would be useful for valuers	○	○	○	○	○

Q3.14 What do you think are the most appropriate life spans for maintenance plans for the following building types? *Please tick the options which best reflect your opinions about the following statements:*

	<10 years	10-15 years	15-20 years	20-30 years	30-50 years	50-100 years	>100 years
Individual houses	○	○	○	○	○	○	○
Apartment blocks	○	○	○	○	○	○	○
Office buildings	○	○	○	○	○	○	○

Part 4: Open questions

In this final part of the questionnaire we give you, or the organisation you represent, the opportunity to submit open comments on any aspect of how the indicators could work and also the specific indicator proposals.

Q4.1 How should the framework of indicators work and to which actors (e.g. public authority planners, design teams, construction contractors, property investors etc.) would it be most relevant?

Q4.2 Any additional views on the specific indicator proposals