ADDENDUM TO THE REGULATION

APPENDIX B:

Guidance to the Finalist Teams to Design a Low Carbon, Sustainable and Resilient Project

Contents

Guidance for meeting the 10 challenges

Introduction:

This guidance document summarizes each of the 10 challenges and provides questions for bidder teams to consider within their proposals for the site. The lists of questions and examples provided in this document are not exhaustive – bidder teams are encouraged to propose new and innovative methods for addressing the challenges where appropriate. Bidder teams are not required to answer every question set out in this document, instead they are encouraged to use the questions as a guide for their overall response.

Responding to the challenges: "Challenge 1: Site energy efficiency and supply of clean energy" is the only mandatory challenge of the competition. The bidder teams are invited to *consider* all challenges within their proposals. However, it is important for bidder teams to focus on the challenges that are most appropriate for the site i.e. emphasize those which will enable the city and the local communities to catalyze change towards decarbonized, sustainable and resilient urban development. Bidder teams will be expected to justify their prioritization of the challenges and to provide details on how they will address each of the challenges that they have selected.

Local regulations and sustainability standards: Bidder teams should ensure that their proposed approaches to addressing the challenges comply with local and national building and environmental regulations, policies and standards. Where applicable, bidder teams may demonstrate how the use of approved national or international sustainability standards from design to completion will allow the project to address the relevant challenges, for example: LEED, BREEAM, Estidama, EDGE, QualiVerde, Référentiel E+,C-, European Energy Performance of Buildings Directive, the Greenhouse Gas (GHG Protocol), ISO standards etc.

Going beyond 'Business-As-Usual': The bidder teams will be expected to demonstrate how the proposed project performs better than a 'business as usual' approach and demonstrates exemplary standards of environmental/social/architectural practice.

Where numerical information is necessary (i.e. kWh/m^2/yr, kg CO_2, MW etc.), supplementary calculations or supporting evidence must be provided as an appendix to the submission document.

Format of response: Bidder teams will be expected to explain how they intend to address the challenges within their "Presentation of the Project" document (document 2 of the final proposal). This "Presentation of the Project" document must not exceed the maximum of 50 pages (A3 or tabloid format).

Bidders however can provide an appendix of no more than 20 pages (A3 or tabloid format) in order to disclose all relevant quantitative details. For example this appendix could include:

- Calculations
- Clearly sourced databases
- Explained methodology and/or calculations
- Stated assumptions and hypotheses

- Transparent usage of international standards and obtained scores
- Use of Business-As-Usual reference case comparison

Evaluation: We recognize that bidder teams may not address all 10 challenges within their project proposals[1]. Only the relevant challenges, which are chosen and addressed by the bidder teams, will be assessed.

In order to evaluate the content of project solutions to the challenges, the solutions will be assessed based on their environmental ambition, innovative approach and feasibility. In order to evaluate the quality of the solutions, the evaluation methodology will give most credit to the projects that display consistent, comprehensive and directly relevant evidence and justifications for their solutions. Solutions substantiated by independent sources, previous successful projects and credible calculations will be valued, as well as projects that can be easily replicable.

[1] NB: Challenge 1 is mandatory, if this challenge has not been addressed the proposal will be deemed non-compliant

Challenge 1 - Site energy efficiency and supply of clean energy (mandatory)

Overview of the challenge: This is the only mandatory challenge. The list of questions to consider remains guidance and specific answers to each question are not mandatory**.**

The proposed development should go beyond current 'business as usual' energy standards to demonstrate exemplary energy efficiency, clean energy usage and strive to achieve 'zero carbon' or 'carbon positive' status. The energy strategy developed by the bidder teams should strive to include the following: (i) passive design and efficient building form and fabric; (ii) energy efficient appliances/equipment; (iii) occupant control, monitoring and evaluation of energy consumption; (iv) on-site and off-site production and consumption of renewable energy; (v) energy storage; (vi) societal benefits related to sustainable energy.

Energy efficiency is the highest priority in the design and operation of the buildings and public spaces. This means minimizing the amount of energy a building uses for heating, cooling, hot water, lighting, ventilation, electrical services etc. Fostering the production and use of clean energy at the site is also key.

The objective of this challenge is to provide details on the expected energy supply and demand for your project including the corresponding environmental impact, in terms of GHG emissions.

Questions to consider in your response:

Energy efficient design:

1. **How will your project reduce energy consumption on-site through passive design/ efficient form and fabric?**

   E.g. enhanced building fabric specification, bioclimatic design/solar/shading optimization, optimized thermal mass, air tightness, reduced thermal bridging, maximized use of daylight, passive ventilation, passivhaus or equivalent design standards, etc.

Energy efficient HVAC, lighting and appliances:

2. **How does your project consider energy efficiency during its occupancy and usage? Which energy efficient equipment and appliances are intended on being integrated for the following usages: (i) heating/cooling, (ii) hot water, (iii) lighting and (iv) ventilation, (v) significant other energy usage[2]?**
   a. **What type of energy is expected to be consumed per usage?**
   b. **How much energy is expected to be consumed per usage in kWh/m²/year and kWh/year.**

[2] N.B. In the case that your project incorporates a retrofit, please separate corresponding surfaces and energy units for new build and renovation.

E.g. highly efficiency heating/cooling, efficient electrical appliances and mechanical equipment, advanced building controls, etc.

Clean energy usage:

3. **How will your project use clean energy?**
   a. **How does your project reduce its external energy purchases thanks to on-site consumption of installed renewable energy produced on-site? Please include capacities installed in kW.**

      E.g. consumed solar photovoltaic and solar thermal, air source/solar heat pump, biogas, combined heat and power, ground source heat pumps, (micro) hydro power, waste to energy…

   b. **What types of renewable or low-carbon energy could be produced off-site and consumed on-site? How could the site purchase this energy (e.g. Power Purchase Agreement (PPA), guarantees of origin)?**

   c. **What is the total expected renewable energy consumption in kWh and in % of total energy consumption?**

   d. **What is the expected carbon footprint for the energy consumption of your project (per usage) in $kgCO_2e/m^2$/year or tCO_2e/year? Please specify the carbon intensity breakdown in the appendix.**

Energy efficient control and monitoring:

4. **How will occupants be able to control, monitor and evaluate their energy consumption?**

   E.g. monitoring for installed devices, such as movement sensor lighting, connected appliances, for HVAC: use of natural ventilation when outdoor temperatures permit. Monitoring devices for future appliances, such as centralized systems for power outlets. Monitoring systems to enable charging of electric vehicle or shifting of other energy demand during off-peak /low-carbon hours, building handover material for management towards optimization, such as training material, videos, manuals, log books, etc.

Energy storage:

5. **How and why is energy storage considered in your project?**

   E.g. Energy storage systems, such as batteries, instead of fossil fuel based generators, energy storage system in place in order to increase on-site renewable energy consumption, energy storage system in order to shift energy consumption to off peak hours (including thermal mass and energy storage descriptions), etc.

Energy societal benefits:

6. **How will your project create social benefits related to low-carbon design (including carbon off-setting)?**

   E.g. renewable electricity exports, such as export of photovoltaic electricity, heat exports, such as district heating, biogas production through methanization for transport systems, support given to offsetting projects in the local area in order to lower the overall carbon footprint of the project, purchase of carbon offsetting credits, etc.

Challenge 2 - Sustainable materials management, circular economy and waste

Overview of the challenge: This challenge requires implementing solutions and best practices at every stage of the project, including the design, tender, construction and the future management of the site.

The objective is to reduce greenhouse gas emissions through material and waste management, while providing co-benefits such as reduction in scarce resources extraction and fossil fuel consumption. For this challenge, proposals should briefly describe their overall approach to sustainable materials management and the circular economy.

Questions to consider in your response:

Carbon assessment with Life Cycle approach:

1. **How has a Life Cycle Assessment approach been used in order to make low-carbon decisions in project design and materials to be used in the project? Please refer to all stages of the lifecycle and include a relevant comparison with the environmental impact of a baseline reference situation.**

    a. **Sustainable materials type/nature: How has low-carbon and ecological thinking been considered for the type of material used for your project?**

    E.g. using recycled materials/wood instead of carbon and energy intensive materials (such as virgin steel or cement).

    *Example for a comparison with a BAU situation (for France): Use of a Cross Laminated Timber (CLT) wooden exterior façade instead of concrete; methodology used E+/C-, explanation for why using concrete is the BAU reference scenario, project lifetime of 50 years, project lifetime in accordance with local E+C- Regulation, calculation of emissions per m^2 for CLT wood 20 cm and emission factor of 105 $kgCO_2e/m^2$ (e.g. calculation 105 * 0,2 = 21 $kgCO_2e/m^2$), emission reduction over the lifetime of the project = [BAU emissions] – [Chosen solution emission]. Use of local specific regulation/methodologies, etc.*

    b. **Sustainable material origin: How does your choice of the geographic origin of your procured materials take into account low-carbon and environmental issues? As mentioned above, if relevant, include tCO_2e emissions related to the logistics of procured materials.**

    E.g. choosing construction materials that minimize greenhouse gas emissions thanks to their local origin (reducing transport emissions), etc.

    c. **Sustainable materials manufacturing: How has low-carbon and ecological thinking been considered for the manufacturing of materials used for your project? As mentioned above, if relevant, include tCO_2e emissions related to the manufacturing of materials.**

E.g. choosing construction processes that minimize greenhouse gas emissions and use a limited amount of energy in order to be produced, choosing suppliers that use biomass or waste in order to generate the energy required for production of materials, etc.

Sustainable building and infrastructure design:

2. **How does your project's infrastructure consider modularity/flexible design for future uses/extensions? If so, how?**

   E.g. enabling future adaptation of the building through improved modularity, a building space that can serve multiple purposes, ease of maintenance, opportunities for dismantling at the end of the life cycle, etc.

3. **If you have given preference to retrofits over new build for your project, please specify the surface in m^2 that is to undergo renovation and the volume in m^3 of the material (e.g. the concrete) that would otherwise have been required in the case of a new build.**

4. **Has the building or development been designed to minimize the amount of materials needed over BAU while ensuring good building performance?**

   E*.g. by designing lightweight yet well insulated building fabric, use of aerated materials, good space management to minimize required m2 of building space, minimization of storage space (including parking lots, equipment and appliance storage areas), etc.*

Sustainable material waste management:

5. **How does your project consider low-carbon or environmentally friendly waste management? If so, how? (If relevant, include tCO_2e emissions related to waste management of materials).**

   a. **For construction materials waste?**

      E.g. reducing the generation of demolition waste by using materials with a potential to be dismantled at the end of lifecycle for re-use, transforming discarded resources back into raw materials, limiting construction waste, recycling waste, etc.

   b. **For waste during occupation?**

      E.g. designing physical spaces for separated waste collection within buildings in order to manage waste effectively, occupants reducing waste production by treating the waste produced, purchasing less thanks to local suppliers, composting, on-site anaerobic digestion, on-site gardens and vegetable patches for on site consumption, etc.

Challenge 3 - Low-carbon mobility

Overview of the challenge: The bidder teams should design their projects to facilitate and encourage walking, cycling, public transport, shared vehicles and electric and other low-emission vehicles and to de-incentivize the use of fossil fuel transport.

The proposed development should go beyond 'business as usual' to demonstrate exemplary standards of green mobility to reduce energy consumption related to transport as well as to contribute to clean air standards.

Questions to consider in your response:

Low-carbon transport incentives:

1. **How will the project encourage walking?**

   E.g. Greening and shade, pedestrian centric layout, new links to existing walking route, accessible for users of all mobility types, accessible walkways to existing communal transport hubs, provision of outdoor seating/rest areas, provision of drinking water, financial incentives for pedestrians, etc.

2. **How will the project encourage cycling?**

   E.g. number of covered/secure cycle storage (total or per occupant), new cycle hire scheme or new link to existing scheme, showers, changing facilities and lockers, new cycle route or new link to existing cycle route, provision of drinking water, financial incentives for cyclists, etc.

3. **How will the project encourage an increased use of existing transport systems?**

   E.g. new links to existing transport stop/station, live transport updates, use of smart technology, electronic/integrated payment systems, journey planning services, financial incentives for communal transport users, etc.

4. **How will the project encourage use of electric or low-carbon vehicles?**

   E.g. number of electric vehicle parking and charging points (total or per occupant), new electric vehicle hire scheme or link to existing car hire scheme, localized solar powered car ports, financial and other incentives for electric/low-emission vehicles, emissions standards for vehicles, etc.

Minimizing overall transport emissions:

5. **How will the project minimize the use of diesel and petrol vehicles?**

   E.g. no/limited parking for diesel and petrol vehicles, right of way for pedestrians and cyclists, speed restrictions, no idling policy, financial incentives for alternative transport methods, etc.

6. **How will transportation emissions be minimized during the construction phase and during occupancy (post completion)?**

   E.g. procurement planning to minimize deliveries, route optimization, coordinating deliveries with local sites, telematic controls for construction vehicles, no idling policy, eco-driver training for operators, use of clean fleet vehicles, monitoring mileage and emissions, incentive scheme, etc.

Challenge 4 - Resilience and adaptation

Overview of the challenge: Bidder teams should consider demonstrating the integration of climate resilience considerations throughout the project, based on a climate risk assessment specific to the site location.

Please describe your adaptation strategy specific to your site and City. This includes innovative solutions to prepare for current and future climate change in the City, such as increases in the probability and severity of extreme weather events, heat waves, flooding, drought and sea level rise. Please incorporate in your response specific adaptation measures that have been taken into account in project design.

NB: All measures regarding rainwater (e.g. capture and storage, water saving, run-off, treatment) can be addressed in Challenge 7.

Questions to consider in your response:

Risk assessment:

1. **What are the main climate change hazards the neighborhood has faced / will face ?**

   E.g. The assessment can take into account the five main hazards cities have to face, heat waves, flooding, storms, drought, and sea level rise; but also a more broader analysis of extreme cold events, wild fire, landslide, chemical or biological hazards. It can also consider the existing infrastructures and risk management measures in the neighborhood.

Resilient design:

2. **How is your infrastructure design adapted to the local (location specific) future climate change risks?**

   *E.g. Orientation to get the sun energy but avoid over-heating the building, analysis of the shadows in summer (especially over the pedestrian and cycling areas), natural cooling, design adapted to increased wind speeds (requires an analysis of the neighborhood morphology), foundations, raised crawl space type, light impact foundations, earth coupled, mechanisms to resist natural disaster (landslides, flooding), **r**esilient structural design, water impacts, driving wind, temperature changes, presence of courtyard or inner garden within the building, etc.*

3. **How do the façades in your project take into account the physical risks of climate change? (If relevant, include the surface in m² related to the protected area).**

   a. **For vertical façades:**

      E.g. External removable or fixed blinds for solar protection, suitable glazing specification for daylight exposure and minimum heat gain, visual Light Transmission, UV coatings, thermal performance, seals, internal glare provision for

occupants, increased peak temperatures, use of white paint or reflective materials for facades, presence of vegetated facades, presence of "photovoltaic cladding" on façade, etc.

b. **For the roof infrastructure:**

E.g. Presence of a bio diverse roof, (specify surface in m²), for flat roofs: presence of white paint/gravel or reflective coatings, presence of a rainwater storage/buffer system, presence of an energy producing equipment, etc.

4. **Have complementary actions been taken in order to cope with other indirect climate induced hazards?**

E.g. for wildfires or landslides depending on the city and location specific climate analysis

Resilient occupancy:

5. **How does your project integrate location-specific climate change adapted mechanical and electrical systems?**

   a. **How has your project considered into its design future heating and cooling needs?**

   b. **How has your project integrated these heating and cooling needs into the energy capacity scaling of equipment (in terms of power required)?**

   E.g. for heating/cooling, ventilation, air conditioning

   Protected electrical systems, raised above the possible level of flooding (transformers, electrical cabinets), provision of secondary secure supply such as generator or sufficient battery back up in the event of power outages, provision of energy efficient appliances in the case of energy poverty, etc.

6. **How does your project encourage people to adapt their behavior in case of an extreme weather event?**

   E.g. Manual solar protection (in opposition to smart solar protections), fountains in the public space, presence of cool areas (tree canopy, or shadow in winter), community awareness of the vulnerable people and solidarity systems.

Challenge 5 - New green services for the site and neighborhood

Overview of the challenge: Bidder teams should consider using the site as a catalyst to develop innovative urban services for the neighborhood that help reduce the environmental footprint of the city and create social community benefits. The project should strive to for example promote reduced air, water and soil pollution and create sustainable jobs whilst boosting the local economy.

Questions to consider in your response:

Environmental and social benefits of green services:

1. **What types of new green services will your proposal provide for the city?**

   E.g. supply and export of clean energy, waste management services, shared economy services, new or improved public space, green transport, urban agriculture, sustainability education, ecosystem services, water management, etc.

   a. **What social value will the new green services provide?**

      E.g. creation of new jobs, living wages/fair pay and working conditions, proportion of low skilled vs. highly skilled jobs, proportion of jobs ring-fenced for local residents, improved community cohesion, cultural impact, etc.

   b. **What environmental value will the new green services provide to the city?** Where possible quantify the expected impact of the new green services i.e. the reduction in tons of CO_2e or landfill waste, based on examples of previous projects.

      E.g. reduced carbon emissions, reduce air pollution, reduced waste and pollution, using bio-chemical means to depollute a former industrial site, etc.

Sustainability of green services:

2. **How will your proposed business model sustain the expected environmental and societal benefits for the long term?** Where possible provide examples of previous successful sustainable enterprise models and the quantified social and economic value of past projects.

   E.g. regular consultations and check ups on impacts of the social return on investment

Challenge 6 – Clean growth and smart cities

Overview of the challenge: Bidder teams should demonstrate how their proposals contribute to the smart city agenda, from the design, construction and management of the site, through to the types of organizations that will be hosted on the site. Bidder teams should demonstrate how the project would adopt digitization for sustainability and foster technological innovation. Bidder teams are encouraged to demonstrate the potential for replicating and scaling up their proposals.

Questions to consider in your response:

Smart city approach:

1. **How will the project use innovative digital technology in its design, implementation and management?**

   E.g. use of Building Information Modeling in design through to phased construction, Virtual Reality tools to communicate design, interactive environments to engage stakeholders, dynamic climate modeling and design for scenario testing, intelligent prefabrication or flexible construction, sensor technology to measure performance, smart phone technology to engage with occupants, building management or control room technology to monitor and manage performance, partnering agreements for impact, block chain approaches to support citizen involvement and local based economies for impact, etc.

2. **How will your project capture, collect and use data and technology to evidence impact from design through to occupation and renewal?**

   E.g. advanced monitoring for environmental and social impact data collection, etc.

Green growth support:

3. **How will your project and final site foster innovative green start-up companies?**

   E.g. provide co-working/flexible/affordable/green workspace, shared equipment/workshops/'fab-labs', start-up investment, incubator programs, networking opportunities, fast-tracked private and public procurement opportunities, etc.

4. **How will your project demonstrate innovation in green growth?**

   E.g. shared economy/industrial symbiosis opportunities with local industries (i.e. use waste product from one industry as raw material for activities on site), use of smart technology/digital applications, integrated public services, etc.

Challenge 7 - Sustainable water management

Overview of the challenge: Bidder teams should consider both potable and non-potable water management in the design of their project and should prioritize water saving where possible.

Consider your current and future (i.e. 2050) climate impacts on water resources for your location, in particular for expected increased rainfall and/or droughts. Describe how your project takes into account this analysis.

Please state your major sources of water consumption for your project. Indicate for each what water management measures have been used in order to save this resource.

Questions to consider in your response:

Water scarcity management:

1. **In the case of water scarcity for your site, how has your project incorporated municipal water savings measures?** Please specify the projected quantity of liters saved per year (unit: liters/year). Please compare the liters of saved water, with the liters consumed directly from the municipal system.

   E.g. (i) Water efficient equipment in order to limit water usage, such as low-flow fixtures and appliances, water efficient plumbing, smart-metering solutions for users to track and adapt their water usage. (ii) Rainwater capture and storage for potable use, such as the presence of water capture and storage basins/roof reservoirs. (iii) purple pipe system for re-use of wastewater, such as use of wastewater instead of drinking water for non-potable uses (e.g. irrigation) or wastewater recycling services for potable uses. (iv) Use of an external water source (separate from municipal system), such as water desalination plants, the use of river water, and integrated wells on-site (in the case of local water treatment for potable usage, a detailed energy and carbon assessment is required), etc.

2. **How does your project raise inhabitants' awareness about water scarcity risks and is the project for the site adaptable to droughts?**

   E.g. Soft social measures by the city on water saving, public information on water resources.

   Water plazas that turn in to recreational areas when dry, etc.

Excess water management:

3. **In the case of excess water supply, how does your project consider water evacuation management measures?**

E.g. Run-off water infrastructure, scaling of plumbing and sewerage pipe systems to prepare for extreme rainfall conditions, sizing of gutters to prepare for extreme rainfall conditions, sustainable urban drainage (SUDs), etc.

4. **How does your project consider water storage or buffering in order to avoid flooding the city water system?**

   E.g. Water tank, water plaza, ponds, green or blue roofs, presence of green space or permeable surfaces, analysis of the neighborhood surface water absorption, permeable roads or parks nearby, etc.

5. **How does the project raise the inhabitants awareness of the flood risk (in case of a high probability event) and is the project for the site adaptable to flooding?**

   E.g. Soft social measures by the city on flooding events, public information on what to do in the event of a flood, etc.

   Multiple use areas depending on the water levels, elevated entrance, power production equipment elevated, etc.

Water treatment:

6. **If relevant, how does your project consider measures to depollute and treat water before sewage dispatch?**

   E.g. Presence of wastewater treatment solution that is integrated with biomass systems, drainage systems (SuDs), etc.

Challenge 8 - Biodiversity, urban re-vegetation and agriculture

Overview of the challenge: Bidder teams should consider how to promote biodiversity, urban re-vegetation and agriculture on the site, to provide additional green space and facilitate important ecosystem services.

Questions to consider in your response:

Biodiversity protection and preservation:

1. **How will local ecological species and habitats be protected and maintained?**

   E.g. formal ecological assessment undertaken, official statement of site's ecological importance, long-term protection of endangered/mature species/nesting grounds/habitats presence of a blue/green grid at a large scale, etc.

2. **How will the site foster and improve biodiversity?**

   E.g. increase in green space, increase in waterways, increase in number of species, pollinator friendly planting, indigenous species planting, creation of/link to wildlife corridors, retention of mature species, green roofs, green walls, container planting, etc.

3. **How will the project increase citizen education and awareness on themes of nature and biodiversity?**

   E.g. visitor centers, educational programs or activities, etc.

Local agriculture:

4. **How will the site promote local food/crop production?**

   E.g. land/space dedicated to food production, value-added food production activities on site (turning raw food material into a refined product), supplying on site or local communities with food products, policy for procuring locally source food for the site, etc.

Urban re-vegetation:

5. **What is the change in green space area of the site (%)?**

   E.g. calculate the area of green/blue space before and after the development: has the proportion increased or decreased, if so by how much? This could include green roofs, green walls, planters/containers, ponds, waterways, as well as land areas, etc.

   a. **What percentage is accessible by the public?**

      E.g. Non-accessible roof compared to a public park, etc.

b. What percentage is to be maintained by the public?

E.g. Community or shared garden compared to inhabitants' private gardens, city space compared to green areas owned by private companies, etc.

Challenge 9 – Inclusive actions and community benefits

Overview of the challenge: Bidder teams should propose a project that strives to serve the needs of the residents and the neighborhood where it is located. An emphasis should be placed on understanding the existing neighborhood context so that the project is responsive to major needs, challenges and issues of the local residents and businesses (both those in the formal and informal economy). Examples include developing projects that will be accessible to different parts of the population (social background, age, gender, origin, economic status, etc.), prioritizing dense, mixed-used development, and promoting projects and activities that support citizen health and wellness.

The winning team will be required to involve local stakeholders and surrounding neighborhoods in the project design and future management; effective community engagement is important to ensure that the proposed project is relevant and appropriate for those living and working in the area.

Questions to consider in your response:

1. **How do you propose to engage and involve the local community in the decision-making process?**

   E.g. stakeholder mapping, methods to ensure your project planning, design and implementation is inclusive and accessible to all stakeholders: different formats of roundtables and public meetings, local app or radio, emphasis on culture as a way to bring interest to the site (through street-art, forums, workshops, etc.), events (for the launch of the project, disseminated through the timeframe of the program), exploratory walks with local stakeholders to experience and reflect upon the potential of the site collectively, transitory occupation of the site fostering the development of new uses etc.

2. **How will your engagement strategy develop through all phases of the project (construction, installation, operation, etc.)?**

   E.g. a wide set of actions for every phase of the project, including co-conception roundtables and local participation prior to the construction on site, participative building on site, set up resident management associations, provide training to occupants etc.

3. **How will your project meet the needs of the local community?**

   E.g. creation of participatory processes (app, workshops, review of existing local research/projects etc.) that will identify needs of the local community and will adapt the solutions proposed to those needs (i.e. social and affordable housing, inclusion of services such as kindergarten, local shops, flexible use of space), etc.

4. **How will your project create spaces dedicated to public/collective use and needs?**

   E.g. shared gardens, and communal places dedicated to community use and shared services, etc.

5. **How will your project promote innovative/alternative living arrangements that take into consideration all genders, ages and social background?**

   E.g. mixed-used development, intergenerational living arrangement, social housing, student housing, cooperative and participative housing, etc.

6. **How the design of your project support the citizen health and wellness and foster activity and connectedness**

   E.g. design of public space, foster sport and leisure activities, prevent and protect from air pollution, etc.

Challenge 10 – Innovative architecture and urban design

Overview of the challenge: Projects must upgrade the site while integrating into the urban environment and the wider neighborhood in which the site is located. The bidder team will propose a unique world-class architectural approach through spatial design, building form, choice of materials, use of natural light, and artistic elements among others. This may also include activating new places such as "underutilized" spaces (e.g. rooftops or basements), developing new types of services for the inhabitants and the users of the site, designing public space to foster activity and connectedness. Besides upgrading the site itself, proposals must therefore also contribute to improving the wider precinct or neighborhood in which it is located.

Questions to consider in your response:

1. **How is my project integrated within the surrounding area? How does it interface with the rest of the neighborhood?**

   E.g. respect of cultural heritage, continuity of walking and cycling routes and public space across the site itself, etc.

2. **Does my architectural project involve the use of pioneering sustainable materials or recycled materials that participate into a creative design?**

   E.g. construction materials such as sustainable wood, rocks, mud/clay bricks, or recycled materials, etc.

3. **How does my project stand out with an innovative design? How does my project promote the cultural heritage and contribute to the attractiveness and uniqueness of the City?**

   E.g. use of technologies as part of the design, showcasing the city heritage while promoting artistic creation and contemporary design, etc.

4. **How does my project's design make best use of all available spaces or propose public space to foster outdoor activities and connectedness?**

   E.g. rooftops, basements, attics, lofts, wells, new park or public space, etc.

5. **How does my project reflect upon the adaptability of design and uses, and anticipate new lifestyles?**

   E.g. adaptable and modular floors, partition walls, shared used, anticipate new way of living working, etc.

Appendix – Main principles of the carbon assessment

As each project must aspire to being zero carbon, all bidder teams will have to provide a clear and reliable assessment of the greenhouse gases emissions of their project; this will be required at the second phase of the competition. As we expect bidder teams to submit different types of innovative projects, for different types of sites, further specific guidance on the methodology for assessing greenhouse gases emissions will be provided to the finalist teams before phase two.

Key Definitions and Meanings

Greenhouse gas emissions: the terms 'greenhouse gas' (GHG), carbon and carbon dioxide emissions are often used interchangeably. For the purpose of this assessment, we consider all greenhouse gas emissions as carbon dioxide equivalent emissions (CO2e), as per the Kyoto Protocol convention.

Operational carbon: refers to the greenhouse gas emissions generated on a yearly basis through the running and occupation of the building.

Zero carbon: for this assessment, zero carbon refers to 'net zero' greenhouse gas emissions. This means that all sources of greenhouse gas emissions are balanced by greenhouse gas emission sinks (capture or storage).

Carbon positive: when the stores (sinks) of greenhouse gases are greater than the release of greenhouse gas emissions, or the amount of renewable energy generated onsite is greater than the amount of energy consumed onsite, for example.

Life Cycle Assessment: An LCA is a technique to assess the potential environmental impacts associated with a product or service over the lifecycle of this product/service (from extraction of resources, until final disposal of materials). An LCA (i) compiles an inventory of relevant inputs and outputs, (ii) evaluates the potential environmental impacts of the associated inputs and outputs, (iii) interprets the results. For this carbon assessment, the LCA is based only on the environmental impact related to climate change by greenhouse gas emissions. For a building, a life cycle GHG assessment would cover the emissions from manufacturing and transporting the building materials, constructing the building, operating and maintaining the building, and disposal of any materials not reused at end of life.

BAU reference situation: A scenario for future patterns of activity, which assumes that there will be no significant change in people's attitudes and priorities, or no major changes in technology, economics, or policies, so that normal circumstances can be expected to continue unchanged (Source: Oxford dictionary).

Emission reduction: An emissions reduction refers to the difference between the emissions from a theoretical BAU scenario and the emissions related to the low-carbon solution proposed by the project.

All bidder teams must have in mind that the following main principles will be applicable for the detailed carbon footprint:

Transparency: bidder teams will need to ensure that their methodology for the carbon assessment is fully transparent. Bidder teams will be required to disclose all relevant methods, data sources, calculations, assumptions and uncertainties to enable the reviewers to assess the credibility of the results.

Use of recognized methods for assessing sustainability: the bidder teams should comply with nationally and locally required sustainability standards and methodologies, where applicable, for example GHG Protocol, Bilan Carbone, LEED, BREEAM, Estidama, EDGE, ISO standards, etc.

Beyond 'business as usual': for all stages of the project, the bidding teams will be expected to qualify the priorities made and demonstrate how the proposed project performs better than a 'business as usual' approach through a description of actions taken to achieve GHG reductions against prevailing norms. If possible, quantify the avoided emissions that would occur outside of the chosen site but are possible thanks to the project (for example an increase in electric mobility thanks to a new charge infrastructure or a new construction technique that will be made available publicly after the project). Special recognition will be given to projects that show innovation in greenhouse gas reductions, or those which achieve 'carbon positive' status.

Scope: Bidder teams will be expected to consider the carbon impact of the project throughout the project, quantifying greenhouse gas emissions where possible and demonstrating the proactive measures taken to reduce actual and embodied greenhouse emissions relative to common practice, at the following stages:

- Pre-construction: procurement strategy and allocation of responsibilities from contractual obligations to incentivized carbon performance approaches
- Construction: energy used during construction, embodied energy of materials etc.
- Occupation: all energy used during the operation of the building. Please use location-based emission factors for energy usage (market-based is optional).
- Expected maintenance and renovation through the lifetime of the building (e.g. solar panels, heating system, elevators, etc.)
- Transportation from people, goods and materials going to and from the building
- End of life: energy required for deconstruction, reuse of building materials etc.

Highlight the specific efficiency of the project, by providing a relevant key performance indicator (KPI): for example $kgCO_{2e}$/m2, $kgCO_{2e}$/desk, $kgCO_{2e}$/specific activity, etc.

Use of carbon offsets: all projects should adhere to the energy hierarchy (see climate challenge 1), with carbon offsetting used as a last resort to account for unavoidable greenhouse gas emissions. All carbon offsetting must comply with internationally accepted carbon offset criteria, and should occur locally or be directly related to the project of the bidder teams.

Impact and replicability: special recognition will be given to projects which demonstrate a future proofing approach how innovation and deep GHG emissions reductions* could be replicated beyond the selected site