Technical annexes

Annex A

Supporting guidance for criterion* B14 *(core criterion): Option 1 – Carbon footprint (CF)

The award criterion B14 (core criterion) states that Carbon Footprint (CF) could be used by bidders in order to demonstrate how they have reduced the environmental impact of a road construction. This brief guidance note describes:

- When this criteria can be used;
- The rules required to ensure that bids are comparable; and
- The technical support required for bid selection.

All use of CF shall be carried out with reference to ISO 14067 or equivalent.

1.1 When can CF option 1 be used?

The use of criteria B14 is only recommended where a comparison can be made of improvement options against a reference road design and/or between different road designs. It is therefore relevant to the following procurement scenarios:

- Where the client already has a reference road design and bill of quantities that has been appraised in order to provide a guide price for comparison with bids;
- Where a design competition is to be used to encourage proposals of innovative road designs by design teams and/or contractors.

In these scenarios a CF analysis can be made an award requirement.

1.2 Will additional expertise be required to evaluate bids?

In any tender process for road construction and maintenance the procurer is likely to require supporting design and technical expertise in order to set requirements and evaluate designs. The procurer may therefore wish to call upon this expertise at two stages in the procurement process:

1. When putting together the design brief and performance requirements: Bidders shall be instructed on what technical requirements they should follow in order to ensure that the designs submitted are comparable.
2. When evaluating designs and improvement options: A technical evaluation of tenderers' responses to this criterion should be carried out in order to support the procurer.

A technical evaluator shall be required to carry out a critical review of each tenderer's CF analysis according to the guidance in Annex C.

1.3 What instructions should be given to bidders?

The following technical instructions should be incorporated into the ITT in order to ensure that bids are comparable. Where designs are to be evaluated against a reference road, this shall be clearly stated and the bill of materials provided.

Technical instructions for bidders using CF for road evaluations

Technical point to address	**What this means in practice**
a. Method and inventory data	The impact assessment method and life cycle inventory (LCI) data to be used by each design team shall, as far as possible, be specified to ensure comparability. Verified primary data may be used to supplement gaps following the guidance in ISO 14067 or equivalent, and for data from EPDs, ISO 14025 and EN 15804. ISO 21930 could also be used as underlying standards, if relevant. The level of uncertainty shall be addressed by including: 1. a qualitative assessment of the uncertainties based on the sources of background data, how it was obtained or compiled and what kind of process and technology it represents; as well as 2. a quantitative assessment for the two most significant road elements identified from the analysis (see point d. and Tables a and b in criterion B14).
b. Comparison on the basis of functional equivalence	The following characteristics of the road shall be specified as a reference point for each design (see ISO 14067 or equivalent): - Relevant technical and function requirements, as described in the performance requirements; - The requested service life.

	A common functional unit shall be used to present the results (see ISO 14067 or equivalent).
c. Definition of the road life cycle and boundaries	The boundary for the analysis shall be cradle-to-grave including construction (including materials production and transportation) maintenance and operation and EoL. Allocation for recycled or re-used materials shall be made according to the following rules: – Input (product stage): according to the rules in ISO 14067 or equivalent; – Output (end of life or maintenance stages): according to the rules in EN 15804 section 6.4.3.
d. Road elements within the scope of the criteria	The scope of the criteria shall, as a minimum, comprise the following road elements: - Sub-grade, including earthworks and ground works; - Sub-base; - Base, binder and surface or concrete slabs; - Additional ancillary road elements (optional)
e. Lifecycle category indicator to be used for evaluation purposes	Global warming potential (GWP)

Annex B

Supporting guidance for criterion* B14 *(comprehensive criterion): Option 2 - LCA analysis

The award criterion B14 states how Life Cycle Assessment (LCA) could be used by bidders in order to demonstrate how they have reduced the environmental impact of the construction of a road. This brief guidance note describes:

- When this criterion can be used;
- The rules required to ensure that bids are comparable; and
- The technical support required for bid selection.

All use of LCA shall be carried out with reference to ISO 14040/14044.

2.1 When can LCA option 2 be used?

The use of criteria B14 is only recommended where a comparison can be made of improvement options against a reference road design and/or between different road designs. It is therefore relevant to the following procurement scenarios:

- Where the client already has a reference road design and bill of quantities that has been appraised in order to provide a guide price for comparison with bids;
- Where a design competition is to be used to encourage innovative road designs to be brought forward by design teams and/or contractors.

In these scenarios an LCA analysis can be used as an award criterion.

2.2 Will additional expertise be required to evaluate bids?

In any tender process for road construction and maintenance the procurer is likely to require supporting design and technical expertise in order to set requirements and evaluate designs. The procurer may therefore wish to call upon this expertise at two stages in the procurement process:

1. When putting together the design brief and performance requirements: Bidders shall be instructed on what technical requirements they should follow in order to ensure that the designs submitted are comparable.
2. When evaluating designs and improvement options: A technical evaluation of tenderers' responses to this criterion should be carried out in order to support the procurer.

A technical evaluator shall be required to carry out a critical review of each tenderers LCA analysis according to the guidance in Annex C.

2.3 What instructions should be given to bidders?

The following technical instructions should be incorporated into the ITT in order to ensure that bids are comparable. Where designs are to be evaluated against a reference road, this shall be clearly stated and the bill of materials provided.

Technical instructions for bidders using LCA for road evaluations

Technical point to address	What this means in practice
a. Method and inventory data	The impact assessment method and life cycle inventory (LCI) data to be used by each design team shall, as far as possible, be specified to ensure comparability. Verified primary data may be used to supplement gaps following the guidance in ISO 14040/14044, and for data from EPDs, ISO 14025 and EN 15804. ISO 21930 could also be used as underlying standards, if relevant. The level of uncertainty shall be addressed by including: 1. a qualitative assessment of the uncertainties based on the sources of background data, how it was obtained or compiled and what kind of process and technology it represents; as well as 2. a quantitative assessment for the two most significant road elements identified from the analysis (see point d. and Tables a and b in criterion B14).
b. Comparison on the basis of functional equivalence	The following characteristics of the road shall be specified as a reference point for each design (see ISO 14040/14044): – Relevant technical and function requirements, as described in the performance requirements; – The requested service life. A common functional unit or reference unit shall be used to present the results (see ISO 14040). Service lifetime shall be considered in the definition of the functional unit.
c. Definition of the road life cycle and boundaries	The boundary for the analysis shall be cradle-to-grave including construction (including materials production and transportation) maintenance and operation and EoL (see ISO 14040). Allocation for recycled or re-used materials shall be made according to the following rules: – Inputs (product stage): according to the rules in ISO 14044, Section 4.3.4.3; – Outputs (end of life or maintenance stages): according to the rules in EN 15804 section 6.4.3.
d. Road elements within the scope of the criteria	The scope of the criteria shall, as a minimum, comprise the following road elements: – Sub-grade, including earthworks and ground works; – Sub-base; – Base, binder and surface or concrete slabs; – Additional ancillary road elements (optional). When applied, energy harvesting technologies shall be included in the LCA as ancillary road elements and electricity generated during the operation phase shall be discounted from the energy consumed during this phase.
e. Lifecycle category indicators to be used for evaluation purposes	As a minimum the following impact category indicators, identified in EN 15804, shall be used: – Global Warming Potential (GWP); – Formation potential of tropospheric ozone photochemical oxidants (POCP); – Depletion potential of the stratospheric ozone layer (ODP); – Acidification potential of soil and water (AP); – Eutrophication potential (EP); – Abiotic Resource Depletion Potential for elements (ADP_elements); – Abiotic Resource Depletion Potential of fossil fuels (ADP_fossil fuels). Other indicators describing resource use, waste and output flows identified by EN 15804 can also be, partially or fully, included if they are not already covered by other GPP criteria, *e.g.*, a recycled content. A weighting system for the selected impact category indicators shall be applied in order to evaluate the overall score. This system shall be selected by the contracting authority on the basis of: – a suitable existing weighting system, such as the weighting systems adopted in some national LCA schemes; *or* – a weighting system proposed by the LCA technical evaluator (see Annex C). Where an LCA tool generates an aggregated scoring for the road, only the result for the impact categories identified in EN 15804 shall be taken into account.

Annex C

Brief for LCA technical evaluator

The role of the technical evaluator will be to assist the procurer in setting the ground rules for the tenderers, with reference to either Annex A or B, depending on the option chosen.

The technical evaluator shall propose and agree with the contracting authority the weighting of the LCIA indicator results, which shall be indicated in the ITT.

Once tenders have been opened, the technical evaluator will either:

(i) Carry out a critical review of the CFs for methodological choices, data quality and comparability; or

(ii) Carry out a critical review of the LCAs for methodological choices, data quality and comparability.

The critical review will be carried out with reference to ISO 14044, section 6, ISO 14065 in case of carbon footprint, and the following sections of the European Commission's Product Environmental Footprint (PEF) Recommendation (2013/179/EU):

- Critical review (section 9, p-68);
- Data collection checklist (Annex III);
- Data quality requirements (section 5.6, p-36);
- Interpretation of results (section 7, p-61).