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COMMISSION STAFF WORKING DOCUMENT

EU GPP Criteria for Office Building Design, Construction and Management

EU GPP Criteria for Office Building Design, Construction and Management

1 INTRODUCTION

EU GPP criteria aim at facilitating public authorities the purchase of products, services and works with reduced environmental impacts. The use of the criteria is voluntary. The criteria are formulated in such a way that they can be, if deemed appropriate by the individual authority, integrated into its tender documents'. This document provides the EU GPP criteria developed for the product group "office buildings". It is supported by a Guidance document that provides orientation on how to effectively integrate this GPP criteria set into the procurement process. An accompanying Technical Background Report provides further details on the reasons for selecting these criteria and references for further information.

The criteria are divided into Selection Criteria, Technical Specifications, Award Criteria and Contract Performance Clauses. For each set of criteria there is a choice between two ambition levels:

- *The Core criteria are designed to allow for easy application of GPP, focussing on the key area(s) of environmental performance of a product and aimed at keeping administrative costs for companies to a minimum.*
- *The Comprehensive criteria take into account more aspects or higher levels of environmental performance, for use by authorities that want to go further in supporting environmental and innovation goals.*

It should be borne in mind that the procurement of office buildings is a particularly complex issue which necessarily results in the fact that, for both core and comprehensive levels of ambition, the inclusion of green criteria does require - when compared to standard solutions - increased expertise, verification effort and, at least for some of the criteria and depending on the procurement route and the experience of the design team and contractors, higher upfront costs.

Whilst GPP is a voluntary instrument, it is important to highlight that other pieces of EU legislation exist which regulate the environmental performance of office buildings with binding obligations. For example, Article 6 of the Energy Efficiency Directive 2012/27/EU¹ states that Member States shall ensure that central governments only

¹ Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC, (OJ L 315, 14.11.2012, p. 1)

purchase products, services and buildings with a high energy-efficiency performance insofar that it is consistent with cost-effectiveness, economical feasibility, wider sustainability, technical suitability and sufficient competition.

1.1 Definition and Scope

This GPP criteria set addresses the procurement process for office buildings, including their design, site preparation, construction, servicing and ongoing management. For the purposes of the criteria, the product group "Office buildings" shall comprise buildings where mainly administrative, bureaucratic and clerical activities are carried out. An office building is, moreover, defined as being:

"A building whose primary function is to provide space for administrative, financial, professional or customer services. The office area must make up a significant majority of the total building's gross area. The building may also comprise other type of spaces, like meeting rooms, training classrooms, staff facilities, or technical rooms".

Buildings constituting offices will fall under the specific planning use classes within Member States. The definition of "significant" can vary by Member State, but is generally within a range of 50-80% of the building. The GPP criteria do not cover parking areas that are located outside of the building's physical footprint or curtilage. Major renovations of office buildings are also addressed within the scope of the criteria. Such renovations are defined by the Energy Performance of Buildings Directive 2010/31/EU as instances where:

- a) the total cost of the renovation relating to the building envelope or the technical building systems is higher than 25 % of the value of the building, excluding the value of the land upon which the building is situated; or*
- (b) more than 25 % of the surface of the building envelope undergoes renovation.*

This criteria set contains recommendations that apply to both the renovation of existing buildings and the construction of new buildings. The criteria are supported by guidance on the process of developing and procuring a new or renovated office building. The key stages in this process that are identified in the guidance are as follows:

- Preliminary scoping and feasibility;
- Detailed design and applications for permits;
- Strip-out, demolition and site preparation works;
- Construction of the building or major renovation works;
- Installation of energy systems and the supply of energy services;
- Completion and handover;
- Facilities management;
- Post Occupancy Assessment.

The specific stages in this process during which formal procurement takes place, and for which criteria are provided in this document, are identified in Section 1.2.

Energy services are defined according to Directive 2012/27/EU² as:

'The physical benefit, utility or good derived from a combination of energy with energy efficient technology and/or with action, which may include the operations, maintenance and control necessary to deliver the service, which is delivered on the basis of a contract and in normal circumstances has proven to lead to verifiable and measurable or estimable energy efficiency improvement and/or primary energy savings.'

For the purpose of the GPP criteria for office buildings, the procurement of energy services is primarily focussing on the provision of the supply of low or zero carbon emission energy to an office building by energy service providers such as energy service companies (ESCOs) or, as defined by Directive 2012/27/EU, energy performance contracting.

Facilities management is defined according to EN 15221³ as:

'[the] integration of processes within an organisation to maintain and develop the agreed services which support and improve the effectiveness of its primary activities'

For the purpose of these criteria 'primary activities' refer to operation of the office building with main area of relevance within EN 15221 being 'Space & Infrastructure' which encompasses the activities relating to the management of accommodation, workplaces, technical infrastructure and ICT systems.

For each of these activities, environmental criteria are proposed. The criteria address the most significant environmental impacts related to office buildings which are related to greenhouse gas emissions from energy consumption during the use of the building and resource use to manufacture construction materials. These are in turn influenced by the management, lifespan and fitness for use of the building. Other factors that influence the lifespan and use of the building, such as the creation of a healthy internal environment, are therefore also addressed.

In general, the criteria focus on an office building as a system rather than individual components. It should be noted that separate GPP criteria are available that can be used for the procurement of various building components. At the time of writing, components of relevance for which there exist EU GPP criteria⁴ include:

- Wall panels,
- Combined Heat and Power (CHP) systems,
- Water-based heating systems,
- Indoor lighting,
- Taps and showerheads,
- Toilets and urinals.

While these criteria have been specifically developed for office buildings, many of the requirements could also be used as a reference for the procurement of other types of building.

² ibid 1

³ EN 15221 series, *Facility management*, October 2006 version

⁴ See European Commission, *Green Public Procurement*, DG Environment, http://ec.europa.eu/environment/gpp/eu_gpp_criteria_en.htm

1.2 Applicability of the Green Public Procurement criteria for Office Building Design, Construction and Maintenance

Designing and procuring an office building with a reduced environmental impact, whether it be new-build or a major renovation, is a complex process. As is highlighted by the SCI (Sustainable Construction and Innovation through Procurement) Network in their guide for European Public Authorities⁵, the form of procurement and the way in which GPP criteria are integrated into the procurement process can have a significant influence on the outcome.

The process of constructing a new office building or carrying out a major office renovation consists of a distinct sequence of procurement activities with related contracts. This sequence of procurement can have a significant influence on the outcome. This is because each type of contract brings with it distinct interactions between the procurer, the building design team, the contractors and the future occupants and facilities managers. Moreover, they each have advantages and disadvantages in seeking to procure a building with an improved environmental performance.

Depending on the procurement route adopted, some of these contracts may be awarded to the same contractor but in most cases they are let separately. Some contracts may be integrated in a design and build (DB) or a design, build and operate (DBO) arrangement, with the detailed design process, the main construction contract, the installation or provision of energy services and even facilities management all potentially co-ordinated by one contractor.

It is therefore important to identify the main points in the sequence of procurement activities where GPP criteria should be integrated. To this end these criteria are arranged to reflect the most common procurement activities and are accompanied by a guidance document which provides general advice on how and when GPP criteria can be integrated into this process. It also suggests, based on experience from projects across the EU, how the procurement sequence could be managed in order to achieve the best results, issues to consider at key stages along the process and specific types of expertise that may help to obtain better outcomes.

The following stages in the procurement process for a new or renovated office buildings are covered by the proposed criteria. They have been identified as stages where formal procurement will take place or requires monitoring:

- A. Selection of the design team and contractors
- B. Detailed design and performance requirements
- C. Strip-out, demolition and site preparation works
- D. Construction of the building or major renovation works
- E. Installation of energy systems or the supply of energy services
- F. Completion and handover
- G. Facilities management

Depending on the ambition level of the project and the experience of the contracting authority, not all of the GPP criteria included in this criteria set will necessarily be relevant. Moreover, depending on the preferred procurement sequence, criteria may be best addressed at specific stages. Some activities may also be let as separate contracts, thereby requiring their own criteria.

⁵ SCI Network (2013) *Procuring innovative and sustainable construction A guide for European public authorities*, www.sci-network.eu

The strategic environmental objectives and targets for a project are recommended to be determined at the outset of the project with reference to the GPP criteria set. The optimum stages for integration of GPP criteria should be identified once the procurement route has been decided. In all cases it is strongly recommended that GPP criteria are integrated into both internal project planning and the procurement process at as early a stage as possible in order to secure the desired outcomes and achieve the best value for money.

1.3 Key environmental impacts

1.3.1 The most significant environmental impacts of office buildings

Evidence gathered from office buildings across Europe indicates that their most significant environmental impacts relate to energy use during their occupation. The most significant contributors are lighting, heating, cooling and ventilation. Their relative importance primarily varies according to the thermal efficiency of the building and the climatic zone in which it is located. This highlights the importance of taking into account the overall energy performance of a building, which could include the potential to generate cleaner energy.

The production of construction products is responsible for the next most significant environmental impacts. These relate to the resources used and the emissions and ecosystem impacts associated with raw material extraction, processing and transportation. Resource use is influenced by the amount of waste generated during product manufacturing, construction on-site and demolition processes, which can be significant as a proportion of the overall material flows on a construction site. This highlights the importance of designing and specifying for resource efficiency, with the most significant building elements to address being the floors, roof, structure and external walls. In this respect the recycling and re-use of construction materials and products, as well as whole building elements, can contribute to reducing environmental impacts and development of a circular economy.

A related consideration in the case of large-volume, high-weight construction materials are impacts relating to the transportation of aggregates (natural, recycled or secondary) to production sites. Transport of these materials is typically by lorry, which results in fuel-related emissions that are generally greater than or equal to those for the production of such materials. If these materials are moved over distances greater than 25 km, the resulting emissions can contribute significantly to the environmental impacts of the production phase for the main building elements. Minimising transport-related emissions can help to promote the use of lower impact modes of transport such as rail or shipping for these materials. Finally, the use of recycled materials such as aggregates from construction and demolition waste can help develop a market for such materials, in line with EU Circular Economy objectives, and provide associated resource efficiency benefits.

A further factor to consider is the lifespan of the building and its elements, also sometimes referred to as its service life. As a general rule, the longer the lifespan of the main structural elements of the building, the lower their associated life cycle environmental impacts. This assumes, however, that the life cycle energy performance of the building as a whole (including both the use phase and the production of construction products) is prioritised as part of the overall approach during its service life. Design to facilitate the adaptation of a building and its structure once it has reached the end of its service life for the contracting authority is a further important consideration in seeking to extend a buildings lifespan.

Other factors can also influence the service life. For example, the building's functionality as a healthy and attractive working environment can contribute to a longer service lifespan and minimise the need for renovations. For example, evidence shows that in a healthy building with good indoor air quality and daylighting the workforce is more productive and there are less illness-related absences.

The integration of nature-based solutions, such as green roofs and walls, habitats in courtyards and patios, Sustainable Urban Drainage Systems (SUDS) and street trees can have multiple advantages (in addition to supporting biodiversity). Among those, we find limiting rain-water run-off, improving thermal efficiency through natural cooling, enhancing indoor air quality and making the working environment more attractive and productive.

1.3.2 How the life cycle impacts of construction materials are addressed

As already highlighted, construction materials are associated with significant environmental impacts. The criteria offer procurers and bidders a number of options for how to assess these impacts and how to choose lower impact building elements.

The criteria provide the option to make an overall assessment of the life cycle impacts of materials in order to enable bidders and their design teams to decide on improvements. These criteria are technically demanding, making them particularly suitable for more advanced projects with experienced design teams. Some criteria only address specific phases in the life cycle of a building. They are intended to promote measures to address known specific impacts and associated improvement options for specific materials. These criteria are less technically demanding and may be more suitable for less advanced projects and less experienced design teams.

The award criteria available to procurers are, in decreasing level of ambition and technical complexity, as follows:

1. **Life Cycle Assessment (LCA):** The carrying out of a Life Cycle Assessment (LCA) (see comprehensive criterion 10.1). This requires bidders to evaluate the life cycle impacts of the main building elements.
2. **Environmental Product Declarations (EPDs):** The aggregation of Environmental Product Declarations (EPDs) (see core criterion 10.1). Where the EPD criterion is used, the total embodied CO₂ equivalent emissions (Global Warming Potential) for the main building elements must also be declared (see criterion 8.2).
3. **Requiring recycled and re-used content:** This requires bidders to provide materials with a minimum requirement as regards the amount of recycled and reused content for concrete and masonry (see criterion 10.2).
4. **Requiring reduced emissions from transport for heavy materials:** This rewards low CO₂e emissions from the transportation of the aggregates used for concrete or masonry (criterion 10.3).

If a contracting authority decides to reward recycled or re-used content (3.) or reduced transport emissions (4.), it should consider setting criteria that take into account the specific conditions in the local market for construction materials. It is recommended to address potential trade-offs in environmental impacts by combining requirements on recycled and reused content and lower transport emissions. The relative weighting of the two criteria should ensure effective competition between potential suppliers whilst also encouraging tenders that deliver an overall environmental benefit.

The level of ambition chosen for the Invitation To Tender will depend on the knowledge and experience of the contracting authority, the scale of the project and a judgement on the level of experience of potential bidders. The contracting authority will need to carefully balance the different environmental and non-environmental award criteria and communicate them clearly in the ITT.

Key Environmental Areas in Office Buildings life cycle and Key Environmental Impacts

Proposed EU GPP Office Buildings approach

- Key environmental areas
- Primary energy consumption and associated greenhouse gas emissions during use of and travel to and from the building
 - Depletion of natural resources, embodied energy and emissions associated with the manufacturing and transportation of building materials
 - Waste generation during site preparation, construction, use and demolition of the building
 - Deterioration in indoor air quality due to emissions of hazardous substances from building products and the intake of particulate air pollution from the external environment
 - Pollution of the local environment and deterioration of local air quality due to emissions from vehicles used to travel to and from the building
 - Water consumption during use of the building



- Key life cycle environmental impacts and parameters for resource use:
- The following environmental impact categories along the product life cycle are considered to be the most important ones: global warming potential, acidification, exploitation of renewable and non-renewable primary energy resources eco-toxicity, human toxicity, eutrophication, abiotic resource depletion and water consumption , use of secondary and re-used materials and waste material flows

- Design and construction to achieve high energy efficiency performance and low associated CO₂ emissions
- Installation of high efficiency and renewable energy technologies which make use of site-specific opportunities to reduce energy consumption and CO₂ emissions
- Design and specification to reduce the embodied impacts and resource use associated with construction materials
- Design, specification and site management to minimise construction and demolition (C&D) waste and to use building products or materials with a high recycled or re-used content
- Specification of fit-out and finishes that minimise hazardous emissions to indoor air
- Ventilation design in order to ensure healthy air and minimise the intake of external air pollution
- Specification and installation of water saving technologies
- Installation of physical and electronic systems to support the ongoing minimisation of energy use, water use and waste arisings by facilities managers and occupiers
- Implementation of staff travel plans to reduce transport related fuel use and CO₂ emissions, including infrastructure to support electric vehicles and cycling

2 GPP CRITERIA FOR OFFICE BUILDING DESIGN, CONSTRUCTION AND MANAGEMENT

A. Selection of the design team and contractors

Core criteria	Comprehensive criteria
SUBJECT MATTER	
<p>The construction of new office buildings to high energy and environmental performance standards</p> <p style="text-align: center;"><i>or</i></p> <p>The carrying out of major renovations to existing office buildings to high energy and environmental performance standards</p>	
SELECTION CRITERIA	
<p><i>These criteria may form part of a pre-selection procedure where the services of a project manager and/or a design team are procured by the contracting authority. The number and size of executed projects to prove the experience should be proportionate to the tendered project. Design competitions may be used to encourage new companies with less experience to bid, although to balance the risk it could be requested that the design team contains experienced supporting expertise.</i></p>	
A1. Competencies of the project manager	A1. Competencies of the project manager
<p>The project manager shall have relevant competencies and experience in each of the following areas for which they would be responsible under the contract (<i>select as relevant to the specific contract</i>):</p> <ul style="list-style-type: none"> - The project management of building contracts that have met or exceeded the environmental performance requirements set by clients; - The successful identification and management of the delivery of a range of environmental technologies and design innovations required to deliver improved environmental performance and quality; - Involvement in the financial appraisal of environmental technologies and design innovations as part of the delivery of projects. <p>Verification: Evidence in the form of information and references related to relevant contracts in the previous 5 years in which the above elements have been carried out. This shall be supported by CVs for personnel who will work on the project.</p>	<p>The project manager shall have relevant competencies and experience in each of the following areas for which they would be responsible under the contract (<i>select as relevant to the specific contract</i>):</p> <ul style="list-style-type: none"> - The project management of building contracts that have met or exceeded the environmental performance requirements set by clients; - The successful identification and management of the delivery of a range of environmental technologies and design innovations required to deliver improved environmental performance and quality; - Involvement in the financial appraisal of environmental technologies and design innovations as part of the delivery of projects; - Projects that included the assessment of building environmental performance using multi-criteria building assessment, reporting and certification schemes; - The use of holistic assessment tools in the design, appraisal and specification of environmentally improved buildings, including LCC and LCA. <p>Verification: Evidence in the form of information and references related to relevant contracts in the previous 5 years in which the above elements have been carried out. This shall be supported by CVs for personnel who will work on the project.</p>

<p>A2. Competencies of the design team</p> <p>The architect, consultant and/or design team consortium shall have relevant competencies and experience in each of the following areas for which they would be responsible under the contract (<i>select as relevant to the specific contract</i>):</p> <ul style="list-style-type: none"> - The management of building contracts that have delivered environmental performance that goes beyond minimum building-code requirements (<i>specify if national, regional, local or other</i>) regarding the following aspects (<i>to be completed with elements deemed important by the contracting authority and not covered below</i>); - Energy efficient building fabric and services design for new-build or renovation projects (<i>select as appropriate</i>), including if available measured energy performance data per m² from completed projects including heating, cooling, lighting, hot water and auxiliary equipment;- Installation of Building Energy Monitoring Systems (BEMS), communication of how they work to building managers and their use to diagnose energy use patterns in buildings; - Water efficient services design, including measured water demand per employee from completed projects; - The specification, procurement and installation of low environmental impact construction materials. To include reference to EPDs in compliance with ISO 14025 or EN 15804. - The development and implementation of staff travel plans, including infrastructure for low emission vehicles and bicycles <p>Project experience and Continuous Professional Development (CPD) of relevance to these areas shall be highlighted.</p> <p><i>The contracting authority may require a minimum number of contracts according to the nature of the project.</i></p> <p>Verification:</p> <p>Evidence in the form of information and references related to relevant contracts in the previous 5 years in which the above elements have been carried out. This shall be supported by CVs of personnel who will work on the project.</p>	<p>A2. Competencies of the design team</p> <p>The architect, consultant and/or design team consortium shall have relevant competencies and experience in each of the following areas for which they would be responsible under the contract (<i>select as relevant to the specific contract</i>):</p> <ul style="list-style-type: none"> - The management of building contracts that have delivered environmental performance that goes beyond minimum building-code requirements (<i>specify if national, regional, local or other</i>) regarding the following aspects (<i>to be completed with elements deemed important by the contracting authority and not covered below</i>); - Energy efficient building fabric and services design for new-build and/or renovation projects (<i>select as appropriate</i>), including if available measured energy performance data per m² from completed projects including heating, cooling, lighting, hot water and auxiliary equipment; - The specification and design of renewable and/or high efficiency energy generation equipment; - Installation of Building Energy Monitoring Systems (BEMS), communication of how they can be used to building occupiers and their use to diagnose energy use patterns in buildings; - Water efficient services design, including measured water demand per employee from completed projects; - Bioclimatic architecture and passive design to good thermal and optical comfort, natural air purification etc; - Assessment of building environmental performance using multi-criteria building assessment and certification schemes, - The specification, procurement and installation of low environmental impact construction materials. To include reference to EPDs in compliance with ISO 14025 or EN 15804. - The use of holistic assessment tools in the design and specification of environmentally improved buildings including LCC and LCA. Comparative studies in compliance with ISO 14040/14044 or EN 15978 - Design, specification and monitoring to address daylighting and glare, thermal comfort and indoor air quality - The development and implementation of staff travel plans, including infrastructure for low emission vehicles and bicycles <p>Project experience and Continuous Professional Development (CPD) of relevance to these areas shall be highlighted.</p> <p><i>The contracting authority may require a minimum number of contracts according to the nature</i></p>
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	<p><i>of the project.</i></p> <p>Verification:</p> <p>Evidence in the form of information and references related to relevant contracts in the previous 5 years in which the above elements have been carried out. This shall be supported by CVs of personnel who will work on the project.</p>
<p>A3. Competencies of the main construction contractor and specialist contractors.</p> <p><i>These criteria may form part of a pre-selection procedure for the main contractor or where specialist contractors are to be procured e.g. demolition, ESCOs.</i></p> <p>The construction contractor shall have relevant competencies and experience in the completion of building contracts that have been shown to have delivered improved environmental performance.</p> <p>In the case of design and build contracts, criterion A1 will also be relevant to the design team employed.</p> <p>Relevant areas of experience shall include (as appropriate to the project and the selected GPP criteria):</p> <ul style="list-style-type: none"> - Energy efficient building fabric and services design for new-build or renovation projects (<i>select as appropriate</i>), including if available measured energy demand per m² from completed projects including heating, cooling, lighting, hot water and auxiliary equipment. This will have been applied in the context of new-build and/or renovation projects (select as appropriate); - The installation of Building Energy Monitoring Systems (BEMS) and communication of how they work to building managers; - The installation of water efficient services, including if available measured water demand per employee from completed projects; - The procurement, installation and verification of low environmental impact construction materials. - The successful implementation of demolition and site waste management plans in order to minimise waste arisings. Selection and knowledge of off-site treatment options. <p>Verification:</p> <p>Evidence in the form of information and references related to relevant contracts in the last 5 years in which the above elements have been carried out. This shall also be supported by CVs for personnel who will work on the project and their relevant project experience.</p>	<p>A3. Competencies of the main construction contractor and specialist contractors.</p> <p><i>These criteria may form part of a pre-selection procedure for the main contractor or where specialist contractors are to be procured e.g. demolition, ESCOs.</i></p> <p>The construction contractor shall have relevant competencies and experience in the completion of building contracts that have been shown to have delivered improved environmental performance.</p> <p>In the case of design and build contracts criteria A1 will also be relevant to the design team employed.</p> <p>Relevant areas of experience shall include (as appropriate to the project and the selected GPP criteria):</p> <ul style="list-style-type: none"> - Energy efficient building fabric and services design, including if available measured energy demand per m² from completed projects including heating, cooling, lighting, hot water and auxiliary equipment. This will have been applied in the context of new-build and/or renovation projects (select as appropriate); - The installation, commissioning and (as relevant) ongoing operation/maintenance of renewable and/or high efficiency energy generation equipment; - The installation of Building Energy Monitoring Systems (BEMS) and communication of how they work to building managers; - The installation of water efficient services, including if available measured water demand per employee from completed projects; - Functioning passive design features to achieve low energy use and good thermal and optical comfort, etc; as evidenced by post-occupancy studies; - The procurement, installation and verification of low environmental impact construction materials. Supply chain management to ensure compliance with building assessment and certification systems and in order to support modelled resource efficiency strategies; - The successful implementation of demolition site waste management plans in order to minimise waste arisings. Selection and knowledge of off-site treatment options. - The installation of features to address daylighting and glare, thermal comfort and indoor air quality

	<p>Verification: Evidence in the form of information and references related to previous contracts in the last 5 years in which the above elements have been carried out. This shall be supported by evidence and data from:</p> <ul style="list-style-type: none"> - Third party auditing, - Post-occupancy auditing, - LCA/LCC analysis and/or - Data collection from monitoring <p>This shall also be supported by CVs for personnel who will work on the project and their relevant project experience.</p>
<p>A4. Competencies of DBO contractors and property developers <i>These criteria may form part of a pre-selection procedure for the DBO contractor or property developer that will operate the building.</i> <i>The contractor shall have relevant competencies and experience in managing the construction and operation of office buildings that have been shown to have delivered improved environmental performance. Criterion A1 will also be relevant to the design team employed.</i></p> <p>Relevant areas of experience shall include (as appropriate to the project and the selected GPP criteria):</p> <ul style="list-style-type: none"> - The management of design teams to achieve the permitting and construction of office buildings that met client performance requirements, including under DBO arrangements; - The management of main contractors for the construction of office buildings that have environmentally improved performance, including under DBO arrangements; - Ongoing facilities management in order to optimise the performance of office buildings, including the use of systems such as BEMS, the contracting of energy managers and the ongoing monitoring/reporting on performance; <p>Verification: Evidence in the form of information and references related to previous projects and contracts in the last 5 years in which the above elements have been carried out. This shall also be supported by CVs for personnel who will work on the project and their relevant project experience.</p>	<p>A4. Competencies of DBO contractors and property developers <i>These criteria may form part of a pre-selection procedure for the DBO contractor or property developer that will operate the building.</i> <i>The contractor shall have relevant competencies and experience in managing the construction and operation of office buildings that have been shown to have delivered improved environmental performance. Criterion A1 will also be relevant to the design team employed.</i></p> <p>Relevant areas of experience shall include (as appropriate to the project and the selected GPP criteria):</p> <ul style="list-style-type: none"> - The management of design teams to achieve the permitting and construction of office buildings that met client performance requirements, including under DBO arrangements; - The management of main contractors for the construction of office buildings that have environmentally improved performance, including under DBO arrangements.; - The management of design teams and/or main contractors to obtain ratings according to multi-criteria building assessment and certification schemes; - Ongoing facilities management in order to optimise the performance of office buildings, including the use of systems such as BEMS, the contracting of energy managers and the ongoing monitoring/reporting on performance; <p>Verification: Evidence in the form of information and references related to previous projects and contracts in the last 5 years in which the above elements have been carried out. This shall also be supported by CVs for personnel who will work on the project and their relevant project experience.</p>

A5. Energy Management System

(Same requirements for Core and Comprehensive criteria)

These criteria may form part of a pre-selection procedure for a developer and/or operator (facilities manager) of the office building.

The DBO contractor or property developer who will operate the building shall be able to demonstrate experience in implementing energy management systems for sites, such as ISO 50001 or equivalent, as part of facilities management arrangements.

Verification:

The DBO contractor or property developer shall provide management system certifications for sites they operate or have operated over the last three years.

Supporting notes:

- The evaluation of consultants, design teams and contractors requires an experienced evaluation panel. It may be appropriate to bring in external expertise, which may include appointment of a project manager, and the setting up of a panel with the knowledge and experience to judge the experience of competing contractors. The lists included in selection criterion 1 and 2 are indicative and should be adapted to the project and the procurement stage.
- In the reform of the Public Procurement Directives^{6 7} (published in the Official Journal 28th March 2014 and requiring transposition by Member States within 24 months), it is explicitly stated (Art. 66 of Directive 2014/24/EU) that the organisation, qualification and experience of staff assigned to performing the contract (where the quality of the staff assigned can have a significant impact on the level of performance of the contract) can be a criterion for awarding a contract. For complex contracts such as building contracts it can usually be expected that the quality of the project managers, design team, specialist consultants and contractors can have a significant impact on the performance of the project. Please note that the educational and professional qualifications of the service provider or contractor or those of the undertaking's managerial staff may only be evaluated *once* in a tender procedure, either at selection stage or as an award criterion (Annex XII, Part 2 f of Directive 2014/24/EU).

⁶ Directive 2014/24/EU of the European Parliament and of the Council of 26 February 2014 on public procurement and repealing Directive 2004/18/EC

⁷ Directive 2014/25/EU of the European Parliament and of the Council of 26 February 2014 on procurement by entities operating in the water, energy, transport and postal services sectors and repealing Directive 2004/17/

B. Detailed design and performance requirements

Core criteria	Comprehensive criteria
TECHNICAL SPECIFICATIONS	
<p>B1. Minimum Energy performance</p> <p><i>It is advised to have a discussion with the local building control competent authority who will be able to provide guidance on the most appropriate performance benchmark to use.</i></p> <p>The calculated energy performance of an office building shall meet the following requirements, which can be set in relation to either energy performance or cost:</p> <p style="padding-left: 20px;">Option 1: Energy performance:</p> <ul style="list-style-type: none"> ○ For new-build projects, an Energy Performance Certificate (EPC) class C or three times the kWh/m² cut-off value⁸ for the best class or a maximum of 135 kWh/m² (<i>whichever is the strictest</i>); <p style="padding-left: 20px;">For major renovations, an EPC class D or four times the kWh/m² cut-off value for the best class or a maximum of 170 kWh/m² (<i>whichever is the strictest</i>),</p> <p style="padding-left: 20px;">Option 2: Cost optimal performance</p> <ul style="list-style-type: none"> ○ For new-build and major renovation projects, the cost optimum primary energy demand for a <i>public office building</i> expressed in kWh/m² as calculated according to the methodology in Commission Delegated Regulation No 244/2012. <p>Where the national minimum requirement is stricter than these requirements, the award criterion 8.1 shall be used instead of this criterion to <i>encourage further cost effective improved performance</i>.</p> <p>Verification:</p> <p>The Design team or the Design & Build tenderer shall submit information demonstrating that the building design to be submitted to the local building control for permitting complies with the GPP requirements.</p> <p>This shall consist of the energy performance of the building calculated according to EN 15603 or equivalent, or the national calculation methodology applicable where the building is situated.</p>	<p>B1. Minimum Energy performance</p> <p><i>It is advised to have a discussion with the local building control competent authority who will be able to provide guidance on the most appropriate performance benchmark to use.</i></p> <p>The calculated energy performance of an office building shall meet the following requirements:</p> <ul style="list-style-type: none"> ○ For new-build projects an Energy Performance Certificate (EPC) class B or two times the kWh/m² cut-off value⁸ for the best class or a maximum of 100 kWh/m² (<i>whichever is the strictest</i>); ○ For major renovations an EPC class C or three times the cut-off⁸ for the best class or a maximum of 135 kWh/m² (<i>whichever is the strictest</i>). <p>Where the national minimum requirement or, the national requirement for 'Nearly Zero Energy Buildings' as of 31st December 2018, is stricter than the above requirements, award criterion B8.1 shall be used instead in order to <i>encourage further cost effective improved performance and deep renovations</i>. Technical specification B9 shall also be used to require contributions from <i>low and zero carbon energy technologies</i>.</p> <p>A dynamic thermal simulation model compliant with the ISO 13790 hourly method or equivalent shall be used to validate the heating and cooling performance. For major renovations input data reflecting surveyed construction details of the building shall be used.</p> <p>Verification:</p> <p>The Design team or the Design & Build tenderer or the DBO tenderer shall submit the following information demonstrating that the building design to be submitted to the local building control for permitting complies with the GPP requirements.</p> <p>This shall consist of the energy performance of the building calculated according to EN 15603 or equivalent, or the national calculation methodology applicable where the building is situated. This shall be validated by the results of modelling according to ISO 13790 or equivalent.</p> <p>The calculations shall be verified by either a competent authority⁶ or building assessor certified to use the relevant methodologies and calculation methods.</p>

⁸ The cut-off value represents the highest energy demand (expressed in kWh/m²) that is permitted within an EPC class.

<p>A cost optimality calculation shall additionally be provided following the stated methodology. The calculations shall be verified by either a competent authority⁹ or a building assessor certified to use the methodology.</p>	
<p>B2. Lighting control systems <i>(Same requirements for Core and Comprehensive criteria)</i> <i>Lamps and lighting design are recommended to be procured with reference to the indoor lighting EU GPP criteria.</i></p> <p>Where lighting control systems are not a minimum requirement in a Member State or their contribution is not taken into account in the national calculation method, occupancy sensors shall be installed in line with Technical Specification 3.2.3 of the indoor lighting EU GPP criteria (published in 2012). The indoor lighting EU GPP criteria are available here: http://ec.europa.eu/environment/gpp/pdf/Indoor%20Lighting%20-%20EU%20GPP%20Criteria%20Final%20draft.pdf</p> <p>In addition, occupiers shall be able to control or override lighting systems in local zones or rooms within the building.</p> <p>Verification:</p> <p>The Design team or the Design & Build tenderer or the DBO tenderer shall provide technical specifications for the lighting control systems to be installed. Verification relating to commissioning and handover is addressed in Section F3.</p>	<p>Where lighting control systems are not a minimum requirement in a Member State or their contribution is not taken into account in the national calculation method, occupancy sensors shall be installed in line with Technical Specification 3.2.3 of the indoor lighting EU GPP criteria (published in 2012). The indoor lighting EU GPP criteria are available here: http://ec.europa.eu/environment/gpp/pdf/Indoor%20Lighting%20-%20EU%20GPP%20Criteria%20Final%20draft.pdf</p> <p>In addition, occupiers shall be able to control or override lighting systems in local zones or rooms within the building.</p> <p>Verification:</p> <p>The Design team or the Design & Build tenderer or the DBO tenderer shall provide technical specifications for the lighting control systems to be installed. Verification relating to commissioning and handover is addressed in Section F3.</p>
<p>B3. Building energy management system</p> <p>A building energy management system (BEMS) shall be installed and commissioned that provides occupants and facilities managers with real-time information on the building's energy use by using networked sensors and a minimum of half hourly utility metering.</p> <p>The user interface shall allow for information on the buildings energy use to be analysed and downloaded by occupants and facilities managers without requiring significant training.</p> <p>The performance of key aspects of the building that can be controlled by the system shall be easy to adjust i.e. lighting, heating, cooling.</p> <p>Verification:</p> <p>The Design team or the Design & Build tenderer or the DBO tenderer shall provide specifications for the BEMS including information about the user interface. They shall additionally demonstrate how information will be displayed, reported and made available to at least the facilities and/or energy managers for the building.</p>	<p>B3. Building energy management system</p> <p>A building energy management system (BEMS) shall be installed and commissioned that provides occupants and facilities managers with real-time information on the building's energy use by using networked sensors and a minimum of half hourly utility metering.</p> <p>The user interface shall allow for information on the buildings energy use to be analysed and downloaded by occupants and facilities managers without requiring significant training. Occupants shall also be able to adjust comfort conditions in zones of the building.</p> <p>The performance of key aspects of the building that can be controlled by the system shall be easy to adjust i.e. lighting, heating, cooling. Additionally the system shall allow for:</p> <ul style="list-style-type: none"> - Analysis and control of energy uses for different zones within the building (as a minimum for heating, cooling, lighting); - Performance optimisation according to ambient conditions inside and outside the building, and; - Diagnosis of the reason for any deviations from design performance.

⁹ A competent authority is a national, regional or local body that is designated to implement independent control of minimum building energy performance, energy performance certificates and building inspections.

	<p>Verification:</p> <p>The Design team or the Design & Build tenderer or the DBO tenderer shall provide specifications for the BEMS including information about the user interface. They shall additionally demonstrate how information will be displayed, reported and made available to at least the facilities and/or energy managers for the building.</p>
<p>B4. Low or zero carbon energy sources</p> <p>Where the building is located so as to benefit from the potential to connect to a high efficiency and cost-effective alternative energy systems, the building's energy systems shall be designed to connect to this infrastructure.</p> <p>Verification:</p> <p>The Design team or the Design & Build tenderer or the DBO tenderer shall identify where existing infrastructure exists and determine whether it would be beneficial environmentally for the building to connect to this infrastructure. The primary energy savings shall be quantified.</p>	<p>B4. Low or zero carbon energy sources</p> <p>A minimum of 10% of the primary energy demand for the building shall be supplied/generated by localised renewable energy sources or high efficiency and cost-effective alternative systems installed within the curtilage of the building or which are shared with other buildings.</p> <p><i>The minimum requirement could be varied depending on the local context. This could be set with reference to local planning policies and/or a scoping study for the site.</i></p> <p>Verification:</p> <p>The Design team or the Design & Build tenderer or the DBO tenderer shall provide designs and drawings for the energy systems to be installed together with calculations of their modelled energy generation and the net contribution to the building's primary energy use.</p>
<p>B5. Staff travel plan and infrastructure</p> <p><i>The criterion on the Staff Travel Plan can be combined with an award criterion assessing the quality of the plan.</i></p> <p>A staff travel plan shall be developed for the building in consultation with the contracting authority, the local planning authority and relevant infrastructure providers. The plan shall identify specific measures that, taking into account the local context, may reduce the need for commuting to the building by private car and promote the use of more sustainable modes of transport, to include cycling and walking, public transport, low emission vehicles, and car sharing.</p> <p>As a minimum, secure, covered and easily accessible bicycle storage shall be integrated into the design of the building. <i>The number of spaces should be set with reference to local standards or building assessment scheme by taking into account a possible projected increase following the implementation of the staff travel plan.</i></p> <p>Verification:</p> <p>Design teams or contractors shall provide plans of the building showing the electric vehicle and bicycle storage space(s) and associated service points to be provided. In addition, the assumptions made in order to estimate the space provision shall be provided. Design teams or contractors shall provide an outline of a staff travel plan.</p>	<p>B5. Staff travel plan and infrastructure</p> <p><i>The criterion on the Staff Travel Plan can be combined with an award criterion assessing the quality of the plan.</i></p> <p>A staff travel plan shall be developed for the building in consultation with the contracting authority, the local planning authority and relevant infrastructure providers. The plan shall identify specific measures that, taking into account the local context, may reduce the need for commuting to the building by private car and promote the use of more sustainable modes of transport, to include cycling and walking, public transport, low emissions vehicles, and car sharing.</p> <p>As a minimum, space and infrastructure for the following modes of transport shall be integrated into the design of the building:</p> <ul style="list-style-type: none"> - Electric vehicles: Dedicated parking spaces together with associated electric recharging points; - Bicycle storage: Secure, covered and easily accessible bicycle storage with e-bike re-charging points. <p><i>The number of spaces in both cases should be set with reference to local standards or building assessment scheme requirements.</i></p>

	<p>Verification:</p> <p>Design teams or contractors shall provide plans of the building showing the electric vehicle and bicycle storage space(s) and associated service points to be provided. In addition, the assumptions made in order to estimate the space provision shall be provided. Design teams or contractors shall provide an outline of a staff travel plan.</p>
<p>B5. Recyclable waste storage (<i>Same requirements for Core and Comprehensive criteria</i>)</p> <p>Dedicated storage space shall be provided within the building, or within the curtilage of the building, to facilitate the segregation of recyclable materials and end-of-life products by occupiers (with reference to the requirements in Section F5).</p> <p>The waste collection area(s) shall be sized based on the likely level of occupation in order to accommodate sufficient containers to maximise recycling whilst also handling residual waste.</p> <p>Verification:</p> <p>Design teams or contractors shall provide plans of the building showing the space(s) that have been designated for waste segregation and collection as well as the assumptions made in order to estimate the space provision.</p>	
<p>B6. Water saving installations (<i>Same requirements for Core and Comprehensive criteria</i>)</p> <p>All sanitary and kitchen water facilities shall be equipped with water efficient fittings that are in compliance with the criteria for sanitary tapware and toilets and flushing urinals:.</p> <p>EU GPP criteria for sanitary tapware: http://ec.europa.eu/environment/gpp/pdf/criteria/sanitary/EN.pdf</p> <p>EU GPP criteria for toilets and urinals: http://ec.europa.eu/environment/gpp/pdf/criteria/toilets/criteria_Toilets_en.pdf</p> <p>Verification:</p> <p>See the respective EU GPP criteria documents</p>	
<p>B7.1 Thermal comfort conditions</p> <p>Design indoor temperature values (minimum room temperature in winter, maximum room temperature in summer) for the office building shall comply with at least category II in accordance with EN 15251 or equivalent. Annex A1 shall be referred to for mechanically cooled buildings and A2 for passively cooled buildings.</p> <p>Verification:</p> <p>Design teams or the Design & Build contractor shall provide modelling data for the room temperatures.</p>	<p>B7.1 Thermal comfort conditions</p> <p>Design indoor temperature values (minimum room temperature in winter, maximum room temperature in summer) for the office building shall comply with at least category I in accordance with EN 15251 or equivalent. Annex A1 shall be referred to for mechanically cooled buildings and A2 for passively cooled buildings.</p> <p>Compliance shall be demonstrated using dynamic thermal simulation modelling carried out according to EN ISO 13790 hourly method or equivalent.</p> <p>Verification:</p> <p>Design teams or the Design & Build contractor or the DBO contractor shall provide modelling data for the room temperatures.</p>

<p>B7.2 Daylighting and glare control</p> <p>Useable office space shall for 80% of the useable floor area achieve an average Daylight Factor of 1.5% for externally facing facades and 0.7% for interior facing facades.. Both shall be measured at a working plane height which shall be defined by the contracting authority.</p> <p>Locations within the building that may be sensitive to glare shall be identified and control measures to limit direct or indirect glare in these locations shall be specified.</p> <p>Verification:</p> <p>Design teams or the Design & Build contractor or the DBO contractor shall provide modelling data for daylighting conditions and glare identification together with a glare control strategy.</p>	<p>B7.2 Daylighting and glare control</p> <p>Dynamic modelling shall be used to demonstrate that during a year the useable office space achieves for a minimum of 55% of the occupied hours:</p> <ul style="list-style-type: none"> - Spatial Daylight Autonomy of ≥ 300 lux on the working plane, and; - A Daylight Glare Probability value of $\leq 40\%$ for locations that exceed 1000 lux (without solar control measures installed). <p>Both shall be measured at a working plane height which shall be defined by the contracting authority. DGP shall be measured for views of the windows at eye level.</p> <p>Verification:</p> <p>Design teams or the Design & Build contractor or the DBO contractor shall provide a summary report based on one years' modelling data for daylighting and glare levels.</p>
<p>B7.3 Ventilation and air quality</p> <p>The ventilation system shall be specified to supply indoor air with a quality rating of IDA 2 according to EN 15251 or equivalent.</p> <p>In locations with poor outdoor air quality, the ventilation systems of the building shall be designed to ensure that clean air is supplied to the offices in compliance with the following criterion:</p> <ul style="list-style-type: none"> - No air intake should be positioned on a façade or facades exposed to busy roads (<i>road to be indicated in the ITT</i>). Where this is not possible, the opening should be positioned as high above the ground as possible. The design shall additionally be in compliance with guidance A2.2 in EN 13779; - Ventilation system filters shall be in compliance with the specifications in table A.5 of EN 13779 or equivalent. <p>Poor air quality is defined as outdoor air (ODA) class 2 or 3 according to EN 13779.</p> <p>Verification:</p> <p>The design team or the DBO contractor shall demonstrate the buildings compliance with the IDA quality rating criteria in EN 15251 or equivalent. Drawings and plans of the ventilation services detailing the air intake locations shall be provided. These shall be provided at the detailed design stage and upon completion. They shall also obtain local air monitoring data from the local public authority enabling classification the location according to EN 13779.</p>	<p>B7.3 Ventilation and air quality</p> <p>The ventilation system shall be specified to supply air with a quality rating of IDA 1 according to EN 15251 or equivalent.</p> <p>In locations with poor outdoor air quality the ventilation systems of the building shall be designed to ensure that clean air is supplied to the offices in compliance with the following criterion:</p> <ul style="list-style-type: none"> - Air intakes shall be located at least 20 metres¹⁰ from sources of poor air quality (as defined below). Where this is not possible, the opening should be positioned as high above the ground as possible. The design shall additionally be in compliance with guidance A2.2 in EN 13779.; - Ventilation system filters shall be in compliance with the specifications in table A.5 of EN 13779 or equivalent. <p>Poor air quality is defined as outdoor air (ODA) class 2 or 3 according to EN 13779.</p> <p>Verification:</p> <p>The design team or the DBO contractor shall demonstrate the buildings compliance with the IDA quality rating criteria in EN 15251 or equivalent. Drawings and plans of the ventilation services detailing the air intake locations shall be provided. These shall be provided at the detailed design stage and upon completion. They shall also provide local air monitoring data from the local public authority enabling classification of the location according to EN 13779.</p>

¹⁰ This should be the geometric distance measured over the surfaces of the public realm and the building and not a linear distance from point to point. Sometimes this may be referred to in Computer Aided Design (CAD) as a multiple or segmented line, or a polyline.

AWARD CRITERIA	
<p>B8.1 Minimum Energy performance requirements</p> <p><i>This criterion supplements and encourages further performance improvements over and above the requirements of criterion B1.</i></p> <p>The procurer shall award points according to the modelled improvement in the energy performance of the building upon those in criterion B1. This could be based on the EPC rating or could be in gradations of improvement of 15 kWh/m².</p> <p>Verification: see criterion B1.</p>	<p>B8.1 Minimum Energy performance requirements</p> <p><i>This criterion supplements and encourages further performance improvements over and above the requirements of criterion B1.</i></p> <p>The procurer shall award points according to the modelled improvement in the energy performance of the building <i>either</i>:</p> <ul style="list-style-type: none"> o In proportion to how close the proposed design approaches the Member States national Nearly Zero Energy requirements in kWh/m² or, <i>if these are not defined</i>, o On the basis of a comparison of design proposals that, depending on the prevailing national minimum requirements, have a primary energy demand: <ul style="list-style-type: none"> i) Renovations: Up to 100 kWh/m² ii) New-build: Up to 60 kWh/m² <p>The points could be awarded in gradations of improvement of 15 kWh/m². In all cases the combinations of measures used to achieve this performance shall result in a positive Net Present Value when the Cost-Optimal calculation methodology for a <i>public sector office building</i> is calculated according to the methodology in Commission Delegated Regulation No 244/2012.</p> <p>Verification: see criterion B1.</p>
<p>B8.2 Building life cycle GWP</p> <p><i>(Same requirements for Core and Comprehensive criteria)</i></p> <p><i>Points shall be awarded where award criterion B10.1 for EPDs is also included in the ITT. The Global Warming Potential (GWP)¹¹ of the buildings predicted energy performance shall be calculated over the service life used in B10.1. The GWP results for B1 and B10.1 shall be added together. Points shall be awarded to the bidders with the lowest total GWP.</i></p> <p>Verification: Performance data from the verification of criterion B1 and B10.1 shall be used to calculate the GWP. The data and calculations shall be presented in a summary form.</p>	<p>B9. Low or zero carbon energy sources</p> <p><i>This criterion supplements and encourages improved performance over and above the requirements of criterion B4.</i></p> <p>The procurer shall award points in proportion to the additional primary energy demand for the</p>

¹¹ Where the output from B1 is in kWh then this shall be converted to GWP using emissions factors for the electricity mix and the fuels used as specified in the Product Category Rules for the EPD system.

	<p>building to be supplied/generated by localised renewable energy sources or high efficiency alternative systems installed within the curtilage of the building or which are shared with other buildings.</p> <p>Verification:</p> <p>The Design team (in the case of a Design Contest) or Design & Build contractor or DBO contractor shall provide designs and drawings for the energy systems to be installed together with calculations of their modelled energy generation and the net contribution to the building's primary energy use.</p>								
<p>B10.1 Performance of the main building elements: Aggregation of Environmental Product Declarations (EPDs)</p> <p><i>This criterion shall be used in combination with the award core criterion B8. Minimum Energy performance requirements, in order to take into consideration the building's use phase.</i></p> <p><i>This criterion may only be applied where a Bill of Quantities¹² for a reference building is to be provided to bidders as the basis for comparison or where designs submitted by different bidders are to be compared during a competitive process.</i></p> <p><i>Additional technical guidance shall be followed during the procurement process, as provided in Annex 1 (EPD option).</i></p> <p><i>A technical evaluator specialised in LCA shall assist in preparing the ITT and shall carry out a critical review of the submissions.</i></p> <p>The procurer shall award points based on the improvement in life cycle performance of the main building elements listed in Table a in comparison with a reference building or other competing designs. This shall be according to option 1 (based on EPDs) as presented below.</p> <p><i>The basis for the comparison and the option to be used shall be specified in the ITT.</i></p> <p><i>Table a. Scope of the building elements to be evaluated</i></p> <table border="1" data-bbox="1062 1122 1313 2058"> <thead> <tr> <th data-bbox="1062 1592 1094 2058">New-build</th> <th data-bbox="1062 1122 1094 1592">Renovation</th> </tr> </thead> <tbody> <tr> <td data-bbox="1094 1592 1313 2058"> <ul style="list-style-type: none"> - Foundations and substructures - The structural frame, including beams, columns and slabs - External walls, cladding and insulation - Floors and ceilings - Internal walls - Windows - Roofs </td> <td data-bbox="1094 1122 1313 1592"> <ul style="list-style-type: none"> - External walls, cladding and insulation - Re-roofing and insulation - Windows Where additional floors or building extensions are foreseen that account for >25% of the existing useable floor area, the list of new-build elements shall also apply. </td> </tr> </tbody> </table>	New-build	Renovation	<ul style="list-style-type: none"> - Foundations and substructures - The structural frame, including beams, columns and slabs - External walls, cladding and insulation - Floors and ceilings - Internal walls - Windows - Roofs 	<ul style="list-style-type: none"> - External walls, cladding and insulation - Re-roofing and insulation - Windows Where additional floors or building extensions are foreseen that account for >25% of the existing useable floor area, the list of new-build elements shall also apply. 	<p>B10.1 Performance of the main building elements: Carrying out of a Life Cycle Assessment (LCA)</p> <p><i>When this criterion is used, the award core criterion B8. Minimum Energy performance requirements shall not be used, in order to avoid double counting of the building's use phase.</i></p> <p><i>This criterion may only be applied where a Bill of Quantities⁸ for a reference building is to be provided to bidders as the basis for comparison or where designs submitted by different bidders are to be compared during a competitive process.</i></p> <p><i>Additional technical guidance shall be followed during the procurement process, as provided in Annex 2 (LCA options).</i></p> <p><i>A technical evaluator specialised in LCA shall assist in preparing the ITT and shall carry out a critical review of the submissions.</i></p> <p>The procurer shall award points based on the improvement in life cycle performance of the main building elements listed in Table b in comparison with a reference building or other competing designs. This shall be according to option 2 (based on an LCA) as presented below.</p> <p>The basis for the comparison and the option to be used shall be specified in the ITT.</p> <p><i>Table b. Scope of the building elements to be evaluated</i></p> <table border="1" data-bbox="1062 163 1313 1115"> <thead> <tr> <th data-bbox="1062 640 1094 1115">New-build</th> <th data-bbox="1062 163 1094 640">Renovation</th> </tr> </thead> <tbody> <tr> <td data-bbox="1094 640 1313 1115"> <ul style="list-style-type: none"> - Foundation and substructures - The structural frame, including beams, columns and slabs - External walls, cladding and insulation - Floors and ceilings - Internal walls - Windows - Roofs </td> <td data-bbox="1094 163 1313 640"> <ul style="list-style-type: none"> - External walls, cladding and insulation - Re-roofing and insulation - Windows Where additional floors or building extensions are foreseen that account for >25% of the existing useable floor area, the list of new-build elements shall also apply. </td> </tr> </tbody> </table>	New-build	Renovation	<ul style="list-style-type: none"> - Foundation and substructures - The structural frame, including beams, columns and slabs - External walls, cladding and insulation - Floors and ceilings - Internal walls - Windows - Roofs 	<ul style="list-style-type: none"> - External walls, cladding and insulation - Re-roofing and insulation - Windows Where additional floors or building extensions are foreseen that account for >25% of the existing useable floor area, the list of new-build elements shall also apply.
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¹² A Bill of Quantities is defined as 'a list of items giving detailed identifying descriptions and firm quantities of the work comprised in a contract' (RICS 2011)

<p>The performance shall be evaluated using Environmental Product Declarations (EPDs) that are in compliance with ISO 14025 or EN 15804. The ITT shall specify which of the following three methods shall be used for the evaluation:</p> <ul style="list-style-type: none"> (i) Simplified option: Aggregation of the Global Warming Potential (GWP) indicator results for each building element, declared as CO₂ equivalent emissions; (ii) Indicator results option: Aggregation of the EPD characterisation results (the LCA results for indicators) for each building element, <i>or</i> (iii) Score or rating option: Aggregation of the weighted EPD scores or ratings (usually a numeric score or letter rating) for each building element. <p>The Product Category Rules (PCRs)¹³ for the EPDs shall be specified in the ITT and all bidders shall aggregate EPDs from the PCRs, which shall be in accordance with ISO 14025 or EN 15804. Only third party verified PCRs shall be used. This shall include verification of primary data.</p> <p>In some Member States there may already be permitting requirements and associated rules for buildings to declare GWP, in which case the bidders shall declare according to these rules. Normalisation and weighting to give a score or rating for building elements shall be permitted where national PCRs have been established in support of building permitting requirements or a building assessment and certification scheme.</p> <p><i>Where analysis using EPDs is carried out prior to procurement of the main contractor, the design team shall provide the contracting authority with a summary of the key technical assumptions used so that they can be included in the tender specifications.</i></p> <p>Verification:</p> <p>The Design team or the Design & Build tenderer shall provide a bill of materials for the proposed design and the EPD results, which shall be reported according to ISO 14025 or EN 15804. The comparison with the reference building shall be written up in a concise technical report that compares the proposed design option(s) and calculates the improvement potential. The technical report shall describe how the 'technical points to address' (as set out in Annex 1) have been covered.</p> <p>Where the results from a building assessment and certification system are used, the tenderer's accredited building assessor shall provide verification according to the methodology used by the system.</p> <p><i>The technical report shall be subject to a critical review by the contracting authorities</i></p>	<p>The performance shall be evaluated by carrying out a Life Cycle Assessment (LCA) of the building in accordance with ISO 14040/14044, or EN 15978. The ITT shall specify which of the following methods shall be used for the evaluation:</p> <ul style="list-style-type: none"> (i) Impact Category results: The aggregated characterisation results for each indicator obtained using the specified LCA method; (ii) LCA tool score: A single score obtained using a national or regional building LCA tool used by public authorities; (iii) Building assessment scheme LCA score: A normalised and weighted scoring derived from an LCA-based criterion within a national or regional building assessment and certification scheme used by public authorities. <p>In each case the methodology shall include, as a minimum, the Lifecycle Impact Category Indicators specified in Annex 2</p> <p><i>Where an LCA analysis is carried out prior to procurement of the main contractor, the design team shall provide the contracting authority with a summary of the key technical assumptions used so that they can be included in the tender specifications.</i></p> <p>Verification:</p> <p>The Design team or the Design & Build tenderer or the DBO tenderer shall provide a bill of materials for the proposed design and the LCA results, which shall be reported according to ISO 14044 or EN 15978. The comparison with the reference building shall be written up in a concise technical report that compares the proposed design option(s) and calculates the improvement potential. The technical report shall describe how the 'technical points to address' (as set out in Annex 2) have been covered.</p> <p>Where the results from a building assessment and certification system are used, the tenderer's accredited building assessor shall provide verification according to the methodology used by the system.</p> <p><i>The technical report shall be subject to a critical review by the contracting authorities appointed LCA technical evaluator. The critical review shall follow the guidelines in Annex 3.</i></p>
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¹³ Product Category Rules are required to be followed for the production of each EPD within a scheme. They define how life cycle assessment shall be carried out and verified for each product so as to ensure consistency.

<p><i>appointed LCA technical evaluator. The critical review shall follow the guidelines in Annex 3.</i></p>									
<p>B10.2 Incorporation of recycled content in concrete and masonry</p> <p><i>This criterion shall be used where a concrete and masonry structural solution is to be designed by all bidders. It is recommended to consider combining it with criterion B10.3, but should not be used if criterion B10.1 is selected¹⁴</i></p> <p><i>This criterion is applicable to office buildings with concrete structural frames, blockwork walls and in-fill and masonry internal and external walls.</i></p> <p>The procurer shall award points to tenderers that achieve greater than or equal to 15% by value of recycled content and/or by-products¹⁵ for the sum of the main building elements in Table c.</p> <p><i>The minimum content requirement could be set higher if agreement is reached with the design team prior to tendering for the main contractor.</i></p> <p><i>Table c. Scope of the building elements to be included</i></p> <table border="1" data-bbox="639 1122 895 2058"> <thead> <tr> <th data-bbox="644 1585 667 2058">New-build</th> <th data-bbox="644 1122 667 1585">Renovation</th> </tr> </thead> <tbody> <tr> <td data-bbox="671 1585 890 2058"> <ul style="list-style-type: none"> - The structural frame, including beams, columns and slabs - External walls - Floors and ceilings - Internal walls - Roofs - Foundations and substructure </td> <td data-bbox="671 1122 890 1585"> <ul style="list-style-type: none"> - External walls - Internal walls - Re-roofing <p>Where additional floors or building extensions are foreseen that account for >25% of the existing useable floor area, the list of new-build elements shall also apply.</p> </td> </tr> </tbody> </table> <p>The recycled content shall be calculated on the basis of an average mass balance of recycled materials and/or by-products according to how they are produced and delivered to site (as applicable):</p> <ul style="list-style-type: none"> - For each ready mixed batch from which deliveries are dispatched to the construction site, in accordance with EN 12620 (aggregates for concrete) and EN 206 (concrete) or equivalent; - On an annual basis for factory made panels, columns, blocks and elements with claimed content levels, in accordance with EN 12620 (aggregates for concrete) and EN 206 (concrete) or equivalent; <p>Verification: The tenderers for main contractor, the Design & Build contractor or the DBO</p>	New-build	Renovation	<ul style="list-style-type: none"> - The structural frame, including beams, columns and slabs - External walls - Floors and ceilings - Internal walls - Roofs - Foundations and substructure 	<ul style="list-style-type: none"> - External walls - Internal walls - Re-roofing <p>Where additional floors or building extensions are foreseen that account for >25% of the existing useable floor area, the list of new-build elements shall also apply.</p>	<p>B10.2 Incorporation of recycled or re-used content in concrete and masonry</p> <p><i>This criterion shall be used where a concrete and masonry structural solution is to be designed by all bidders. It is recommended to consider combining it with criterion B10.3, but should not be used if criterion B10.1 is selected¹⁰</i></p> <p><i>This criterion is applicable to office buildings with concrete structural frames, blockwork walls and in-fill and masonry internal and external walls.</i></p> <p>The procurer shall award points to tenderers that achieve greater than or equal to 30% by value of recycled content, re-used content and/or by-products¹¹ for the sum of the main building elements in Table d.</p> <p><i>The minimum content requirement could be set higher if agreement is reached with the design team prior to tendering for the main contractor.</i></p> <p><i>The contracting authority may choose to allocate more points to re-used content according to the local conditions. This could include favouring designs that re-use the primary load bearing structure of an existing building.</i></p> <p><i>Table d. Scope of the building elements to be included</i></p> <table border="1" data-bbox="775 161 1031 1115"> <thead> <tr> <th data-bbox="780 640 802 1115">New-build</th> <th data-bbox="780 161 802 640">Renovation</th> </tr> </thead> <tbody> <tr> <td data-bbox="807 640 1026 1115"> <ul style="list-style-type: none"> - The structural frame, including beams, columns and slabs - External walls - Floors and ceilings - Internal walls - Roofs - Foundation and substructure </td> <td data-bbox="807 161 1026 640"> <ul style="list-style-type: none"> - External walls - Internal walls - Re-roofing <p>Where additional floors or building extensions are proposed are foreseen that account for >25% of the existing useable floor area, the list of new-build elements shall also apply.</p> </td> </tr> </tbody> </table> <p>The recycled or re-used content shall be calculated on the basis of an average mass balance of recycled materials and/or by-products according to how they are produced and delivered to site (as applicable):</p> <ul style="list-style-type: none"> - For each ready mixed batch from which deliveries are dispatched to the construction 	New-build	Renovation	<ul style="list-style-type: none"> - The structural frame, including beams, columns and slabs - External walls - Floors and ceilings - Internal walls - Roofs - Foundation and substructure 	<ul style="list-style-type: none"> - External walls - Internal walls - Re-roofing <p>Where additional floors or building extensions are proposed are foreseen that account for >25% of the existing useable floor area, the list of new-build elements shall also apply.</p>
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¹⁴ If specific local conditions and planning policies support the use of recycled content, the contracting authority can evaluate, on a case by case basis, the possibility to include a criterion on recycled content within the ITT alongside the holistic criterion B10.1 EPD/LCA. The assumptions and life cycle inventory data relating to the production and construction phase of the recycled materials would need to be included in the response to B10.1.

¹⁵ A by-product is defined in art. 5 of the Waste Framework Directive as 'A substance or object, resulting from a production process, the primary aim of which is not the production of that item....'

<p>contractor shall propose the total recycled content quantifying the proportional contribution of the total recycled content to the overall value of the specified building elements, based on the information provided by the producer (s) of the construction product.</p> <p>The tenderers for main contractor, the Design & Build contractor or the DBO contractor shall describe how the overall value will be calculated and verified, including, as a minimum, batch documentation, factory production control documentation and delivery documentation, and how the third party verification will be arranged during the construction phase.</p> <p><i>The ordering and delivery to site of these building elements shall later be verified by the main construction contractor (see Section D6).</i></p>	<p>site, in accordance with EN 12620 (aggregates for concrete) and EN 206 (concrete) or equivalent;</p> <ul style="list-style-type: none"> - On an annual basis for factory made panels, columns, blocks and elements with claimed content levels, in accordance with EN 12620 (aggregates for concrete) and EN 206 (concrete) or equivalent; - Whole re-used products, including confirmation of their origin. <p>Verification: The tenderers for main contractor or the Design & Build contractor or the DBO contractor shall propose the total recycled content quantifying the proportional contribution of the recycled or re-used content to the overall value of the specified building elements, based on the information provided by the producer(s) of the construction product.</p> <p>The tenderers for main contractor, the Design & Build contractor or the DBO contractor shall describe how the overall value will be calculated and verified, including, as a minimum, batch documentation, factory production control documentation and delivery documentation, and how the third party verification will be arranged during the construction phase.</p> <p><i>The ordering and delivery to site of these building elements shall later be verified by the main construction contractor (see Section D6).</i></p>				
<p>B10.3 Performance requirements for CO₂e emissions from the transportation of aggregates (Same requirements for Core and Comprehensive criteria)</p> <p><i>This criterion should not be used where criterion B10.1 is applied. It is recommended to consider combining this criterion with B10.2 in order to achieve an overall environmental benefit. This should always be done based on an understanding of the local market conditions and by establishing and clearly specifying in the ITT a weighting of the two criteria that will ensure effective competition and reward bids that offer the best overall environmental performance.</i></p> <p>Points will be awarded in proportion to the reduction in the CO₂e emission/tonne of aggregates¹⁶ for use in the production of the main building elements listed in Table (e). The method and tool to be used to calculate the CO₂e emissions from the transportation shall be specified in the ITT. <i>In some Member States there may already be building permitting requirements and associated tools made available for the calculation of transport-related CO₂ equivalent emissions, in which case the bidders shall declare the emissions based on using these rules.</i></p> <p>A maximum target for CO₂e emissions/tonne aggregates transported could be set by the contracting authority based on information from the design team. This, together with their assumptions and rules, shall be included in the ITT for the main contractor.</p> <p><i>Table e. Scope of the building elements to be included</i></p> <table border="1" data-bbox="1141 392 1300 2056"> <thead> <tr> <th data-bbox="1141 1350 1173 2056">New-build</th> <th data-bbox="1141 392 1173 1350">Renovation</th> </tr> </thead> <tbody> <tr> <td data-bbox="1173 1350 1300 2056"> <ul style="list-style-type: none"> - The structural frame, including beams, columns and slabs - External walls, - Floors and ceilings - Internal walls - Roofs </td> <td data-bbox="1173 392 1300 1350"> <ul style="list-style-type: none"> - External walls - Internal walls - Re-roofing <p>Where additional floors or building extensions are foreseen that account for >25% of the existing useable floor area, the list of new-build elements shall also apply.</p> </td> </tr> </tbody> </table>		New-build	Renovation	<ul style="list-style-type: none"> - The structural frame, including beams, columns and slabs - External walls, - Floors and ceilings - Internal walls - Roofs 	<ul style="list-style-type: none"> - External walls - Internal walls - Re-roofing <p>Where additional floors or building extensions are foreseen that account for >25% of the existing useable floor area, the list of new-build elements shall also apply.</p>
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¹⁶ Aggregates can encompass: i) natural aggregates (such as sand, gravel, crushed rocks), ii) recycled aggregates (such as materials from Construction & Demolition Waste) and iii) secondary aggregates (such as slag and ashes from industrial processes)

– Foundations and substructure	
<p>Verification:</p> <p>The DB tenderer <i>or</i> the DBO tenderer shall provide an estimate of the CO₂e/tonne for aggregates that are used in the specified building elements using the calculation tool specified in the ITT. The transport mode(s) shall be specified and the emissions factor for each transport mode multiplied by the relevant quantities of materials as stated in the Bill of Quantities.</p>	

C. Strip-out, demolition and site preparation works	
Core criteria	Comprehensive criteria
TECHNICAL SPECIFICATIONS	
<p>C1. Demolition waste audit and management plan</p> <p>A minimum of 55% by weight of the non-hazardous waste generated during demolition and strip-out works, and excluding excavations and backfilling, shall be prepared for re-use, recycling and other forms of material recovery. This shall include:</p> <ul style="list-style-type: none"> (i) Timber, glass, metal, brick, stone, ceramic and concrete materials recovered from the main building structures; (ii) Fit-out and non-structural elements, to include doors and their frames, flooring, ceiling tiles, gypsum panels, plastic profiles, insulation materials window frames, window glass, bricks, concrete in the form of blocks and precast elements, steel rebars. <p>The contractor shall carry out a pre-demolition/strip-out audit in order to determine what can be re-used, recycled or recovered. This shall comprise:</p> <ul style="list-style-type: none"> (i) Identification and risk assessment of hazardous waste (including WEEE) that may require specialist handling and treatment, or emissions that may arise during demolition; (ii) A bill of quantities with a breakdown of different building materials and products, (iii) An estimate of the % re-use and recycling potential based on proposals for systems of separate collection during the demolition process, <p>The materials, products and elements identified shall be itemised in a Demolition Bill of Quantities.</p> <p>Verification:</p>	<p>C1. Demolition waste audit and management plan</p> <p>A minimum of 80% by weight of the non-hazardous waste generated during demolition and strip-out works, and excluding excavations and backfilling, shall be prepared for re-use, recycling. This shall include:</p> <ul style="list-style-type: none"> (i) Timber, glass, metal, brick, ceramics and concrete materials recovered from the main building structures, (ii) Fit-out and non-structural elements, to include doors and their frames, flooring, ceiling tiles, gypsum panels, plastic profiles, insulation materials window frames, window glass, bricks, concrete in the form of blocks and precast elements, steel rebars. <p>The contractor shall carry out a pre-demolition/strip-out audit in order to determine what can be re-used, recycled. This shall comprise:</p> <ul style="list-style-type: none"> (i) Identification and risk assessment of hazardous waste (including WEEE) that may require specialist handling or treatment, or emissions that may arise during demolition; (ii) A bill of quantities with a breakdown of the different constituent building materials and products, (iii) An estimate of the % re-use and recycling potential based on proposals for systems of separate collection during the demolition process, <p>The materials, products and elements identified shall be itemised in a Demolition Bill of Quantities.</p> <p>Verification:</p>

<p>The lead construction contractor, Design & Build contractor <i>or</i> DBO contractor shall submit a pre-demolition/strip-out audit that contains the specified information.</p> <p>A system shall be used to monitor and account for waste arisings. The destination of consignments of waste and end-of-waste materials shall be tracked using consignment notes and invoices. Monitoring data shall be provided to the contracting authority.</p>	<p>The lead construction contractor, Design & Build contractor <i>or</i> DBO contractor shall submit a pre-demolition/strip-out audit that contains the specified information.</p> <p>A system shall be used to monitor and account for waste arisings. The destination of consignments of waste and end-of-waste materials shall be tracked using consignment notes and invoices. Monitoring data shall be provided to the contracting authority.</p>
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D. Construction of the building or major renovation works

Core criteria

Comprehensive criteria

TECHNICAL SPECIFICATIONS

D1. Sourcing of legal timber by the lead construction contractor

(Same requirements for Core and Comprehensive criteria)

All timber or timber products¹⁷ to be supplied under the contract must be legally harvested in accordance with Regulation (EU) 995/2010 (the 'EU Timber Regulation').

This technical specification should be combined with the contract performance clause under D7.

Verification:

At the latest by the time of the award of the contract, the lead contractor shall provide information on:

- The operators or the traders (as defined in Regulation (EU) 995/2010) who will supply the timber and timber products used in the construction of the building;
- Evidence of the risk assessment and mitigation procedures put in place by the operator(s) first placing on the EU market the timber and timber products to be used in the construction of the building, in accordance with Article 6(1) (b) and (c) of Regulation (EU) 995 of 2010 as well as, where applicable, of the means whereby traders further down the supply chain ensure traceability, in accordance with Article 5 of Regulation (EU) 995 of 2010.

D2. Installation and commissioning of building energy systems

(Same requirements for Core and Comprehensive criteria)

Depending on the procurement route this may also apply to systems installed by a third party energy services contractor (see Section E).

The following systems shall be designed, installed and commissioned in conformance with the agreed designs and specifications:

- Heating, cooling and ventilation (HVAC)
- Low and Zero Carbon energy technologies
- Building Energy Management System (BEMS)
- Lighting controls

Each system shall be subjected to functional performance testing, including measurement of performance.

HVAC systems shall be in conformance with EN12599 or equivalent and, as relevant to other systems installed, other applicable EN, ISO or national standards, or their equivalent.

Verification:

The main construction contractor or the DBO contractor shall describe and commit to carrying out a functional performance testing routine in order to ensure that the systems perform within design parameters.

¹⁷ for timber and timber products within the remit of EU Timber Regulation

<p>D3. Site waste management</p> <p>Waste arisings during construction and renovation, and excluding demolition waste, shall be less than or equal to 11 tonnes per 100m² gross internal office floor area.</p> <p>A site waste management plan shall be prepared prior to the commencement of work on-site. The plan shall establish systems for the separate collection of materials on-site for re-use, recycling and other forms of recovery. The site waste management plan shall encompass:</p> <ul style="list-style-type: none"> (i) Construction products that form main building elements, including timber, glass, metal, brick, ceramics, concrete and inert waste, as well as associated packaging materials. (ii) Construction products that form part of the building fit-out, including flooring, ceiling tiles, plaster and gypsum panels, plastic profiles and insulation materials, as well as associated packaging materials. <p>Separate material collection for re-use, recycling and recovery shall respect the waste hierarchy in Directive 2008/98/EC.</p> <p>Verification:</p> <p>The lead construction contractor, Design & Build contractor <i>or</i> DBO contractor shall submit a site waste management plan consisting of:</p> <ul style="list-style-type: none"> (i) A bill of materials with estimates for waste arisings based on good practices, (ii) Estimates of the % re-use potential based on separate collection during the construction process, (iii) An estimation of the % recycling and recovery potential based on separate collection. <p>A system shall be used to monitor and account for waste arisings and to track the destination of consignments of waste. Monitoring data shall be provided to the contracting authority.</p>	<p>D3. Site waste management</p> <p>Waste arisings during construction and renovation, and excluding demolition waste, shall be less than or equal to 7 tonnes per 100m² gross internal office floor area.</p> <p>A site waste management plan shall be prepared prior to the commencement of work on-site. The plan shall identify opportunities for waste prevention and shall establish systems for the separate collection of materials on-site for re-use, recycling and other forms of recovery. The site waste management plan shall encompass:</p> <ul style="list-style-type: none"> (i) Construction products that form main building elements, including timber, glass, metal, brick, ceramics, concrete and inert waste, as well as associated packaging materials. (ii) Construction products that form part of the building fit-out, including flooring, ceiling tiles, plaster and gypsum panels, plastic profiles and insulation materials, as well as associated packaging materials. <p>Separate material collection for re-use, recycling and recovery shall respect the waste hierarchy in Directive 2008/98/EC.</p> <p>Verification:</p> <p>The lead construction contractor, Design & Build contractor <i>or</i> DBO contractor shall submit a site waste management plan consisting of:</p> <ul style="list-style-type: none"> (i) A bill of materials with estimates for waste arisings and the potential for waste prevention based on good practices, (ii) Estimates of the % re-use potential based on separate collection during the construction process, (iii) An estimation of the % recycling and recovery potential based on separate collection. <p>A system shall be used to monitor and account for waste arisings and to track the destination of consignments of waste. Monitoring data shall be provided to the contracting authority.</p>
<p>D4. Selection of fit-out materials and finishes</p> <p>Each material and finish selected for the fit-out of the offices shall comply with the following emissions limits in table e below. This requirement shall apply to:</p> <ul style="list-style-type: none"> - Ceiling tiles - Paints and varnishes - Textile floor and wall coverings - Laminate and flexible floor coverings 	<p>D4. Selection of fit-out materials and finishes</p> <p>Each material and finish selected for the fit-out of the offices shall comply with the following emissions limits in table f below. This requirement shall apply to:</p> <ul style="list-style-type: none"> - Ceiling tiles - Paints and varnishes - Textile floor and wall coverings - Laminate and flexible floor coverings

<p>- Wooden floor coverings</p> <p>All testing shall be on the as-finished product.</p> <p><i>Table f Materials and finishes emission limits</i></p> <table border="1"> <thead> <tr> <th rowspan="2">Product</th> <th colspan="2">Emissions limits (µg/m³)</th> </tr> <tr> <th>3 days</th> <th>28 days</th> </tr> </thead> <tbody> <tr> <td>TVOCs</td> <td>10,000</td> <td><2,000</td> </tr> <tr> <td>Formaldehyde</td> <td>-</td> <td><120</td> </tr> </tbody> </table> <p>Verification:</p> <p>The main construction contractor or the DBO contractor shall provide compliant test results for each material or finish installed. The determination of emissions shall be in conformance with CEN/TS 16516, or equivalent product testing standards or labels which use the European 'reference room' as the basis for testing.</p>	Product	Emissions limits (µg/m³)		3 days	28 days	TVOCs	10,000	<2,000	Formaldehyde	-	<120	<p>- Wooden floor coverings</p> <p>All testing shall be on the as-finished product.</p> <p><i>Table g. Material and finishes emission limits</i></p> <table border="1"> <thead> <tr> <th rowspan="2">Product</th> <th colspan="2">Emissions limits (µg/m³)</th> </tr> <tr> <th>3 days</th> <th>28 days</th> </tr> </thead> <tbody> <tr> <td>TVOCs</td> <td>10,000</td> <td><1,000</td> </tr> <tr> <td>SVOCs</td> <td>-</td> <td>100</td> </tr> <tr> <td>Formaldehyde</td> <td>-</td> <td><40</td> </tr> <tr> <td>Carcinogens - trichloroethylene, - benzene - DEHP - DBP</td> <td><10 sum total of the four substances</td> <td><1 for each substance</td> </tr> </tbody> </table> <p>Verification:</p> <p>The main construction contractor or the DBO contractor shall provide compliant test results for each material or finish installed. The determination of emissions shall be in conformance with CEN/TS 16516, or equivalent product testing standards or labels which use the European 'reference room' as the basis for testing.</p>	Product	Emissions limits (µg/m³)		3 days	28 days	TVOCs	10,000	<1,000	SVOCs	-	100	Formaldehyde	-	<40	Carcinogens - trichloroethylene, - benzene - DEHP - DBP	<10 sum total of the four substances	<1 for each substance
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<p>D5. Installation and commissioning of building energy systems <i>(Same requirements for Core and Comprehensive criteria)</i> <i>Depending on the procurement route, this may also apply to systems installed by a third party energy services contractor (see Section E).</i></p> <p>The following systems shall be installed and commissioned in conformance with the agreed designs and specifications:</p> <ul style="list-style-type: none"> - Heating, cooling and ventilation (HVAC) - Low and Zero Carbon energy technologies - Building Energy Management System (BEMS) - Lighting controls <p>Each system shall be subjected to functional performance testing as described in the successful tender, including measurement of performance.</p>																													

<p>The main construction contractor or the DBO contractor shall provide a copy of the survey report or certificate confirming that testing of the building services has been carried out and providing data showing that the services perform within design parameters.</p>
<p>D6. Incorporation of recycled content <i>(Same requirements for Core and Comprehensive criteria)</i> As materials are ordered and brought onto site, recycled content claims shall be verified for each batch of product¹⁸. The main construction contractor or the DBO contractor shall verify claims by obtaining information from supplier(s) of the construction products used. This shall include mass balance calculations supported by batch testing results, delivery documentation and/or factory production control documentation. In each the data shall be verified by a third party audit.</p>
<p>D7. Sourcing of legal timber <i>(Same requirements for Core and Comprehensive criteria. When possible it is recommended that spot checks be carried out in cooperation with the competent authority responsible for implementation of Regulation (EU) 995/2010)</i> The contracting authority is entitled to carry out spot checks regarding compliance with Technical Specification DI for all or a specified sub-set of the timber products used under the contract. Upon request, the contractor should provide evidence to demonstrate compliance with the EU Timber Regulation: In most cases – where the contractor is not the company first placing timber or timber products on the EU market but obtains such products from others (defined as a ‘trader’¹⁹ in Regulation 995/2010), the contractor should provide the following information in respect of timber or timber products to be verified during the spot check:</p> <ul style="list-style-type: none"> - The operators or the traders who have supplied the timber and timber products used in construction of the building; - Documents or other information indicating compliance of those timber products with the applicable legislation; - Evidence of the risk assessment and mitigation procedures put in place in accordance with Article 6(1) (b) and (c) of Regulation (EU) 995 of 2010. <p>In cases where the contractor places timber or timber products for the first time on the EU market for use in the construction project (defined as an ‘operator’²⁰ in Regulation 995/2010), the contractor should provide the following information in respect of timber or timber products covered by the spot check:</p> <ul style="list-style-type: none"> - A description of each type of timber used, including the trade name, type of product, the common name of tree species and, where applicable, its full scientific name; - Name and address of the supplier of the timber and timber products; - The country of harvest, and where applicable²¹: <ul style="list-style-type: none"> (i) Sub-national region where the timber was harvested; (ii) Concession of harvest; (iii) Quantity (expressed in volume, weight or number of units);

¹⁸ 'batch' means a quantity of uniformly labelled product manufactured by the same mixing plant, under the same conditions according to a set mix design with the same input materials.

¹⁹ 'trader' means any natural or legal person who, in the course of a commercial activity, sells or buys on the internal market timber or timber products already placed on the internal market

²⁰ 'operator' means any natural or legal person that places timber or timber products on the market;

²¹ for more information, see: <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32012R0607&from=>

<ul style="list-style-type: none"> - Documents or other information indicating compliance of those timber products with the applicable legislation; - Evidence of the risk assessment and mitigation procedures put in place in accordance with Article 6(1) (b) and (c) of Regulation (EU) 995 of 2010. This may include certification or other third party verified schemes. <p>Timber covered by valid EU FLEGT or CITES licenses shall be considered to have been legally harvested according to Regulation (EU) No 995/2010.</p>	<p>Background note: Sustainable Sourcing of Timber</p> <p><i>These GPP criteria do not include a proposal on the sourcing of timber from sustainable forestry, for the following reasons:</i></p> <p>Several Member States are using their own GPP/SPP criteria to define sustainable management of forests and have different processes in place to determine whether certification schemes provide sufficient assurance. In this situation, it was not possible, within the framework of this criteria development process, to provide a harmonised definition of sustainable managed forestry.</p> <p>The current consensus of the above-mentioned Member States is that, in general, FSC and PEFC provide sufficient levels of assurance for compliance with their national criteria. Although 100% certified sustainable wood is desirable, it could be difficult to achieve due to possible fluctuations in market demand, particularly for SMEs that are accustomed to working with a limited number of suppliers. Instead, a minimum of 25% sustainable wood should be easily achievable while more ambitious public authorities could set a minimum requirement of 70%, with a recommendation to seek feedback from the market prior to publishing the ITT.</p>	<p>D8. Site waste management</p> <p><i>(Same requirements for Core and Comprehensive criteria)</i></p> <p>Operation of the agreed site waste management plan shall be monitored and reported on during progress of construction work on-site. This shall include data accounting for the weight of materials collected by the separate collection of materials on-site for re-use and recycling according to the scope described in the technical specifications.</p> <p>A system shall be used to monitor and quantify waste arisings and materials segregated for recycling and re-use. It shall also track and verify the destination of consignments of waste. The monitoring and tracking data shall be provided to the contracting authority on an agreed periodic basis.</p> <p><i>Note to contracting authorities on the legal sourcing of timber:</i></p> <p>Suitable remedies should be provided under the contract for cases of non-compliance with the above clause. Advice on the application of these requirements, and the monitoring organisations able to verify compliance, may be obtained from the competent national authorities listed at: http://ec.europa.eu/environment/forests/pdf/list_competent_authorities_eur.pdf</p>
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E. Installation of energy systems and the supply of energy services

Core criteria	Comprehensive criteria
<p>TECHNICAL SPECIFICATIONS</p> <p>E1. Heating systems, including Combined Heat and Power (CHP)</p> <p>All heating systems, including those supplied by CHP units, that supply heat to either water or air based heating distribution systems for an office building shall meet the relevant Core GPP criteria that demonstrate the efficiency of each technology :</p> <ul style="list-style-type: none"> - For water-based heaters, which covers boilers and heat pumps up to 400 kW heat output and for combined heat and power units with an electricity generating capacity of less than or equal to 50 kW_e: technical specifications 3.1 and 3.2 shall be met. The criteria can be accessed here: http://ec.europa.eu/environment/gpp/pdf/criteria/water_based/heaters_en.pdf - For combined heat and power, which covers prime movers with an electricity generating capacity greater than 50 kW_e: technical specification 3.1.1, which specifies a minimum 75% annual overall efficiency and 3.2.2, which specifies requirements for 'high efficiency' cogeneration, shall be met. The criteria can be accessed here: http://ec.europa.eu/environment/gpp/pdf/chp_GPP_product_sheet.pdf <p>Verification:</p> <p>Tenderers shall provide technical performance data for the products proposed to be installed demonstrating how they will comply with the appropriate GPP criteria.</p>	<p>E1. Heating systems, including Combined Heat and Power (CHP)</p> <p>All heating systems, including those supplied by CHP units, that supply heat to either water or air based heating distribution systems for an office building shall meet the relevant Comprehensive GPP criteria that demonstrate the efficiency of each technology:</p> <ul style="list-style-type: none"> - For water-based heaters, which covers boilers and heat pumps up to 400 kW heat output and for combined heat and power units with an electricity generating capacity of less than or equal to 50 kW_e: technical specifications 3.1 and 3.2 shall be met. The criteria can be accessed here: http://ec.europa.eu/environment/gpp/pdf/criteria/water_based/heaters_en.pdf - For combined heat and power, which covers prime movers with an electricity generating capacity of greater than 50 kW_e: technical specification 3.2.1 which specifies a minimum 75% annual overall efficiency and 3.2.2 which specifies requirements for 'high efficiency' cogeneration shall be met. The criteria can be accessed here: http://ec.europa.eu/environment/gpp/pdf/chp_GPP_product_sheet.pdf <p>Verification:</p> <p>Tenderers shall provide technical performance data for the products proposed to be installed demonstrating how they will comply with the appropriate GPP criteria.</p>

F. Completion and handover

Core criteria	Comprehensive criteria
TECHNICAL SPECIFICATIONS	
<p>F1. Quality of the completed building fabric</p> <p>The building fabric and its construction shall be designed in order to ensure a high standard of air tightness. The design air tightness shall be 4 m³/(h.m²) at 50 Pascals for new-build and 8 m³/(h.m²) at 50 Pascals for major renovations.</p> <p>Upon completion of the building, the lead contractor shall test the quality of the finished building fabric and its construction according to EN 13829 or equivalent in order to ensure that the design performance has been achieved.</p> <p>Verification:</p> <p>The tenderer shall provide a commitment to carry out, upon completion, testing of the airtightness of the building fabric and to address any defects that may arise.</p>	<p>F1. Quality of the completed building fabric</p> <p>The building fabric and its construction shall be designed in order to ensure continuity of insulation and a high standard of air tightness. The design air tightness shall be 2 m³/(h.m²) at 50 Pascals for new-build and 5 m³/(h.m²) at 50 Pascals for major renovations.</p> <p>Upon completion of the building, the lead contractor shall test and evaluate the quality of the finished building fabric and its construction according to EN13187 and EN 13829 or equivalent in order to ensure that there are no defects and that the design performance has been achieved.</p> <p>Verification:</p> <p>The tenderer shall provide a commitment to carry out, upon completion, testing of the thermal integrity and airtightness of the building fabric and to address any defects that may arise.</p>
AWARD CRITERIA	
<p>F2. Installation and commission of low or zero carbon energy sources</p> <p><i>(Same requirements for Core and Comprehensive criteria)</i></p> <p>Additional points shall be awarded to tenderers that provide aftercare service over and above minimum warranty requirements to ensure that systems function correctly.</p> <p>Verification:</p> <p>The main construction contractor or the DBO contractor shall outline the extent of the aftercare services expressed in terms of staff time and technical scope.</p>	
CONTRACT PERFORMANCE CLAUSES	
<p>F3. Quality of the completed building fabric</p> <p>The lead contractor shall test the quality of the finished building fabric and its construction to ensure that they meet the design specifications for air tightness. Where defects are identified, remedies shall be proposed.</p> <p>A fan pressurisation test shall be carried out for at least 20% of the buildings useable internal floor space demonstrating that the design air tightness is 4 m³/(h.m²) at 50 Pascals for new-build and 8 m³/(h.m²) at 50 Pascals for major renovations.</p> <p>The test shall be carried out in accordance with EN 13829 or equivalent standards accepted by the respective building control body where the building is located.</p> <p>The testing shall be carried out following practical completion of the building. The contractor</p>	<p>F3. Quality of the completed building fabric</p> <p>The lead contractor shall test and evaluate the quality of the finished building fabric and its construction to ensure that they meet the design specifications for airtightness and continuity of insulation. Where defects are identified then remedies shall be proposed.</p> <p>This shall take the form of a thermal imaging evaluation carried out in accordance with EN 13187 and a fan pressurisation test for at least 20% of the buildings useable internal floor space demonstrating that the design air tightness is 2 m³/(h.m²) at 50 Pascals for new-build and 5 m³/(h.m²) at 50 Pascals for major renovations.</p> <p>The blower door test shall be carried out in accordance with EN 13829 or equivalent standards accepted by the respective building control body where the building is located.</p>

<p>shall provide a copy of the survey report or certificate confirming that the building meets the air tightness requirement following a test carried out according to EN 13829 or equivalent.</p>	<p>The testing shall be carried out following practical completion of the building. The contractor shall provide a copy of the survey report or certificate confirming that the building meets the air tightness requirement following a test carried out according to EN 13829 or equivalent.</p> <p>There are no significant defects or irregularities in the construction details in accordance with EN 13187 or equivalent.</p>
<p>F4. Lighting control systems <i>(Same requirements for Core and Comprehensive criteria)</i></p> <p>Systems shall be commissioned in accordance with contract performance clause 3.3.1 from the same criterion. The main contractor shall provide an operational manual for the systems in line with GPP indoor lighting design (technical specification) criterion 3.3.1.</p> <p>Training shall be provided to either the occupants and (<i>where relevant</i>) the appointed facilities management provider on how to use the systems. The interface with the BEMS (criterion F2) shall also be addressed.</p> <p>The Design team or the Design & Build contractor or the DBO contractor shall provide a copy of the survey report or certificate confirming that testing of the lighting systems has been carried out and providing data showing that the systems perform to within design parameters. They shall additionally confirm that the required materials and training have been provided.</p>	
<p>F5. Building energy management system <i>(Same requirements for Core and Comprehensive criteria)</i></p> <p>The BEMS shall be commissioned in accordance with the required technical specifications. The main contractor shall provide an operational manual for the Building Energy Management System (BEMS). Training shall be provided to either the occupants and (<i>where relevant</i>) the appointed facilities management provider on how to use the BEMS. This shall include use of the user interface to analyse and download energy data using accessible software tools.</p> <p>The main construction contractor or the DBO contractor shall provide:</p> <ul style="list-style-type: none"> - A copy of the survey report or certificate confirming that testing of the BEMS has been carried out, - Data showing that the systems perform within design parameters, - Confirmation that the required materials and training have been provided. 	
<p>F6. Installation and commissioning of low or zero carbon energy sources <i>(Same requirements for Core and Comprehensive criteria)</i></p> <p>The low or zero carbon energy systems shall be commissioned in accordance with the required technical specifications.</p> <p>The main construction contractor or the DBO contractor shall provide a copy of the survey report or certificate confirming that testing of the energy systems has been carried out and providing data showing that the systems perform within design parameters.</p>	

F7. Recyclable waste storage

(Same requirements for Core and Comprehensive criteria)

Upon completion it shall be confirmed that dedicated storage space has been provided within the building, or within the curtilage of the building, to facilitate the segregation of recyclable materials and end-of-life products by occupiers (with reference to the requirements in criterion B6).

The construction contractor, the Design & Build contractor or the DBO contractor shall provide final detailed plans of the recycling facilities as-built.

F8. Air quality testing

The lead contractor shall test the air quality within the building no more than four weeks following completion of the building fit-out with the materials and finishes in Criterion D5 and prior to occupation.

Testing shall be carried out for each distinct room configuration in the building that accounts for > 10% of the office space. Two sample rooms with different façade aspects shall be tested per room configuration.

The test results for each room specification tested in the building shall conform with the requirements in table g.

Table h. Parameters for office air quality testing

<i>Substance(s) to be tested</i>	<i>Testing parameters</i>
Total Volatile Organic Compounds (TVOC's)	<500 μm^3 (eight hour average) in accordance with ISO 16017-2 or equivalent
Formaldehyde	<100 μm^3 (30 minutes average) in accordance with ISO 16000-3 or equivalent
Particulates	An eight hour average for two particle sizes in accordance with ISO 7708 or equivalent: PM10: 50 μm^3 PM2.5: 15 μm^3

The lead construction contractor or the DBO contractor shall carry out testing and provide test results demonstrating compliance with the required parameters. All measurements shall be taken during normal occupied hours and under design ventilation conditions in which the systems have been running for at least 12-24 hours prior to testing.

G. Facilities management

Core criteria	Comprehensive criteria
TECHNICAL SPECIFICATIONS	
<p>G1. Building energy management system</p> <p>The facilities manager shall produce monthly reports for the occupier using data from the Building Energy Management System (BEMS). The arrangement shall be subject to a review on an annual basis. The reports shall disaggregate heating, cooling, ventilation and lighting energy use on a seasonal basis.</p> <p>Verification:</p> <p>Potential facilities management contractors or DBO contractors shall submit their proposed format for the reports as part of their ITT response.</p>	<p>G1. Building energy management system</p> <p>The facilities manager shall produce monthly reports for the occupier using data from the Building Energy Management System (BEMS). The arrangement shall be subject to a review on an annual basis.</p> <p>The reports shall identify trends in energy use within the building, disaggregated so that heating, cooling and lighting can be identified on a seasonal basis as well as by zone or department. The reports shall include recommendations on remedial action and/or further energy savings that could be made.</p> <p>Verification:</p> <p>Potential facilities management contractors or DBO contractors shall submit their proposed format for the reports as part of their ITT response.</p>
<p>G2. Energy performance contract</p> <p><i>(Same requirements for Core and Comprehensive criteria)</i></p> <p>The building operator or facilities manager (as appropriate) shall agree, based on the preliminary modelling of the buildings energy consumption (see criterion A1), limits on energy consumption associated with lighting, heating, cooling, ventilation and auxiliary power. This shall exclude predicted loads relating to the users such as servers and small power loads.</p> <p>The contract shall be based on a minimum of ten years averaged weather and degree days data for the location. The contract shall also define adjustments to account for possible future variations in occupancy, extreme weather events and market energy costs.</p> <p>If energy usage were to exceed these limits, the building operator or facilities manager (as appropriate) would be liable for the additional costs. If energy usage were to be below these limits, the savings would be shared 50:50 (or an alternative agreed apportionment of the savings) with the contracting authority. The arrangement shall be subject to a review on an annual basis.</p> <p>Verification:</p> <p>The building operator or facilities manager shall make a contractual commitment to the agreed arrangement, including the scope and energy limits. A process for independent collation and presentation of the annual data shall be provided.</p>	<p>G2. Energy performance contract</p> <p><i>(Same requirements for Core and Comprehensive criteria)</i></p> <p>The building operator or facilities manager (as appropriate) shall agree, based on the preliminary modelling of the buildings energy consumption (see criterion A1), limits on energy consumption associated with lighting, heating, cooling, ventilation and auxiliary power. This shall exclude predicted loads relating to the users such as servers and small power loads.</p> <p>The contract shall be based on a minimum of ten years averaged weather and degree days data for the location. The contract shall also define adjustments to account for possible future variations in occupancy, extreme weather events and market energy costs.</p> <p>If energy usage were to exceed these limits, the building operator or facilities manager (as appropriate) would be liable for the additional costs. If energy usage were to be below these limits, the savings would be shared 50:50 (or an alternative agreed apportionment of the savings) with the contracting authority. The arrangement shall be subject to a review on an annual basis.</p> <p>Verification:</p> <p>The building operator or facilities manager shall make a contractual commitment to the agreed arrangement, including the scope and energy limits. A process for independent collation and presentation of the annual data shall be provided.</p>

<p>G3. Waste management system</p> <p>The building manager shall implement systems that allow occupiers to segregate paper, cardboard, food and drink packaging (glass, plastic and other materials for which local separate collection systems exist) into separate streams for recycling. Batteries, ink and toner cartridges, IT equipment and furniture shall also be collected and arranged for re-use or recycling where possible.</p> <p>Verification:</p> <p>Facilities managers <i>or</i> DBO contractors shall submit a proposal for the systems to be used, including details of the waste streams, the segregation systems, working arrangements and contractors to be used.</p>	<p>G3. Waste management system</p> <p>The building manager shall implement systems that allow occupiers and on-site catering services to segregate paper (at least two grades), cardboard, food and drink packaging (glass, plastic and other materials for which local separate collection systems exist) and food/catering waste into separate streams for recycling. Batteries, ink and toner cartridges, IT equipment and furniture shall also be collected and arranged for re-use or recycling where possible.</p> <p>Verification:</p> <p>Facilities managers <i>or</i> DBO contractors shall submit a proposal for the systems to be used, including details of the waste streams, the segregation systems, working arrangements and contractors to be used.</p>
<p>CONTRACT PERFORMANCE CLAUSE</p>	
<p>G4. Energy performance contract <i>(Same requirements for Core and Comprehensive criteria)</i></p> <p>Energy data shall be independently collated so that the energy performance of the building can be monitored on an annual basis against the agreed energy consumption limits. The building operator or facilities manager shall arrange for the third party collation of data from utility bills/meters and the Building Energy Management System.</p> <p>This data shall be reviewed annually by both the operator and the contracting authority in order to determine the building energy consumption and the monthly profit/loss for the operator and public authority.</p>	
<p>G5. Waste management system <i>(Same requirements for Core and Comprehensive criteria)</i></p> <p>The building manager shall monitor and quantify on an ongoing agreed basis the overall waste arisings and recycling rate for the building(s). Facilities managers <i>or</i> DBO contractors shall provide the contracting authority with monthly data quantifying waste arisings as a proportion of the overall waste arisings from the building and in kg per waste fraction.</p>	

3 LIFE CYCLE COSTING

Life Cycle Costing (LCC) considerations have informed development of the Office Building EU GPP criteria. LCC can be used to assess the total cost of ownership of an office building over its design or service life. In particular it enables '*comparative cost assessments to be made over a specified period of time, taking into account all relevant economic factors both in terms of initial capital costs and future operational and asset replacement cost*'²².

3.1 The rationale and scope for considering life cycle costs

LCC is particularly relevant to achieving an improved environmental performance because higher initial capital costs may be required to achieve lower life-cycle running costs, higher residual property values and improved workforce productivity. It therefore represents a method for making effective, long-term investment decisions. It has been estimated that between 80% and 90% of the running costs of a building are determined at the design stage. Of these costs, indicative cost-optimal utility savings of up to 35% for new buildings and up to 30% for renovations at a comprehensive ambition level are realistic if good design is procured. If staff costs are included in an LCC, then even greater savings can be achieved, with a 1% saving having a comparable value to approximately half of a typical office's utility costs.

Consequently, LCC is an important tool during the project definition, concept design and detailed design stages, where it can be used to select and value engineer the design that will provide the lowest overall cost (and highest residual value) along the life cycle of the asset. A simplified 'cost-optimal' LCC methodology was introduced by the recast Energy Performance of Buildings Directive (EPBD) and is referred to in the EU GPP energy criteria. A full LCC exercise may be carried out with reference to the ISO standard 15685-5 or equivalent.

3.2 How the GPP criteria can reduce life cycle costs

The EU GPP criteria for office buildings will have a positive influence on some of the key factors influencing the overall life cycle costs of a building. These are briefly highlighted below, with reference to the main LCC cost variables, noting that the potential benefits will always depend on the specific characteristics of each project (e.g. location, climatic conditions, local availability, construction practices):

- *Acquisition (indicatively 20% of life cycle costs):*
 - The Selection Criteria can be used to procure skilled and experienced project managers, design teams, cost consultants and contractors, which will tend to reduce the risk of cost overruns and improve outcomes on innovative projects.
 - The potential to contract 'energy services' in order to minimise the upfront acquisition costs for new, more efficient energy technologies, or even building fabric improvements, is supported by a number of criteria. Public authorities may indicatively save up to 30% on building fabric improvements (e.g. insulation, windows) and up to 80% on energy technologies (e.g. CHP, biomass heating).
 - The accompanying GPP guidance highlights how cost savings can be identified through early options appraisal, for example through comparing the cost of renovation and new-build. Public authorities may indicatively save 10-40% by renovating existing buildings.
 - The criteria on resource-efficient construction encourage a reduction in waste from construction sites, a reduction in transport costs for major structural materials (e.g. concrete) and the re-use of structural elements, all of which may contribute to reduced build costs.

- *Operation, maintenance and replacement (indicatively 75% of life cycle costs):*

²² Davis Langdon, *Life cycle costing (LCC) as a contribution to sustainable construction: a common methodology*, Literature review prepared for the European Commission, May 2007

- The energy and water performance criteria seek to reduce utility costs to a cost-optimal level, recognising that utilities account for the majority of a buildings operational costs. Indicative, modelled savings in heating, cooling, lighting and ventilation in the range of 53-74% for new offices and 25-53% for refurbished offices are estimated, taking into account climatic variations across the EU.
 - Criteria also address the quality of construction, to ensure that design performance is achieved, as well as the correct installation and commissioning of Heating, Ventilation and Air Conditioning (HVAC) systems and renewable energy technologies to ensure they perform to design specifications. Evidence suggests that problems can lead to, on average, up to 30% higher energy use.
 - The monitoring of energy use in a building is an important factor in optimising efficiency and identifying areas for further potential future savings. Building Energy Management (BEMS) and the management of other systems such as lighting provide tools to do this and are addressed by specific criteria. Evidence suggests that such systems can support energy savings of between 15-30%.
 - A criterion on cost and benefit sharing for Design, Build and Operate (DBO) projects, energy services providers and facilities management providers can be used to incentivise contractors to minimise long-term operating costs, including energy, water and waste management costs, to the benefit of both parties.
 - The criteria include the option to carry out a Life Cycle Assessment (LCA) of a building, which allows for the modelling and optimisation of the lifespan of the building as a whole and for individual elements based on estimates of replacement costs and expected useful lifespans.
- *Residual Value:*
 - Implementation of the GPP criteria set will demonstrate that the building has an improved environmental performance, which, because it reduces running costs and demonstrates responsible investment, may in turn contribute to sustaining or improving its future value in the property market. Annual depreciation may be improved from an indicative market average of 0.8%.
 - Criteria on the design, commissioning, monitoring and ongoing management of building services will tend to extend the lifespan of technologies and systems.
 - Criteria on the preparation of demolition waste audits and management plans have been demonstrated to reduce waste disposal costs and to recover value from the demolition of a building²³.
 - The accompanying GPP guidance highlights the potential benefits of designing for future adaptability, which can further help to sustain healthy future property values.

The criteria also take into account intangible benefits, which influence the users' comfort, amenity and efficiency. For example, evidence shows that healthy buildings can contribute to a more productive workforce and reduce lost time through sick leave, although quantifying these benefits is challenging²⁴. The human aspect of buildings is very important given that salaries generally represent a significantly higher cost than building operational costs such as energy or water, accounting for over 90% of life cycle costs if included within calculations.

- As a result, the GPP criteria include 'environmental quality' criteria on daylighting, indoor air quality and thermal comfort, all of which are factors for which there is evidence that they contribute strongly to occupier wellbeing and productivity. For example, evidence suggests that poor thermal comfort can reduce productivity by 4-6%, whereas good indoor air quality can lead to increases in productivity by 8-11%. Good daylighting has been shown to improve sleep patterns and alertness.

²³ The cost of demolition is notionally estimated as representing 5% of the life cycle costs.

²⁴ World Green Building Council (2014) *Health, wellbeing & productivity in office – the next chapter for green buildings*.

TECHNICAL ANNEXES

Annex 1

Supporting guidance for criterion B10.1: Aggregation of EPDs

In detailed design and performance award Criteria B10.1 it was described how Environmental Product Declarations (EPDs) could be used by bidders in order to demonstrate how they would reduce the environmental impact of the construction of an office building. 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.

The need for conformity of EPDs with ISO 14025 or EN 15804 is also highlighted. However, additional normalisation and weighting rules within existing building assessment and certification schemes may be used to evaluate designs.

1.1 When can the EPD option be used?

The use of criteria B10.1 is only recommended where a comparison can be made against a reference building design and/or between different building designs. It is therefore relevant to the following procurement scenarios:

- Where the client already has a reference building 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 building designs to be brought forward by design teams and/or contractors;
- Where building designs are required to demonstrate a defined level of environmental performance for specific building elements following rules with an existing building assessment and certification scheme.

In these scenarios, the aggregation of EPDs as the basis for evaluation of performance can be made an award requirement.

1.2 Conformity of the EPDs used

EPDs shall be compiled for the listed building elements. These EPDs shall all have been selected from within the same Product Category Rules (PCRs). All EPDs shall be in conformance with ISO 14025 or EN 15804.

New primary data for building elements may be used to supplement these EPDs but shall be subject to LCA analysis according to the same PCRs.

Some existing building assessment and certification schemes apply normalisation and/or weighting rules to EPD results in order to generate a comparative score or rating. As long as the main PCR rules are in compliance with ISO 14025 or EN 15804, these comparative scores or ratings may be used and each design shall be evaluated according to the system used with the same scheme.

1.3 Will additional expertise be required to evaluate bids?

In any bidding process for office buildings, 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 expert input at two main stages:

1. 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. Evaluating designs and improvement options: A technical evaluation of bidders responses to this criteria should be carried out in order to support the procurer.

1.4 What instructions should be given to bidders?

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

Technical instructions for bidders using EPDs for building evaluations

Technical point to address	What this means in practice
a. Comparability of EPDs	<p>The EPDs shall be selected from within the same Product Category Rules (PCRs). The PCR scheme shall therefore be specified in the ITT.</p> <p>Where the normalisation and/or weighting rules of an EPD system linked to an existing building certification scheme are to be used, each design shall be evaluated according to the same scheme and rules.</p> <p>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 building elements identified from the analysis (see tables a and b in criterion B10.1).</p>
b. Comparison on the basis of functional equivalence	<p>The declared unit, service life and assumptions relating to replacement lifespans shall be those defined within the PCR for the product or building element (see ISO 14025 or EN 15804). A common declared unit shall be used to present the results.</p>
c. Building elements within the scope of the criteria	<p>The scope of the criteria shall, as a minimum, comprise the following building elements:</p> <ul style="list-style-type: none"> - Foundations and substructures - The structural frame, including beams, columns and slabs - External walls and insulation - Floors and ceilings - Internal walls - Windows - Roofs
d. Definition of the building's life cycle and boundaries	<p>EPDs that address cradle to grave shall be compiled. These EPD shall also consider the end of life recycling loads and benefits.</p> <p>Allocation for recycled or re-used materials shall be made according to the following rules:</p> <ul style="list-style-type: none"> - 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.
e. Relevance of the results to the whole building	<p>The declared unit for each EPD shall be multiplied by the appropriate quantity in the bill of materials. This is to ensure that the total environmental impact for each building design can be compared.</p>
f. Lifecycle impact category indicators to be used for evaluation purposes	<p>As a minimum, the impact category indicators (referred to as parameters) indicated in EN 15804 shall be used:</p> <ul style="list-style-type: none"> - 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) <p>Other parameters describing resource use, waste and output flows identified by the EN 15804 can also be, partially or fully, included if they are not already covered within other GPP criteria that are specified, e.g.</p>

	<p>recycled content, renewable energy generation.</p> <p>A weighting system for the selected impact category indicators shall be applied to evaluate the overall results from the EPD indicators or ratings for the building elements. This system shall be selected by the contracting authority on the basis of:</p> <ul style="list-style-type: none"> - A suitable existing weighting system giving a rating, such as those adopted in some verified PCR schemes, - A weighting system proposed by the LCA technical evaluator (see Annex 3). <p>Where an LCA tool generates an aggregated score for the Office Building, only the result for these impact categories shall be taken into account.</p>
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Annex 2

Supporting guidance for criterion B10.1: Carrying out an LCA analysis

In detailed design and performance requirement award Criterion B10.1 it was described how Life Cycle Assessment (LCA) could be used by bidders in order to demonstrate how they have reduced the environmental impact of an office building's 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 LCA shall be carried out with reference to ISO 14040/ISO 14044 or EN 15978.

2.1 When can the LCA option be used?

The use of criteria 10b is only recommended where a comparison can be made of improvement options against a reference building design and/or between different building designs. It is therefore relevant to the following procurement scenarios:

- Where the client already has a reference building 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 building designs to be brought forward by design teams and/or contractors:
- Where building designs are required to demonstrate a defined level of performance for specific building components using an LCA-based calculation tool:

In these scenarios an LCA analysis can be made an award requirement.

2.2 Will additional expertise be required to evaluate bids?

In any tender process for office buildings 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 3.

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 building, this shall be clearly stated and the bill of materials provided.

Technical instructions for bidders using LCA for building evaluations

Technical point to address	What this means in practice
a. Method and inventory data	<p>The impact assessment method and life cycle inventory (LCI) data to be used by each design team shall, be specified to ensure comparability.</p> <p>Verified primary data may be used to supplement gaps following the</p>

	<p>guidance in ISO 14040/14044 or EN 15978, and for data from EPDs ISO 14025 or EN 15804.</p> <p>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 building elements identified from the analysis (see tables a and b in criterion B10.1).</p>
b. Comparison on the basis of functional equivalence	<p>The following characteristics of the building shall be specified as a reference point for each design (see ISO 14040/14044 or EN 15978):</p> <ul style="list-style-type: none"> - Relevant technical and function requirements, as described in the performance requirements; - The envisaged pattern of use; - The requested service life. <p>A common functional unit or reference unit shall then be used to present the results (see ISO 14044 or EN 15978). Service lifetime shall be considered in the definition of the functional unit.</p>
c. Definition of the buildings life cycle and boundaries	<p>The boundary for the analysis shall be cradle-to-grave (see ISO 14040).</p> <p>In the case of a building refurbishment, design teams shall indicatively refer to Module B5 of EN 15978 'boundary for refurbishment'.</p> <p>Allocation for recycled or re-used materials shall be made according to the following rules:</p> <ul style="list-style-type: none"> - 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. Building elements within the scope of the criteria	<p>The scope of the criteria shall, as a minimum, comprise the following building elements:</p> <ul style="list-style-type: none"> - Foundations and substructures - The structural frame, including beams, columns and slabs - External walls and insulation - Floors and ceilings - Internal walls - Windows - Roofs
e. Lifecycle category indicators to be used for evaluation purposes	<p>As a minimum, the impact category indicators indicated in EN 15978 shall be used:</p> <ul style="list-style-type: none"> - 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) <p>Other indicators describing resource use, waste and output flows identified by the EN 15978 can also be, partially or fully, included if they are not already covered within other GPP criteria that are specified, e.g. recycled</p>

	<p>content, renewable energy generation.</p> <p>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:</p> <ul style="list-style-type: none"> - 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 3). <p>Where an LCA tool generates an aggregated scoring for the Office Building, only the result for the impact categories identified in EN 15978, or those shall be taken into account.</p>
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Annex 3

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 1 or 2, depending on the option chosen.

The technical evaluator shall propose and agree with the contracting authority the weighting of the LCIA indicator results, unless this is already predetermined by options ii or iii in Criterion 10B.1

Once tenders have been received the technical evaluator will either:

- (i) Carry out a check for how EPDs have been aggregated, 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, 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).