BCIT SoCE Factor Four Natural Gas Metering
Project Charter

1 Revision history table

Version Number	Version Date	Added By:	Revision Description
1	December 6th, 2012	John Wawrysh	First Draft
2	January 16th, 2013	John Wawrysh	Second Draft (comments from stakeholders added.)
3	January 17th, 2013	John Wawrysh	Revisions based on feedback from Alex and Joey, Clay, Eric and Jennie.
4	March 4th, 2013	Alexandre Hebert	General review
5	March 25th, 2013	Eric Hawthorn and Alexandre Hebert	Addition to Scope section and change to costing section

2 Intro

The Factor Four Project has the goal of realizing a fourfold decrease in material and energy throughput in buildings NE1-8 at the BCIT Burnaby Campus, without compromising service levels. This project charter is related to the energy piece of Factor Four. In order to reduce energy by 75%, a baseline of energy consumption for each building in the Factor Four Project must be developed. Real-time monitoring at the building level is also an asset for good energy management. This project builds on the previous Phase 1; "BCIT Factor Four Metering Project" that focused exclusively on electricity metering. Electricity represents only a portion of the energy consumption in the area.

NE1 is mainly heated with hot water delivered from the central plant but also has processes within the building that make use of natural gas (e.g.: kitchen equipment, rooftop units, etc.). A gas meter exists for NE1 but is not being monitored. The other Factor 4 buildings (NE2, NE3, NE4, NE6 and NE8) are currently on volumetric meters without the capability to read the meter remotely. As a result, the meters are read manually once a month. This does not allow for the ability to take advantage of real time monitoring and all associated benefits.

3 Problem/Opportunity Statement(s)

Problem:

You can't manage what you don't know. The Factor Four project aims at a 75% reductions and tracking of progress is impossible without meters that cover the buildings within the project boundaries. Currently, there is:

- no data tracking of natural gas consumption in NE1;
- no real-time/granular data for natural gas consumption in the hole of the Factor IV area.

Opportunity:

Adding natural gas smart metering will complete the picture of energy consumption in the Factor IV area. Knowing where and when all Factor Four energy is consumed is necessary to achieve a 75% reduction in consumption. Adding remote meter reading will allow for granular real time tracking of the natural gas and will complement electricity data.

Examples of such opportunities from such metering include:

- creating a baseline to track progress and measure success
- assigning a budget in order to drive change through cost accountability
- implementing behavioural change campaigns
- improve reporting granularity (internally, externally: SMARTtool)
- identifying high energy users (opportunities)
- benchmark and prioritize energy saving areas
- creating simple awareness and external exposure
- providing building operators alarms (could be added to job description - performance oriented)
- support full building continuous recommissionning
- alert facilities of maintenance problems before a small problem becomes bigger (e.g. poorly performing equipment or gas leaks)

4 Goal

The goal of this project is to have granular on-line accessible monitoring at the building level of the natural gas consumed in the Factor Four area.

5 Scope Inclusions and Exclusions

Included in Scope

The building(s) in-scope for this project charter is:

a. NE01
b. NE02
c. NE03 Centre for Architectural Ecology & AFRESH Home
d. NE04
e. NE06

This project will include the installation of 5 meters at the following gas meters in order to isolate the buildings mentioned above:

Retrofit or Meter Type	Location
ERG-5003-008 (Itron ERT 100G)	NE01 NG Meter (Inglis building)
ERG-5003-008 (Itron ERT 100G)	NE02 NG Meter (Joinery)
ERG-5003-008 (Itron ERT 100G)	NE03 NG Meter (Center for Architectural Ecology)
ERG-5003-008 (Itron ERT 100G)	NE04 NG Meter (Carpentry)
ERG-5003-008 (Itron ERT 100G)	NE06 NG Meter (Piping)

Tantalus provides Smart Grid communications solutions for advanced metering, demand response & distribution automation. Tantalus is currently involved with energy metering on the Burnaby campus and works in close partnership with the GAIT group. This relationship is mutually beneficial as the GAIT group benefits from Tantalus technology and technical support while Tantalus uses BCIT's facilities as a testing and proving ground for their technologies. Tantalus has arranged for Itron to donate the necessary Itron ERT 100G modules (ERG-5003-008) for the project. The ERG-5003-008 module is a retrofit module for the existing Rockwell natural gas meters on site. The ERT modules are compatible with the existing radio communication tower used as part of the Smart MicroGrid research infrastructure and will not require the installation of communication equipment other that the build-in device found inside the ERT 100G.

This project includes the integration of the meter data to the GAIT EMS system. Integration with EMS depends on Tantalus to provide working meter hardware, Tantalus server and data collection, access for GAIT to Tantalus server and meter data.

In more details, GAIT EMS integration effort includes:

a) Connecting the meters to the GAIT EMS system so that there is easily accessible granular data for the natural gas [i.e.: integration of GAIT EMS with Tantalus multi-speak data access interface];
b) Integration to the EMS so that all the features available to the Factor IV electrical meters are also available for the natural gas meters [i.e.: EMS metadata configuration for new devices and measurement types];
c) The user will be able to access separately the electrical (kWh), hot water (GJ) and natural gas (GJ) consumption for each building located in the Factor 4 area via an initial click on an online map of the area [i.e.: EMS user interface customization and extension].
d) Time permitting, but not a firm requirement, the user will be able to access separately, and/or to export total energy (GJ).
e) Final report summarizing EMS integration effort, including documenting any algorithms or other relevant technical information.

Not included in scope

Altering the gas meter for the welding shop (NE8) is out of scope for this project. Due to a lack of available technology, data output for NE8 will not be installed. Any changes to the NE8 meter would likely require a meter refurbishment or replacement. It is vital to more wide-ranging

projects to keep the calibration of the current meter. The baseline data for NE08 has been established using the current calibration and savings data will be calculated based upon this data and calibration. This meter will continue to be monitored manually every month.

All the works associated the hot water meter in NE1. It was agreed that this other work would be documented in a separate project charter.

GAIT is not responsible for installation, maintenance, or working order of meters.

GAIT is also not responsible for the RF connectivity of the Tantalus system (Tantalus to setup/configure/troubleshoot).

6 Costing and Responsibilities

ERT Retrofit

Item	Cost	Who	Lead Department	Mode of Payment
5 x ERG-5003-008:	Donated by Tantalus	Tantalus	GAIT	N/A
Integration to GAIT/Tantalus wireless network	No charge	GAIT/Tantalus	GAIT	N/A
Software to receive ERT pulse	Donated by Tantalus	Tantalus	GAIT	N/A
ERT Installation and permitting	$1,000	Adrian Lee	Facilities	Facilities will cross charge SoCE
Integration to EMS – Part 1	15-20 person-days	GAIT: Clay Howey and Eric Hawthorne	GAIT	GAIT keep track of time for internal purposes (no cross charge)
Contingency (+/- 10%)	$500	-	-	-
Total:	$1,500	-	-	-

7 Main Stakeholders to consider

a) School of Construction and the Environment Factor Four Project team members: Jennie Moore, Pal Moses, Alexandre Hebert.
b) The GAIT Group: Joey Dabell, Clay Howey, Eric Hawthorne, Alan Stewart.
c) The Facilities department: Adrian Lee, Marvin Rogers and any staff involved
d) Tantalus System Inc.: Keith R. Martin, Randy Aeberhardt and Kevin Hadden
e) External contractors for installation.

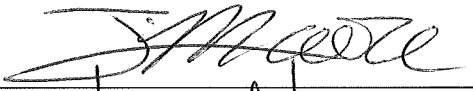
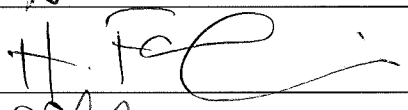
8 Deliverables by group

Refer to Section 5.
Icons for user interface, if required, will be provided by Alexandre Hebert.

9 Timeline

Equipment must be installed and paid for by March 31, 2013.
EMS Integration must be completed by July 31, 2013. This date depends on successful installation of Tantalus meters, successful meter data reporting, and GAIT access to Tantalus server and meters data. Delays to these will impact EMS Integration effort timeline.

10 Stakeholders Approval

Stakeholder	Name	Signature
School of Construction and the Environment	Jennie Moore	
School of Construction and the Environment	Alexandre Hebert	
GAIT Group	Hassan Farhangi	
Facilities department	Adrian Lee