# Appendix C
# Sample: Low Carbon Resilience and Environmental Sustainability Scope of Work

**For Business Planning at Fraser Health, Providence Health Care, Provincial Health Services Authority, and Vancouver Coastal Health**
4/25/2023

## Scope of Work Objectives

The goal of this scope of work (SOW) is to produce an integrated low carbon resilience and environmental sustainability report with results and recommendations that are incorporated into the business plan (e.g. summary overview, design package, and cost estimate report).

The integrated low carbon resilience and environmental sustainability report should include a summary of key findings from below sections while providing a coherent narrative of all resilient, sustainable and low carbon design strategies:

1. Climate Risk Assessment as part of the design team's orientation to the project.
2. Sustainable Design Strategies Report assessing diverse elements of environmental sustainability in order to identify sustainable building design strategies that align with health organization's clinical, patient healing, staff well-being, population and environmental health objectives.
3. Low Carbon Study incorporating key results and recommendations from (1) and (2).
4. Annotated LEED Gold Scorecard (or equivalent certification, e.g. WELL Standard or Living Building Challenge).

The objective is to develop a base design and design options that:

5. Meet specific requirements in the Ministry of Health (MoH) Capital Policy Manual policies:
   a. Chapter 11 *Environmental Sustainability and LEED Gold Certification*;
   b. Chapter 12: *Carbon Neutral and Climate Resilient Health Facilities;*
   c. Chapter 14: *Use of Wood in Health Care Facilities*;
6. Align with directions provided by the Treasury Board to the Project Team;
7. Ensure integration and/or alignment with the
   a. *Low Carbon Resilience and Environmental Sustainability (LCRES) Guidelines for Health Care New Construction* (July 2023)
   b. *Climate Resilience Guidelines for BC Health Facility Planning and Design* (December 2020, v1.1) see Appendix F of LCRES Guidelines.
   c. BC *Climate Resilience Framework & Standards for Public Sector Buildings,* see Appendix E of LCRES Guidelines.
8. Align health organization goals, targets and key performance indicators (see Appendix A) and policies;
9. Follow the process, including inputs/outputs outlined in Integrated Timeline, attached.

Required knowledge and skills include:

10. Climate change expert(s) with climate risk assessment experience;
11. Energy modeller with experience establishing future design conditions using future climate projections data and future shifted weather files;
12. Health care design and construction professionals with environmental sustainability experience in, life cycle assessments, healing environments and materials, waste and water reduction, active and clean transportation, and indoor air quality;
13. LEED (or equivalent) professionals;
14. Workshop facilitators and coordinators.

## Process expectations

At project initiation, the Prime Consultant will conduct a kick off meeting with health organization's Energy and Environmental Sustainability (EES) representatives to pass on relevant resources, share learnings from previous projects and discuss critical design objectives, preliminary LEED scorecard, and integrated timeline milestones. Project-specific opportunities to reduce environmental impact and increase low carbon resilience should be identified. Subsequently, EES representatives should be engaged throughout the process via regular check-in meetings with key client representatives.

**A. Climate Risk Assessment**

To meet Requirements #3 and #4 in the MoH Chapter 12: *Carbon Neutral and Climate Resilient Health Facilities* policy during Business Plan development, and enable the project to meet Requirements #5 and #6 post-Business Plan approval, the Successful Proponent will:

1. Review, synthesize and present relevant climate hazard and risk information produced by the Authority[1], other publicly available and peer-reviewed resources[2], and other resources as required for a comprehensive, accurate and nuanced understanding of the site's context.

2. Identify information needs and gaps (e.g. impact of increasing rainfall intensity), and propose an approach to address gaps to inform design and costing (e.g. modify or expand scope of work).

3. Design and carry out a Climate Risk Assessment workshop in close coordination with the Authority's subject matter experts, project team, and key stakeholders (e.g. local government) where appropriate. Consider:
    a. Stakeholder participation: Invite key stakeholders that are representative of the site's critical services and infrastructure. It is suggested to share select materials ahead of the workshop to provide context for participants.
    b. Key components of the workshop include: establish context, identify hazards and impacts, explore vulnerability (to people, services, and infrastructure), evaluate climate risks, brainstorm resilient design objectives and strategies, and identify co-benefits (e.g.

[1] At minimum and where available: the Authority's climate hazard exposure screen results, high level master plan, site, facility and infrastructure plans; future climate projections and reports (*e.g. Moving Towards Climate Resilient Health Facilities* series).
[2] See *Additional Resources* in the Resilience Guidelines' Online Resources section.

emissions reduction, pandemic or seismic resilience, human health and well-being). Where possible, identify next steps and potential leads (e.g. person, department, organization).

c. Refer to the *Climate Resilience Guidelines for BC Health Facility Planning and Design* (December 2020, v1.1) for additional guidance on workshop preparation, implementation and reporting.

4. Help to inform accurate cost estimates for 'enhanced' resilient design strategies (relative to base design) and adaptation pathways by including the Authority's Quantity Surveyor throughout the process.

5. Prepare a Climate Risk Assessment workshop summary report that includes at minimum:
    a. An outline of the workshop input, approach and process, noting any deviations from the four-step *Climate Risk and Resilience Assessment* methodology[3], along with rationale and recommendations.
    b. Summary tables and narrative analyses of key components including: context, hazards, impacts, vulnerabilities and risks. Note any modification or exclusions with justifications.
    c. Summary tables and narrative analyses of key outputs including: resilient design objectives and strategies, co-benefits, and adaptation pathways to facility end-life.
    d. Resilient design strategies recommended for inclusion in the 'base' and 'enhanced' design options, as defined in consultation with the Authority's subject matter experts.
    e. Recommended next steps to reduce and manage climate risks in design and operations.
    f. An annotated list and synthesis of:
        i. data and information reviewed;
        ii. climate hazard and risk resources consulted;
        iii. stakeholders, critical services and infrastructure included.

**B. Environmental Sustainability**

As part of the development of sustainable design strategies, the Successful Proponent will be required to:

1. Conduct a preliminary Low Carbon and Environmental Sustainability workshop[4] with clinical and non-clinical stakeholders with the intention of:
    a. setting objectives and priorities for the project;
    b. identifying sustainable building design strategies that align with climate resilience design strategies, improve clinical objectives, and maximize patient healing, staff well-being and population health outcomes[5].
2. Complete workshop prior to, or early in Schematic Design so there is greater opportunity for workshop results to influence design strategies.

[3] See Climate Risk and Resilience Assessment Methodology in the LCRES Guidelines' Online Resources section.
[4] The Low Carbon and Environmental Sustainability workshop should align with and/or build on the Climate Risk Assessment workshop.
[5] The level of design strategy detail shared with workshop participants should be adequate for the audience. It may be preferable to have detailed design strategy conversations with specific groups in separate working meetings.

3. Write a workshop summary report to include participants, activities, results and recommendations.
4. Develop a qualitative and, where possible, quantitative cost/benefit comparison of 'enhanced' design strategies (relative to base design). Design strategies will be determined collaboratively with EES and the project team in order to create alignment with the project location, services, vision and principles, as well as, low carbon and resilience objectives.
5. Help to inform accurate cost estimates for 'enhanced' sustainable design strategies (relative to base design) by including the project's Quantity Surveyor throughout the process.
6. Develop preliminary embodied carbon analysis of the building design, including high level options for reducing carbon emissions through alternative material selections. Options to reduce embodied carbon should include capital cost impact, including both Mass Timber and lower GHG-intensity cement products.
7. Include, where appropriate:
    a. Considerations for operations and maintenance of the building.
    b. Recommendations for additional analysis to be completed prior to, or during the RFP and owner's project requirements (OPR) development stages.
    c. Recommendations for future health organization new construction projects with the intention of continuous learning and improvement.

**C. Low Carbon Study**

To meet Requirements #1 and #2 in the MoH Chapter 12: *Carbon Neutral and Climate Resilient Health Facilities* Policy, the Successful Proponent will carry out a Low Carbon Study to develop a baseline and multiple design options (noting that options below are subject to change):

- **Baseline**: Baseline of LEED Gold by adopting energy efficiency measures and deploying low carbon heating and cooling systems that meet operational requirements under local conditions. Baseline to include electrification measures that are cost neutral in comparison to conventional natural gas systems.

- **Option 1 Low Carbon**: An enhanced version of the baseline, with additional further low carbon design features with an incremental cost of up to 3% of full project construction costs. Target 50% emission reduction relative to LEED Gold baseline.

- **Option 2 Net Zero Carbon Site**: A further enhanced design to reduce site-level emissions to "net zero", through either fully electrified building design or on-site renewable energy generation. To include scenario analysis for incorporating renewable natural gas.

The objective of the Low Carbon Study is to reduce operational emissions while minimizing operational cost impacts. The Successful Proponent will develop a report outlining the outcomes of an energy model with site-specific future weather files (CWEC 2050), and multiple scenario simulation analysis, for each option under consideration. The Low Carbon Study report should include at minimum:

1. Evaluated Energy Conservation Measures (ECMs), and Low Carbon Measures (LCM) complete with energy use, carbon emissions, capital cost (verified through Quantity Survey) and operating cost performance indicators.
2. Incorporation of 'enhanced' measures from Climate Risk Assessment and Environmental Sustainability Assessment into simulation analysis.
3. Design scenarios consisting of bundles of ECMs; including defined GHGI, TEUI, TEDI, EUI (including total electricity in MWh/year and natural gas in GJ/year), peak demand, absolute carbon emissions and energy cost performance along with a description of the measures implemented in each scenario.
4. Scenario analysis of operating costs for natural gas and electricity price escalation for each ECM/LCM bundle. The highest projected utility cost is to be at least 50% higher than the lowest utility cost escalation. Including predicted increases in the BC carbon tax. Refer to Appendix B for the energy and utility data inputs, outputs and assumptions.
5. Summary report of the energy model input parameters for potential future application by EES representatives through both the CleanBC New Construction Program and FortisBC Commercial New Construction Program.

**D. Integration and LEED Meeting + Scorecard**

Conduct an Integration and LEED meeting with EES representatives and consultants involved in Part A, B and C. The intention of this meeting is to complete the LEED Scorecard, while simultaneously utilizing the time to review the outcomes of Part A, B and C, discuss co-benefits, and review any further low carbon resilience and sustainable design strategies. The outputs of this section should include at minimum:

1. An output table detailing the co-benefits for all recommended design strategies.
2. List of all design strategies that require HA actions.
3. Annotated LEED Score Card including:
    a. Description of what it takes to pursue different credits, compliance paths, and commentary on the level of effort required to meet different point thresholds.
    b. Cost impacts for LEED Gold certification: soft and hard costs, including those incurred by the Successful Proponent during design development, in a low, medium, high cost range applicable to building type and to be determined along with EES Team representative.
    c. Synergies with environmental sustainability, low carbon and climate resilience strategies should be explicitly identified.

# Appendices:

**Appendix A** – Energy and Environmental Sustainability Goals, Targets and KPIs for the Fraser Health, Providence Health Care, Provincial Health Services Authority, and Vancouver Coastal Health

Refer to online Appendix B at www.bcgreencare.ca/resource/guielines

**Appendix B - Energy Modelling Requirements**

Refer to online Appendix G at www.bcgreencare.ca/resource/guidelines