



PROCUREMENT SERVICES

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ADDENDUM No. 2

REQUEST FOR PROPOSALS (RFP) No.: 1220-030-2020-005
TITLE: Waste Heat Recovery Study for Surrey City Energy
ADDENDUM ISSUE DATE: September 28, 2020
REVISED CLOSING DATE AND TIME: ON OR BEFORE THE FOLLOWING DATE AND TIME (THE “CLOSING TIME”):
TIME: 3:00 P.M. (LOCAL TIME)
DATE: October 13, 2020

INFORMATION FOR PROPONENTS

Proponents are advised that Addendum No. 2 to 1220-030-2020-005 is hereby issued by the City. This addendum shall form part of the contract documents and is to be read, interpreted and coordinated with all other parts. The following information is provided to answer questions raised by Proponents for the above-named project, to the extent referenced and shall become a part thereof. No consideration will be allowed for extras due to Proponents or any sub-contractor not being familiar with this addendum. This Addendum No. 2 contains ten (10) pages.

REVISED CLOSING DATE AND TIME:

Revised Closing Date is:

ON OR BEFORE THE FOLLOWING DATE AND TIME (THE “CLOSING TIME”):

TIME: 3:00 P.M. (LOCAL TIME)

DATE: October 13, 2020

CLARIFICATION:

In Schedule A – Scope of Services

Delete Schedule A – Scope of Services as issued for tender in its entirety and substitute with the revised “Schedule A – Scope of Services” as attached to this Addendum. Adjustments made are highlighted.

QUESTIONS AND ANSWERS:

Q1. Schedule A states “the purpose of this project is to study the opportunity for Surrey City Energy to integrate onsite cooling services and/or waste heat recovery within buildings connected to the DE network.” Does the city intend to study owning the onsite cooling equipment and providing cooling to the building?

A1. That is correct. The City intends to explore all options for owning and operating cooling and/or heat recovery equipment.

Q2. Does the city require the successful proponent to recommend a rate structure for the cooling service?

A2. No, the consultant is not required to recommend a rate structure for cooling services or waste heat recovery services. The work to be done under the Financial Analysis section will help inform City staff on the type of rate structure charged to customers for waste heat recovery and/or cooling services.

Q3. Section 3 of Schedule A states the successful proponent is to review previously completed background studies. What studies have been completed and are available?

A3. The following studies will be made available to the successful consultants for review:

- 1) Low-Carbon Thermal Energy Strategy (2018) – The study examples two options to provide low-carbon baseload energy to Surrey City Energy: waste heat plant and a biomass plant. The study included an assessment of target baseload capacity, phasing needs, and available heat resource for each option.
- 2) Hydraulic Analysis (2019) – This report provides a summary of the model of both the hydraulic and thermodynamics of the district energy system, analysis and recommendations for the system that includes the pipe sizing, phasing of energy plants, and operation.

Q4. Section 3 of Schedule A states the successful proponent is to provide a summary of typical heating and cooling demand profiles. Will the City provide the heating demand profile from the buildings currently connected to its DE system?

A4. The City can make available heating demand profiles from existing buildings available from the DE system. However, this data has been collected for heating only and it is limited in its duration. The consultant should be familiar with heating and cooling demands for typical building archetypes.

Q5. Section 3 of Schedule A states the successful proponent is to identify 3 scenarios for integration of cooling and waste-heat recovery with the City's DE system based on assumed building archetypes. Does the City require 3 scenarios for each building archetype?

A5. After reviewing the scope of services, the City has assessed that a total of three (3) would be sufficient to carry out the scenarios described in Section 3.2 (Technical Evaluation) and 3.3 (Financial Analysis) for detailed design and cost estimates.

By the time Section 3.1 Building Archetypes is complete, the City and consultants will decide together on the 3 scenarios that are most promising and interesting to investigate further in the scenarios described in subsequent sections. The scenarios could consider specific building archetypes, cooling and heating demands, location of building to heating plants, heat recovery/cooling system technologies, etc.

Q6. Is financial analysis required for each ownership model?

A6. The ownership models are not specific for each scenario. Ownership models should be applicable to all scenarios and help inform the City as to whether Surrey City Energy should consider owning and/or operating cooling and heat recovery systems.

Q7. Can the City of Surrey confirm date for information session?

A7. There is no information session.

Q8. Page 13: Point # 2 Review DE system operating parameters with City staff – How much time should the consultant budget for this? Will the city provide data for consultant to analyze or the consultant is expected to lead this discussion including offering options?

A8. The consultant should be familiar with operating parameters of Surrey's high temperature district energy system, and as such, should not budget much time on this activity.

Q9. Page 14: Identify and illustrate typical equipment configurations of onsite cooling systems that are compatible with the City's DE system.

a) Develop a checklist of criteria to evaluate the viability of a waste heat recovery project at an individual customer building. Will the team from City select the specific building or is the consultant expected to select based on a criterion provided by the city?

A9. The consultant is expected to develop a checklist of criteria that helps inform City staff to select specific heat recovery and/or cooling equipment that is compatible with Surrey's district energy system. The building archetype could be a potential criterion. Or the consultant could develop a criteria for each building archetype.

Q10. Page 14: Identify 3 scenarios for integration of cooling and waste heat recovery with the City's DE system based on an assumed building archetype. Will the City select the archetypes and specific building parameters?

A10. Refer to response in A5.

Q11. In view of the complexity of the response required for this RFP, will the City kindly extend the deadline and provide 2 additional weeks to respond?

A11. The City will extend the RFP deadline to October 13, 2020 at 3:00 P.M. (Local Time)

Q12. According to RFP Schedule A Section 3.5 (project assumptions), the City will provide information on typical building archetypes that are expected to connect to DE within the next 5-10 years. Is it possible to provide the list and their floor area of these building archetypes at the proposal stage?

A12. Below are examples of floor areas of typical building archetypes in Surrey's City Centre:

Building Type	Floor Area
Residential high-rise tower	22,000 m ²
Commercial building with office and retail space	12,000 m ²
Mixed use hotel and residential tower	40,000 m ²
Office building that includes a data centre	15,000 m ²

Q13. Will the proposal evaluation team be made up of the City personnel or will the team be a combination of the City and BC Hydro personnel?

A13. As a clarification, the evaluation team will be made of City personnel only, not BC Hydro members. Once the consultant team is hired by the City, the consultant teams will meet with BC Hydro to discuss reporting requirements for this study under the Low Carbon Electrification ("LCE") program. This Waste Heat Recovery study aligns with BC Hydro's LCE program – however there may be specific information that needs to be reported to satisfy BC Hydro's reporting requirements. The City anticipates that the consultants are required to complete the reporting requirements for LCE program in order to accomplish the tasks outlined in the RFP's Scope of Services. Proponents should budget some time to meet the LCE program deliverables.

Q14. Addendum No. 1 issued by the City emphasizes on the BC Hydro's Low Carbon Electrification (LCE) program. Is the "Waste Heat Recovery Study for Surrey City Energy" driven by the City or both City and BC Hydro?

A14. The study is driven by the City. The City has received conditional funding from BC Hydro under Low Carbon Electrification ("LCE") program to explore electrification options to reduce greenhouse gas emissions for the district energy system. The study will proceed regardless of whether BC Hydro funds this study.

A15. According to RFP Section 2.2 (Information Meeting), an information meeting may be hosted by the City Representative to discuss the City's requirements under this RFP. Is this meeting already scheduled?

A15. There was no Information Meeting.

Q16. According to Addendum No. 1, once the City awards the consultant(s), the Alliance member firm is expected to submit a proposal on low carbon electrification opportunities, study results, and report summary to BC Hydro. What is the expected start date of the Waste Heat Recovery study?

A16. The expected start date of the study is when the City selects the successful proponent, approximately in mid-October 2020.

Q17. The wording in article 3.1 on page 13 of the RFP (which requires heating and cooling demand profiles on daily, monthly, and annual bases) suggests that the proponent must provide energy modeling services. Indeed, we feel that modeling the archetype buildings is the only way to provide useful data that can comprehensively answer the technical questions posed as part of this study. Please confirm if the proponent is intended to provide energy modeling services. Would the City accept 4 generic models (1 for each archetype) with inputs provided by the City?

A17. The City does not expect the consultants to prepare detailed energy modelling for the purpose of the study. Rather, we would rely on consultants to use their expertise from previously modelled building archetypes to develop generic heating and cooling demand profiles for the four building archetypes.

Q18. Is the City open to extending the submission timeline by an additional two weeks?

Q18. Refer to response in A11.

Q19. According to RFP Schedule A Section 3.3 (Financial Analysis) and Section 8 (iv) (Project Deliverables), Class C cost estimates are requested by the City. EGBC Class C definition and requirements differ from those by the Canadian Institute of Quantity Surveyors. Could the City provide the expected cost estimation range and document completion percentages for the scope of this study? Does the City want Class C estimates at this stage of the project, or does the City want to conduct a conceptual assessment study to identify the waste heat recovery technology and its potential with order of magnitude costs? Is there any flexibility in the project budget mentioned in RFP Schedule A Section 11?

A19. Please refer to the table below for the City's guidance on accuracy thresholds for design projects. Class C estimates have an accuracy threshold of +/- 25-40%.

- The accuracy of estimates is based on the progression of designs and summarized in the table below:

Design progression	Class	Accuracy
Preliminary Design	Class C	+/- 25 -40%
Detailed Design at 70-90%	Class B	+/- 15 -25%
Detailed Design at 100%/IFT	Class A	+/- 10 -15%

Q20. P&IDs are mentioned as one of the project deliverables in the RFP Schedule A and Section 8 (v) (Project Deliverables). Does the City want the proponent to develop schematics or P&IDs at this stage of the project?

A20. As a clarification, the proponents do not need to develop P&IDs. It would be more valuable for the consultants to develop schematics that provide details on the sequence of operations of the equipment.

(REVISED) SCHEDULE A - SCOPE OF SERVICES

PROJECT TITLE: Waste Heat Recovery for Surrey City Energy

The City of Surrey is inviting Proponents to submit Proposals to assess various technical and policy options to address the growing requirement for cooling in buildings while optimizing opportunities to use waste-heat from cooling as a source of low-carbon energy for heating of buildings connected to its district energy system.

1. Project Background

The City of Surrey owns and operates Surrey City Energy (SCE), a district energy (DE) system in the rapidly growing City Centre area. The continued expansion of DE in City Centre provides an opportunity for the City to realize a community scale reduction in greenhouse gas (GHG) emissions from buildings through the application of low-carbon energy.

SCE currently provides heating services only but requests are often received from developers for SCE to consider providing cooling services as well. Several trends are leading to an increased level of interest in this option. These include greater level of consumer demand for cooling in buildings for thermal comfort and a growing interest from mechanical designers to use heat pump technology to meet increasing building energy efficiency requirements.

The purpose of this project is to study the opportunity for Surrey City Energy to integrate onsite cooling services and/or waste heat recovery within buildings connected to the DE network. Many buildings that operate cooling systems employ chiller-cooling tower systems and much of the waste-heat is rejected to the atmosphere. This low-grade waste heat can either be used onsite within the individual building or redirected to the DE network to supplement the heat provided to neighbouring buildings. The outcome of the study will provide the City with a framework to evaluate the scale of opportunity to provide onsite cooling services and integrate waste-heat as a low-carbon heat source within the City's district energy network. The study will evaluate the potential energy recovered from specific building archetypes, assess technical constraints of heat recovery integration with the DE system, and provide recommendations on ownership models to inform financial aspects of SCE's capital planning and rate structures for its customers.

2. Project Objectives

The objectives of this project are to evaluate the scale of opportunity for SCE to provide onsite cooling services and integrate waste heat recovery into the district energy network; to evaluate technology and ownership options; and identify policy considerations to advance the City's objectives of:

1. Optimizing the recovery of waste heat as a source of low carbon energy to offset natural gas consumption on the district energy network;
2. Meeting the demand for cooling in new buildings in a manner that is compliant with the City's District Energy Bylaw and is cost-effective to developers and end-users

3. Project Activities – IN SCOPE

o General

- o Review previously completed background studies regarding City of Surrey DE system.
- o Work with City staff to gain an understanding of the operating parameters and long term objectives of the City of Surrey DE system.
- o Identify a framework and criteria for assessing the viability of waste-heat recovery based on building archetypes and technical constraints of the DE network.
- o Calculate the costs for the City to integrate waste heat recovery from buildings with the district energy system.

- Evaluate policy options that would increase adoption of DE-compatible waste heat recovery technologies.

1. Building Archetypes

- Provide a summary of typical heating and cooling demand profiles (daily, monthly, annually) of future buildings in Surrey including both peak demand (in KW) and consumption (in KWh) for 4 different building archetypes which may include the following uses:
 - Residential high-rise tower
 - Commercial building with office and retail space
 - Mixed use hotel and residential tower
 - Data Centre

Note: Future heating and cooling demand profiles should include consideration of the impacts of climate change. **The City does not expect the consultants to prepare detailed energy modelling for the purpose of the study. Rather, consultants should use their expertise from previously modelled building archetypes to develop generic heating and cooling demand profiles for the four building archetypes.**

- Provide a summary of the cooling technology options that are typically installed within each building archetype
- Provide background information including energy and electricity inputs and COP of typical cooling systems and highlight opportunities to recover waste-heat
- Quantify waste-heat recovery potential based on future build-out of developments that will be connected to Surrey's DE system (projected building floor area and use type to be provided by City staff)

Meeting #1 – Discuss with the City on the three (3) scenarios to proceed in scenarios described in Section 2 (Technical Evaluation) and Section 3 (Financial Analysis). Each scenario considers one building archetype.

2. Technical Evaluation Cooling/Waste Heat Recovery Options

- Review DE system operating parameters with City staff and identify opportunities for waste heat recovery to either be used to offset heating inputs at the individual customer buildings or through the DE distribution network
- Evaluate technical considerations and constraints of integrating waste-heat recovery with the DE network which may include:
 - Capacity to accept waste heat as a function of temperature and flow (integrate results from Surrey's hydraulic model)
 - Proximity to existing heating plants (evaluate implications on plant efficiency and operations based on where waste-heat is injected along the distribution pipe system)
 - Seasonal supply and return temperatures
- Identify and illustrate typical equipment configurations of onsite cooling systems that are compatible with the City's DE system.
- Develop a checklist of criteria to evaluate the viability of a waste heat recovery project at an individual customer building.
- Identify 3 scenarios for integration of cooling and waste heat recovery with the City's DE system **based on an assumed building archetype.**
- Develop simple schematics **for each of the 3 scenarios** of waste-heat recovery configurations in each scenario that detail equipment layout and basic operating parameters (e.g. supply

and return temperatures, basic control logic, etc.). Identify tie-in points to the City's DE system, optimal locations for ownership boundaries and requirements for space and location within the building.

- In scenarios identified above, identify and quantify other benefits that can be achieved through waste heat recovery, including:
 - Natural gas reduction as a result of low carbon electrification;
 - GHG reduction;
 - Reduction in space requirement within building (e.g. reduction or elimination of cooling towers);
 - Reduction in potable water demand;
 - Reduction in electricity consumption for building; and
 - Any others.

3. Financial Analysis

- Complete Class C cost estimates for each of the 3 scenarios identified in Meeting #1 for equipment required. Class C cost estimates are +/-25% - 45% accuracy.
- Establish operating cost estimate (include staff and maintenance related costs).
- Identify and compare various ownership models amongst stakeholders which may include SCE, developers, strata corporations, 3rd party utility. Develop a matrix including considerations, risks, benefits, and drawbacks to each option. Evaluate the impacts to stakeholders in terms of operational and financial implications.

4. Policy Considerations

- Research various policies applied in other jurisdictions for integrating cooling and waste heat within medium temperature heating systems.
- Develop policy options for consideration within Surrey's existing DE bylaw that allow for the provision of waste-heat recovery and/or cooling services to help achieve the project objectives.

4. Project Completion Statement

District Energy Utility management will be able to provide clear options to the development industry on additional services that Surrey City Energy can provide related to cooling services and/or accepting waste-heat from new buildings. Decision criteria will be based on the alignment of the design with City of Surrey sustainability strategies and cost-effectiveness.

5. Project Assumptions

- Projected growth in development is based on the Expected Growth Scenario as defined by the requirements in Surrey City Centre Plan
- The City will provide information on typical building archetypes that are expected to connect to DE within the next 5-10 years. Available information including floor plans, site location, and building use types will be provided to the Consultant. Any missing information required to calculate cooling/heating loads on buildings will be researched by the Consultant.

6. Project Constraints

- This study is intended to focus on building-scale technologies and not to evaluate the feasibility of a district cooling network.

7. Stakeholders

- City of Surrey Staff
- Other district energy utilities in the Lower Mainland (to be consulted on various phases of the project for technical input)

The City is applying for funding opportunities with BC Hydro and the Federation of Canadian Municipalities (FCM). If the City is successful, the consultant may be required to participate in meetings with the funding partners to discuss study outcomes and incorporate funding program requirements in interim and/or final reports. The initiatives and requirements are described below:

- BC Hydro's Low-Carbon Electrification (LCE) opportunity: The aim of the funding is to identify opportunities for LCE and advance implementation projects. The consulting firm is required to submit a proposal to BC Hydro that identifies LCE opportunities and evaluates the cost benefits of each measure. Examples of LCE measure include domestic hot water chillers, HVAC heat pumps, etc.
- Federation of Canadian Municipalities' Green Municipal Fund – Study recovery in district energy: The initiative aims to reduce fossil fuel use by 40% compared to current performance. Consultant is required to demonstrate 40% reduction in natural gas or GHG emissions at the building level.

8. Project Deliverables

- I. Kick-off meeting to confirm scope of work, assumptions, data sources, contacts, work plan, etc.
- II. Draft reports for each phase (described in Project Activities section)
- III. Technical meeting to review draft reports and discuss results with stakeholders for the following phases:
 - Meeting #1 - Building Archetypes
 - Meeting #2 – Technical Evaluation on District Energy Interconnection for Cooling/Waste Heat Recovery Options
 - Meeting #3 – Financial Model Analysis
 - Meeting #4 – Policy Considerations
- IV. Class C cost estimates for waste heat recovery equipment
- V. **P&ID and Generic** schematics of waste heat and/or cooling equipment configurations
- VI. Final report.
- VII. Other interactions as necessary to ensure the study objectives will be met.

9. Schedule

Consultant is required to submit a timeline for submission of key project deliverables. The project should be completed and Final Report **submitted by March 31, 2021.**

10. Consulting Team Qualifications

The successful consulting team will include expertise and experience in mechanical and electrical engineering; green building policy; and utility finance and regulation. The proposed consulting team should demonstrate expertise in:

- A. HVAC mechanical systems of large residential and mixed-use buildings (preference for consulting firm to be a member of the BC Hydro Alliance of Energy Professionals);
- B. Design and operation of medium temperature district energy systems;

- C. Cost estimating of relevant mechanical/electrical equipment; and
- D. Utility ownership and regulatory models for District Energy Systems.

11. Budget

The project budget is \$100,000.

All Addenda will become part of the Contract Documents.

- END OF ADDENDUM -