Request for Information on Building Energy:

Mapping and Analytics for Residential Energy Use and Efficiency Concept Development Study

RFI Issuance Date: February 25, 2020

Response Due Date: April 3, 2020

The Open Geospatial Consortium (OGC®)

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Executive Summary

The Open Geospatial Consortium (OGC) and Natural Resources Canada (NRCan) are requesting information to support a concept development study on building energy mapping and analytics. The information being sought includes who undertakes this work, what data they use, what building archetypes they make use of, how they develop and/or operate their models, and how the resulting analyses, maps, and applications could be or are being used.

Mapping and analysis of the energy consumption of buildings is currently undertaken in Canada by local municipalities, energy utilities, and federal agencies independently and for various purposes and across different scales. These groups derive energy usage using many different sources and methods, yet fundamentally the data are the same: understanding of the building stock–the numbers, floor areas, and other characteristics of various building archetypes and how they impact energy usage. Despite this commonality, there is little to no coordination between these groups, resulting in differing methodologies, duplication of effort, lost energy savings, and lost opportunities for climate change mitigation and resilience.

The Building Energy Mapping and Analytics CDS is addressing this challenge by undertaking to:

- Characterize the state of development of energy mapping and analytics for building stock broadly; and
- Inform and propose IT architectural practices and standards to enable mapping and analytics specifically of residential energy use and efficiency.

This RFI document poses a variety of questions on building energy mapping and analysis from stakeholder roles to data sources and technology adoption. OGC and NRCan wish to hear from a wide range of respondents, including those from:

- Municipalities
- Provinces/states (or equivalent sub-national entities)
- Federal/National governments
- Regulatory body
- University labs
- Consultants including geomatics, engineering, planning and design firms
- Academic Institutions including labs
- Utilities
- Federal or Territorial / Provincial / State Policy Organizations
- Non-governmental or charitable organization Enabling organizations supporting energy mapping and smart energy communities more broadly Canadian example is the Federation of Canadian Municipalities)
- Advocacy groups

Responses to this request for information will be validated in a subsequent face-to-face workshop in Ottawa, Canada in early May 2020. Results will be compiled in a study report for public release to be presented in two webinars (English and French) as well as in person at the OGC Technical Committee meeting in Montreal in June, 2020. Respondents are welcome to attend the workshop in Ottawa or the meeting in Montreal but are not required to do so..

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1. Introduction

This Request for Information (RFI) is part of an OGC Innovation Program Project entitled "Building Energy Mapping and Analytics Concept Development Study (BEMA-CDS)". The initiative is sponsored by the Canadian federal government department of Natural Resources Canada.

1.1. RFI purpose and scope

The purpose of this RFI and the BEMA-CDS more broadly is to gather information and viewpoints from a wide array of respondents to develop a standards-based approach to building energy end-use and efficiency opportunities mapping. Building energy mapping and analytics is seen as important for geo-targeting energy policies, programs, codes, incentives, and technology integration to accelerate the transition to a low-carbon built environment and economy.

The scope of the CDS includes:

- Characterizing the state of development of energy mapping and analytics in the building stock broadly; and
- Inform and propose IT architectural practices and standards to enable mapping and analytics of residential energy use and efficiency specifically.

RFI responses will be validated in a subsequent face-to-face workshop in Ottawa in May, 2020. Responses will be compiled in a study report for public release to be presented in two webinars (English and French) as well as in person at the OGC Technical Committee meeting in Montreal in June, 2020. The CDS results will serve to inform future OGC innovation program and standards development activities, as well as assist NRCan in carrying forward research and development (R&D) activities in the domain.

1.2. Organizations supporting this RFI

Natural Resources Canada (NRCan) (Sponsor) seeks to enhance the responsible development and use of Canada's natural resources and the competitiveness of Canada's natural resources products. Two groups within NRCan are providing support to the BEMA-CDS:

- GeoConnections: GeoConnections is a national program with the mandate and responsibility to lead the Canadian Geospatial Data Infrastructure (CGDI). The program focuses on advancing standards-based technologies and operational policies for data sharing and integration in order to advance the CGDI.

- CanmetENERGY-Ottawa: CanmetENERGY in Ottawa engages in research and development in the areas of energy efficiency, clean fossil fuels, and renewable and alternative energy sources. CanmetENERGY-Ottawa leads the development of energy science and technology solutions for the environmental and economic benefit of Canadians.

The Open Geospatial Consortium (OGC) is an international consortium of more than 500 companies, government agencies, research organizations, and universities participating in a consensus process to develop publicly available geospatial standards.

2. Background

Natural Resources Canada-CanmetENERGY-Ottawa (NRCan-CE-O) is leading a research activity called the Canadian Energy End-use Mapping (CEE Map) project. Funded by the Program of Energy Research and Development (PERD), NRCan's Innovation Fund and the GeoConnections Program, the CEE Map project plans to develop an online interactive mapping solution that will expose housing energy use and efficiency opportunities data to non-building science professionals, in a usable map format. Priority policy and program applications include municipal housing energy retrofit strategies and utility Demand Side Management (DSM) along transmission and distribution (T&D) lines. It also seeks to deploy authoritative buildings and energy data, standards and technical guidance to enable building energy mapping by other organizations.

The Concept Development Study will scope the current state of development of energy mapping and analytics in the building stock as a whole for both end-use and renewables as they apply directly to buildings; the focus for the development of the architecture will focus on the residential housing stock specifically.

The CEE Map project builds upon and advances past NRCan-CE-O research on energy mapping and building-archetype applications. Experience gained, partnerships developed, and IP generated in other projects (eg. Integrated Community Energy Mapping (ICEM), which includes the Spatial Community Energy, Carbon and. Cost Characterization Model (SCEC3) model and Tract and Neighbourhood Data Modelling (TaNDM) methodology) can inform both the CEE Map project and OGC CDS.

Additionally, NRCan-CE-O is developing housing and building reference archetypes using the Housing and Building Technology Assessment Platforms (HTAP and BTAP). These platforms generate housing and building modelled energy data, for new and vintage archetypes, for all weather regions across Canada for baseline and future scenarios. Work is at present being done with HTAP and BTAP to support the National Building Code of Canada. HTAP and BTAP archetypes and associated datasets will be deployed over the next few years. They are also being leveraged for research purposes in the CEE Map Project. In future, work to combine results from HTAP and BTAP into mapping platforms may also inform the development of alteration / retrofit codes applying to the existing building stock.

Other projects presently underway at NRCan-CE-O include the Low Carbon Community Energy Systems (LCCES) project, which is receptor-driven and focused on R&D for existing communities to support stakeholder needs. It consists of three components: 1. Advanced Technology Development 2. Stakeholder engagement 3. LCCES process development. Ultimately the LCCES project and low carbon community energy technology deployment will benefit from a baseline understanding of building energy use and efficiency opportunities to facilitate strategic technology integration.

NRCan-CE-O is also undertaking renewables resource assessment mapping in the areas of wind, solar, the arctic and hydrokinetic. NRCan CanmetENERGY-Varennes (NRCan-CE-V) is undertaking mapping research to characterize the potential for Building Integrated Photovoltaics (BIPV) and Building Integrated Photovoltaics and Thermal (BIPV-T).

Concurrently, NRCan's Canada Centre for Mapping and Earth Observation (NRCan-CCMEO) is working with Statistics Canada to develop a National Building Layer (NBL). Requirements for building attributes related to energy mapping and modelling have been provided to the National Building Layer initiative to develop the data model and potential attributes for the NBL, the development of which will be piloted in Kelowna, BC. The intent is to deploy building energy mapping in Canada nationally when the NBL becomes available as a base data layer for buildings.

Various Government of Canada priorities, initiatives and reports to which the CEE Map Project and the BEMA-CDS respond include:

- Community Energy Planning in Canada the Value of Energy Mapping Symposium
- Combining Our Energies
- Pan-Canadian Framework on Climate Change
- A Data Strategy Roadmap for the Federal Public Service
- Rethinking Canada's energy information system: collaborative models in a data-driven economy
- Reducing greenhouse gas emissions from Canada's built environment
- Building Canada's Energy Future Together
- Generation Energy Council Report
- Federal Geospatial Platform/Open Maps
- Canadian Energy Information Portal

Related supporting non-governmental reports that provide background and justification for the BEMA-CDS include:

- Status Report on Community Energy Plan Implementation: A Follow up to the National Report on Community Energy Plan Implementation September 2017

- The Atlantic Canada Energy Data Roadmap

3. Building Energy Mapping and Analytics Concept Development Study

The BEMA-CDS will identify stakeholders, critical concepts, relevant models, and analytical methods based on geospatial data to understand the current practices and promising future directions for building energy mapping and analytics.

3.1. Concept and Motivation

Over 400 Canadian municipalities have completed community energy and emissions plans for which they acquire data and conduct or procure modelling. Electric and natural gas utilities procure Conservation Potential Reviews (CPR) and establish Demand Side Management (DSM) programs to achieve energy conservation and efficiency targets. Nationally, Canadian federal government departments conduct surveys and building energy modelling to inform policy and program development, changes to equipment standards and energy performance requirements in the National Building Code of Canada.

Energy usage is derived from different sources and methods including measured energy data, modelled data; various statistical and aggregation techniques are applied inconsistently by different organizations to estimate current and projected end-use and efficiency opportunities. Although data are used by municipal, utility and federal government policies, programs and planning processes at different spatio-temporal resolutions, at a fundamental level, the data is essentially the same. What is required for all of these processes is an understanding of the building stock: the relevant characteristics of various building archetypes and their associated energy usage impacts.

Strategic policy, planning and program efforts of municipalities, utilities and federal policy, program, codes and standards that govern these processes are not, however, harmonized in terms of how to incorporate data, characterize the building stock, and evaluate energy usage efficiency opportunities. The lack of geospatial data coordination in particular results in duplication of effort, lost energy savings and lost opportunities for climate change mitigation and resilience. Access to and use of consistent, authoritative geospatial data on the building stock and its energy performance is a systemic challenge that no one organization can fix alone.

3.2. RFI Objectives

This RFI solicits responses from a wide audience to specific questions in eight subject categories concerning the building energy mapping and analytics domain. RFI responses will form the principal basis for subsequent Concept Development Study activities, such as a validation workshop, results webinars, and a final report released publicly through the OGC Technical Committee.

3.3. Applications and Benefits

An OGC Concept Development Study relies on RFI responses and other inputs to develop and communicate an understanding of the principal geospatial data sharing and interoperability challenges and opportunities in a particular domain. As the usage scenarios described below make clear, there are opportunities for realizing the benefits of enhanced data sharing for building energy mapping and analysis, enhanced roles for geographic factors in this work, improved comparability between different workflows based on common data and practices, and improved applicability to the evaluation of programs and policies for increasing efficiency, conservation and renewable energy technology integration.

3.4. Usage Scenarios for Building Energy Mapping and Analytics

Three principal usage scenarios for building energy mapping and analytics have been chosen to motivate the questions posed in this RFI. Other usage scenarios may also be relevant now or in the future.

3.4.1. Community Energy and Emissions Planning

Community energy managers tasked with developing policies and programs to achieve improved energy performance in new and existing buildings have diverse backgrounds. Knowledge of building science and efficiency and renewable energy measures for buildings varies amongst practitioners. They require but may not have ready access to data on building archetypes, their energy-related attributes, and the distribution of those archetypes in the stock. They need baseline and future scenario analysis to support evaluation of various conservation and technology measures that can be incentivized for deployment in new construction and/or as retrofits to existing buildings. For measures that are to be prioritized in the context of integrated resource planning, community energy managers need to know where to deploy them and how much they will cost , as well as a general projection of the estimated energy, GHG emissions and operating energy cost savings at local and community scales.

3.4.2. Utility Conservation Potential Review & Demand Side Management Program Planning

Program managers in utilities seek to understand the contribution of conservation and efficiency measures to utility demand and load requirements over time and across their service areas. This supports generation capacity planning, the planning and evaluation of Demand Side Management (DSM) programs and infrastructure renewal. Traditional DSM programs have focused on mass-market technology-specific measures such as changing light bulbs, removing old fridges or installing higher-efficiency furnaces. These individual measures are achieving fewer savings over time and miss the more significant energy savings that could be realized, for example, through combining multiple conservation measures into building retrofits. Another consideration is that the migration from large centralized fossil fuel and nuclear power generation to distributed and/or community scale low carbon energy generation may also significantly impact utility transmission and distribution infrastructure.

Utilities use geospatial analysis to inform asset management and right of way planning; however, it is thought that utilities often do not have the practice of using geospatial analytics to inform DSM program planning. With access to geospatially enabled, archetype-specific modelled energy data for baselines and scenarios, it is possible that additional value can be derived from DSM programs in offsetting capital costs for new transmission infrastructure through load reductions realized from conservation and efficiency measures.

3.4.3. Federal/Provincial/Territorial/State Building Energy Policy Programs, Standards, Building Codes

Government officials involved in policy, program, standards and construction code development relating to buildings require information on distinct housing or building types, also known as archetypes, to evaluate energy performance for a specific technology or assembly measure. This information informs the development of new or improved programs and policies, and establishes improved performance measures for inclusion in equipment standards or building codes. Data for these stakeholders is currently drawn from surveys, and housing and building simulations. Non-spatial stock analysis is performed by extrapolating results to larger geographies based on total number of dwellings thought to correspond to a given archetype. Limitations of these methods include limited survey sample sizes, and restricted applicability of both surveys and archetypes in smaller geographic areas. It may be challenging to derive meaningful results for emerging bottom-up use cases given these limitations.

4. RFI Response Outline

Responses to this RFI should take the form of answers to questions in one or more of the following categories.

Importantly, please indicate if you previously responded to the IEA EBC Annex 70 Survey on Building Stock Data Uses and Needs, or, more recently, the review of building energy mapping applications/models conducted by the Posterity Group on behalf of NRCan

CanmetENERGY-Ottawa. Information provided in those other studies does not need to be repeated here.

4.1. Stakeholders

4.1.1. What is your name, position, and how can we contact you?

4.1.2. What is the name of the primary organization with which you're affiliated?

4.1.3. Which of the following categories best describes your organization?

- Municipalities
- Provinces/states (or equivalent sub-national entities)
- Federal/National governments
- Regulatory body
- Consultants including geomatics, engineering, planning and design firms
- Academic institutions including labs
- Utilities
- Federal or Territorial / Provincial / State Policy Organizations
- Non-governmental and/or charitable organization
- Advocacy group

4.1.4. Where does your organization operate (province, territory, state)?

4.1.5. Is your primary professional role within your organization as a:

- Data provider or owner;
- (Geospatial) data user;
- Data access enabler;
- End user of maps or analytics;
- Decision or policy maker;
- Application developer; or
- Other (please state)?

4.1.6. What key stakeholders do you interact with in regard to building energy mapping and analytics, and what are their roles?

4.2. Applications and IT Architecture

Please note: In this section, questions 4.2.5, 4.2.6 and 4.2.7 are comparable to those posed in the review of building energy mapping models conducted by the Posterity Group on behalf of NRCan in 2019/2020. Skip these questions if your responses were provided to that study.

4.2.1. In your professional role, do you develop or use building energy mapping and analytics applications yourself? Please describe the application capabilities and if possible provide an example or link.

4.2.2. If so, are they mainly used:
- Within your own organization; or
- For external organizations?

4.2.3. How are the applications you develop or use mainly applied, e.g.?
- Stakeholder engagement
- Planning
- Education
- Marketing
- Pre-feasibility assessment
- Benchmarking
- Technology integration potential assessment
- Policy and program impact assessment
- Other

4.2.4. What is the business model of the applications you develop or use?
- Free
- Paid by contract
- Subscription based
- Developed through a research collaboration with in-kind support
- Hybrid?

4.2.5. What software platforms are used by the buildings energy mapping and analytics application you develop or use?

4.2.6. What building types or archetypes are represented in the building energy mapping and analytics applications you develop or use; how many archetypes are used and how are they selected and classified?

4.2.7. How do the building energy mapping and analytics applications you develop or use handle building energy characterization and at what spatial or temporal scales?
- With measured utility data
- With modelling data on an archetype basis
- By modelling individual buildings
- Other: please describe

4.2.8. Thinking about your process, is your building energy mapping and analytics work performed only locally within your organization, or are there distributed computing components / workflows associated with it, or both? Or is it outsourced in whole or in part?

4.2.9. Are there specific data interchange interfaces or formats that your work relies on and what data standards or IT architectural patterns are they based on?

4.2.10. If national energy end-use data and maps were available, how would they be useful in the context of your process and the applications you develop or use?

4.3. Data and Data Governance

Please note: Question 4.3.1 is comparable to one posed in IEA EBC Annex 70 Survey on Energy and Building Stock Data, Uses and Needs. Skip question 4.3.1 if you responded to that survey.

4.3.1. What datasets are required for the building energy mapping and analytics applications that you develop or use? If applicable, at what spatial or temporal resolution are these obtained? Where are they sourced from? In what formats are they obtained? Please use the data types listed below in your response. Include any additional datasets used not listed below.

Physical Systems	**Energy Data**	**Environmental Data & Land Use**	**Other**
Building form typology	Energy use, all fuels	Weather data (e.g. temperature, relative humidity, wind speed)	Occupant socio-demographic s
Building age	Energy use demand and peak	Renewable energy resource data (e.g. solar radiation and insolation etc..)	Occupancy
Floor area	Building energy performance rating	Location data (e.g. X,Y, postal code, city, state or province)	Ownership
Envelope materials	Billing data	Indoor environmental data (e.g. temp, relative humidity, C02)	Occupant comfort
Heating, cooling, ventilation, storage systems	Price or tariff	Spatial plan, zoning and density	Construction costs
Renewable technologies	Carbon intensity of fuel, including electricity	Planning legislation and building codes	System upgrade/ refurbishment costs
Utility infrastructure	Modelled energy		Operation and

(e.g. transmission and distribution lines)	data (e.g. energy conservation measures)		maintenance costs

4.3.2. How do you evaluate the quality and fitness-for-purpose of datasets used, and how do you propagate this through your analytical procedures to instill confidence in the outputs?

4.3.3. What main datasets, attributes or coverage, are missing, inaccessible, undocumented, or not presently fit for purpose (e.g. scale, format, quality) whose use could improve the coverage and/or quality of building energy mapping and analytics analysis? What are the barriers to access? E.g. cost, technical expertise, privacy constraints, etc.

4.3.4. What standards apply to the datasets you employ, and where are standards inadequate or unavailable to support needed interoperability and data sharing?

4.3.5. Are you familiar with OGC standards? Yes / No

4.3.6. Do the datasets you work with leverage OGC standards, e.g.

- CityGML
- Energy ADE
- WMS
- IndoorGML
- Others

4.3.7. Does the building energy mapping and analytics application that you develop or use leverage big data; how do you define big data?

4.3.8. What computational methods if any are used for filtering and/or generalizing large datasets for more tractable integration and portrayal?

4.3.9. If you are a data provider, do you collect data and make it available? If so, in what formats or by what means would you be most able to share this information?

4.4. Requirements

4.4.1. What privacy and/or commercial confidentiality requirements or concerns are associated with the datasets you employ and/or the analytical results you generate?

4.4.2. What thresholds and/or aggregation/masking techniques are used in portrayal of energy data, in order to protect privacy and/or commercial confidentiality?

4.4.3. Are there any Indigenous Ownership, Control, Access and Possession (OCAP®) requirements associated with the datasets you employ and/or the analytical results you generate?

4.4.4. Are there any data rights requirements associated with the datasets you employ and/or the analytical results you generate?
4.4.5. Are there specific preparation, labelling or documentation issues with the datasets you employ?

4.5. Usage scenarios

4.5.1. Do the usage scenarios for building energy mapping presented in Section 3.4 of this document provide a fair representation of building energy mapping and analytics applications? If not, please describe how they could be improved.
4.5.2. Please describe any additional usage scenarios for building energy mapping and analytics applications that inform your work and interests.
4.5.3. What key performance indicators (KPI's) are of interest in your usage scenarios?

4.6. Operation and Organization

4.6.1. Do others in your organization directly use and develop building / building energy maps?
4.6.2. Do others in your organization use such maps developed by others?
4.6.3. Do the building energy applications you develop or use, access measured utility data through open data protocols (i.e., the Green Button standard) or by what other means do they access measured utility data?
4.6.4. Do the building energy applications you develop or use leverage transactions managed through Blockchain / distributed ledger technology?
4.6.5. How do the building energy mapping and analytics applications you develop or use streamline and automate the integration of results from building energy analysis to buildings in the stock?
4.6.6. What policy, organizational, and administrative challenges do you have that must be addressed to improve the adoption of building energy mapping and analytics for data-driven planning and decision making?
4.6.7. Are there unique geospatial data needs that need to be considered at various levels of operations (local, state, regional, tribal, national, international levels, and by various players (government, commercial, NGO, academia/research)?
4.6.8. Thinking about your usage scenarios, what temporal resolution is most appropriate for the outputs of the building energy mapping

applications you develop or use (e.g. annual, monthly, weekly, daily, hourly, sub-hourly)?

4.7. Technology and Techniques

4.7.1. How does the building energy mapping application you develop or use support assessment of energy efficiency technologies / policies / programs / projects, local energy systems (e.g. waste energy, district energy, combined heat and power), building-tied or grid-tied renewable energy technologies (e.g. solar PV, Wind, micro-hydro), and/or storage, in the building stock, and which technologies are supported?

4.7.2. Does the building energy application you develop or use enable future scenario analysis, and if so, how are future scenarios developed? If not, what capabilities or parameters would be useful for enabling future scenario analysis?

4.7.3. Does the building energy application that you develop or use, leverage Machine Learning / Artificial Intelligence and how is it employed?

4.7.4. Does the building energy application that you develop or use, leverage blockchain / distributed ledger technologies and for what purpose?

4.8. Other Factors

4.8.1. How is the issue of building types or other building data being maintained differently across different organizations reconciled in the building energy applications you develop or use, and how does this impact analysis results?

4.8.2. What other success factors or considerations do you see as needed to advance the value and reach of building energy mapping and analytics?

4.8.3. If you are familiar with OGC standards, which existing standards can be used to support the usage scenarios, and how?

4.8.4. If familiar with OGC standards, which standards need to be improved / extensions developed?

4.8.5. If familiar with OGC standards, which should be exercised in a pilot supporting the use case scenarios described / your use cases?

4.8.6. If familiar with geospatial data/computation, which of these model types are most useful: hierarchical scheme (e.g. to match energy information to different scales/boundary data), semantic scheme (e.g. to match building types/definitions, or electric and natural gas customer classes), relational scheme? Are these also useful as services?

5. Organizations issuing this RFI

Natural Resources Canada (NRCan) (Sponsor) seeks to enhance the responsible development and use of Canada's natural resources and the competitiveness of Canada's natural resources 6 products. We are an established leader in science and technology in the fields of energy, forests, and minerals and metals and use our expertise in earth sciences to build and maintain an up-to-date knowledge base of our landmass. NRCan develops policies and programs that enhance the contribution of the natural resources sector to the economy and improve the quality of life for all Canadians.

The Open Geospatial Consortium (OGC) is an international consortium of more than 500 companies, government agencies, research organizations, and universities participating in a consensus process to develop publicly available geospatial standards. OGC standards support interoperable solutions that "geo-enable" the Web, wireless and location-based services, and mainstream IT. OGC standards empower technology developers to make geospatial information and services accessible and useful with any application that needs to be geospatially enabled. OGC has planned and completed over 100 initiatives – testbeds, pilots, and experiments – designed to join the public and private sectors in hands on collaborative development, testing, prototyping and demonstration of enhanced or new interoperable, standards-based approaches. Recommendations from these initiatives become new or revised open standards and best practices which help to improve decision making, reduce the time and cost in mobilizing new capabilities, and to save lives and minimize the impact to property and the environment.

6. How to Respond to this RFI

6.1. Who can respond

Responses to this RFI are due by April 3, 2020 as listed in the Master Schedule (see Section 7). Responses will be distributed to members of the organizations listed in section 1. Submissions will remain in the control of this group and will be used for the purposes identified in this RFI. A summary of the RFI Responses may be made public. If you wish to submit proprietary information, contact (techdesk@opengeospatial.org) in advance of sending the response.

6.2. General terms and conditions

Send your response in electronic version to the OGC Technology Desk (techdesk@opengeospatial.org) by the submission deadline. Microsoft® Word format is preferred, however, Rich Text Format, or Adobe Portable Document Format® (PDF) are acceptable.

6.3. How to transmit a response

A response to this RFI shall respond to as many applicable aspects defined in section 5 as possible. No particular format is required, but any response should be structured in a way that allows understanding of the respondents' position on key aspects as listed in Section 6: stakeholders, architecture, data, scenarios & use cases, requirements & constraints, operation & organization, and applications & technologies. Respondents are free to add any additional topic as they think appropriate.

6.4. Questions and clarifications

Questions and requests for clarification should be sent to techdesk@opengeospatial.org.

Questions received as well as clarifications from the RFI developers will be posted publicly at the Building Energy Mapping and Analytics CDS web site:

https://www.opengeospatial.org/projects/initiatives/bdgenergycds

6.5. Reimbursement

The organizations issuing this RFI will not reimburse submitters for any costs incurred in connection with preparing responses to this RFI.

7. Master Schedule

Activity / Milestone	Date
RFI Issued	February 25, 2020
RFI Responses Due	April 3, 2020
Validation Workshop	May 7, 2020
Final Report	June, 2020
Final Presentation at Montreal TC	June 15-18, 2020

8. Glossary

Term	Definition
Big Data	Refers to datasets that are too large or complex to be dealt with by traditional data-processing application software, according to any or all of volume, velocity, variety, or veracity.
BTAP: Building Technology Assessment Platform	BTAP is a framework being developed by NRCan to assist in the analysis of the energy performance of technologies used in commercial buildings.
CDM: Conservation and Demand Management	Energy conservation and demand management consists of measures for conserving or otherwise reducing the amount of energy consumed and for managing consumer demand for energy, including a forecast of the expected results of current and proposed measures. (cf.f. O. Reg. 397/11, s. 4 (2).)

CDS: Concept Development Study	Early stage in the OGC process for developing new standards and interoperability practices
DSM: Demand Side Management	The modification of consumer demand for energy through various methods such as financial incentives and behavioral change through education (Wikipedia).
HTAP: Housing Technology Assessment Platform	HTAP is a collection of data and tools that automate and extend the HOT2000 residential energy simulation tool. The HOT2000 software suite can be obtained directly from Natural ResourcesCanada.
NBL: National Building Layer	National scale database of building footprints and other attributes for Canada, see also the Statistics Canada Open Database of Buildings.
OCAP®: Indigenous Ownership, Control, Access and Possession	https://fnigc.ca/ocap
RFI: Request for Information	A CDS stage of widely gathering information from knowledgeable stakeholders on geospatial interoperability and data sharing challenges in a new domain.
SCEC3 Model	The Spatial Community Energy Carbon and Cost Characterization (SCEC3) model was developed by NRCan's CanmetENERGY-Ottawa for the City of Prince George, BC between 2008 and 2012. It used housing and building simulation on an archetype basis to create a baseline and future scenario projections for the City's housing stock in support of GHG-related targets, policies and actions in the Official Community Plan.
TaNDM	The Tract and Neighbourhood Data Modelling (TaNDM) project was led by the province of BC and sponsored by NRCan in 2010-12 to improve the structure and level of geography of energy and emissions inventory data. It developed a new bottom-up method for aggregating buildings energy and emissions data by building type to a privacy-compliance threshold.