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December 23, 2010

Ms. Erica M. Hamilton
Commission Secretary
British Columbia Utilities Commission
Sixth Floor – 900 Howe Street
Vancouver, BC V6Z 2N3

Dear Ms. Hamilton:

RE: British Columbia Utilities Commission (BCUC)
British Columbia Hydro and Power Authority (BC Hydro)
Smart Metering and Infrastructure (SMI) Program
Compliance with Directive 7 of BCUC Order No. G-67-10

BC Hydro encloses the SMI Program Business Plan, prepared for the purpose of reporting to the BCUC under Directive 7 of BCUC Order No. G-67-10.

This filing of the SMI Program Business Plan is not an application for acceptance or approval of planned expenditures.

BC Hydro will continue to provide quarterly updates on the SMI Program as required under Directive 6 of BCUC Order No. G-67-10.

For further information, please contact the undersigned.

Yours sincerely,

Joanna Sofield
Chief Regulatory Officer

cf/af

Enclosure (1)

Copy to: BCUC Project No. 3698500 (F09/F10 RRA) Registered Intervener Distribution List.
BCUC Project No. 3698592 (F11 RRA) Registered Intervener Distribution List.

Smart Metering & Infrastructure Program

BC hydro

Business Plan

December 2010

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Executive Summary

The purpose of this document is to provide an overview of the Smart Metering and Infrastructure (**SMI**) Program with a particular focus on the scope elements, organization, and approach to deliver on time and on budget.

The SMI Program mission is to successfully install a safe, reliable, and cost-efficient smart meter solution and other key infrastructure upgrades for greater operational efficiency, customer reliability, energy efficiency, and integration of new clean electricity sources. The goals towards this mission focus on providing operational efficiencies, enhancing the BC Hydro customer experience, and delivering social and environmental benefits.

British Columbia's *Clean Energy Act* (**CEA**) and the *Smart Meters and Smart Grid Regulation* requires the completion of the first three of the following SMI Program scope elements by the end of calendar year 2012.

- *Smart Metering System:* Smart meters – two-way communications-enabled meters that capture the amount of power consumed and when it occurred – plus metering telecommunications and an Automated Data Collection System.
- *Solution Integration:* The infrastructure to collect meter reading data and manage smart meters, as well as the interfaces and transformed business processes to support the organization's adaptation to the new technologies and systems.
- *Conservation Feedback Tools:* In-home display, secure web site, and time-of-use rates.
- *Advanced Theft Detection*: A combination of distribution system meters and theft analytics software to detect energy theft.
- *Grid Modernization Infrastructure Upgrades:* Advanced telecommunications infrastructure to support advanced electricity grid functions and emerging customer applications, and advanced operational support to support real-time operations of the metering system.

- *Program Delivery Activities:* Overall program delivery activities and services, including: Project Management and Controls; Security, Privacy, and Safety; Finance & Regulatory; Public Relations, Stakeholder Engagement, & Corporate Communications; and Contract Management.

In 2008, after a comprehensive formal procurement process, BC Hydro had short-listed to three Solution Integrators. Their final proposals were each beyond an acceptable price point, with BC Hydro retaining a substantial portion of risk.

BC Hydro reconsidered its position and concluded that the end-to-end approach was not in its best interests. BC Hydro instead proceeded with a 'disaggregated' approach, undertaking separate procurement processes to select the core components critical to the SMI Program. Moving to disaggregated procurement allows BC Hydro to exercise appropriate controls on the risks retained by BC Hydro, to ensure successful implementation of the SMI Program at an acceptable cost.

This revised approach focuses on four major procurement streams:

- Solution Integrator: Project management and systems integration work. The selected Solution Integrator is Capgemini Canada Inc. (**Capgemini**).
- Metering System: Smart meters, a field-based telecommunications system, and a 'head-end' software application that manages the system communications network and meter data collection processes.
- Meter Deployment Services: Meter installation and associated services such as supply chain management, work management integration, and deployment call centre services.
- Meter Data Management System (**MDMS**): Software application to manage meter data, with installation and configuration services.

The SMI Program's approach is designed to achieve effective execution. The SMI Program has been organized into Releases Ø through 6:

- Release Ø: Architectures and Execution Framework;
- Release 1: Mass Meter Deployment;

- Release 2: Billing from Register Reads;
- Release 3: In-Home Feedback;
- Release 4: Time-of-Use Rates and Billing from Interval Data;
- Release 5: Advanced Telecom and Operational Support; and
- Release 6: Advanced Theft Detection.

An organizational structure has been developed to facilitate delivery of the SMI Program. Key aspects include a Project Delivery Office, responsible for delivering the SMI Program on schedule and budget; a Security, Privacy and Safety Office; Technical Design and Delivery; Business Transformation and Operations; Deployment; Smart Metering & Network Operations; and business alignment leads for Theft Detection, In-Home Feedback, and Rates.

Delivery strategies have been developed for Solutions Integration – consisting of Systems Integration and Business Transformation & Operations – and Deployment. Systems Integration for the SMI Program takes a comprehensive approach that includes requirements, design, delivery, integrated testing, and environment management, as an iterative process for each of the releases. Business Transformation & Operations includes changes in processes, skills, policies, and/or volumes, conducted via collaborative meetings, facilitated workshops, and through strategies for training and transition to operations.

The deployment strategy leverages a combined field force of BC Hydro staff, contracted staff, and a Meter Deployment Services vendor strategically deployed throughout BC Hydro's service territory. The planned timeline from July 2011 through December 2012 requires a strategy that logically divides the deployment territory into operational areas of deployment crews and meter inventory to maximize installation throughput. Centralized support will be provided by the Deployment Controls Centre. A Customer Experience team aims to enable customer satisfaction and minimize customer impacts.

Safety considerations are at the forefront of planning and are integrated into:

- procurement;
- operation of equipment such as placement of equipment and designing new components;
- internal procedures such as standards work;
- meter installer training program; and
- mandatory safety requirements and qualifications for meter deployment proponents, including compliance with WorkSafe BC and the *Safety Standards Act*.

The SMI Program budget indicates that the cost for the Definition phase, expected to conclude by the end of the third quarter of fiscal year 2011, is estimated at $38.8 million. This brings expenditure to date, from the Initiation, Identification, and Definition phases, to $49.1 million. The Implementation phase (F2011 to F2014) forms the majority of the budget at $716.5 million. Contingency is $60 million and interest to be capitalized during construction is $14.4 million, bringing the Expected Amount to $840 million. The reserve subject to Board of Directors control is $90 million, resulting in an Authorized Amount of $930 million.

An executive level governance structure consisting of the BC Hydro Board of Directors, Executive Project Board, and Executive Operating Committee has been put in place to provide executive oversight of budget, scope, schedule, and issues.

1 Overview

1.1 Introduction

The purpose of this document is to provide an overview of the SMI Program with a particular focus on the scope elements, organization, and approach BC Hydro has developed to ensure the SMI Program is delivered on time and on budget.

The structure of this Business Plan is as follows:

Section 1 - SMI Program Objectives and Scope.

Section 2 - SMI Program Procurement Activities.

Section 3 - SMI Program Execution: including approach, integration, deployment and schedule.

Section 4 - SMI Program Expenditures.

Section 5 - SMI Program Governance.

Appendices A, B and C provide the SMI Program Schedule, Project Delivery Organizational Chart and Glossary, respectively.

1.1.1 Objectives

The SMI Program aims to successfully install a safe, reliable, and cost-efficient smart metering solution and other key infrastructure upgrades, to deliver operational efficiencies, enhance reliability for customers, provide customers with tools to use energy more efficiently, and help enable the integration of new clean sources of electricity.

Specific objectives are as follows:

- Provide Operational Efficiencies:
    - Improve reliability and lower operating costs in areas such as meter reading, distribution system maintenance, and outage management:

- Revenue Protection: Protect customers by reducing the impact of revenue loss from meter tampering and electricity theft directly from the distribution grid; and
- Deliver over $1.5 billion in benefits – with a net present value in excess of $500 million over a 20-year period.

- Enhance the BC Hydro Customer Experience:
  - Service Improvements: Provide customers with more up-to-date and informative bills, enable better outage communication and faster outage restoration times, and the option of timely information to help them use electricity more efficiently;
  - Advanced Applications: Provide a significant portion of the infrastructure platform required to modernize the grid to support advanced customer applications such as distributed generation, electric vehicles, micro-grids, and other future applications; and
  - Tools for Conservation and Energy Efficiency: Achieve energy and capacity savings by providing customers with incentives and tools, such as timely feedback and time-of-use rates, which provide direct control of energy use.
- Deliver Social & Environmental Benefits
  - Environment and Social Benefits: Improve employee and public safety and contribute to the reduction of greenhouse gas emissions in British Columbia;
  - Economic Growth and Innovation: Contribute to economic development and innovation in British Columbia through: employment opportunities associated with the deployment of smart meters; the creation of more information-based jobs; optimizing energy resources; and creating new opportunities for British Columbia-based businesses; and
  - Conservation Savings: Deliver capacity and energy savings.

1.2 Program Requirements

The elements of the SMI Program required by the end of calendar year 2012 as described in the *Smart Meters and Smart Grid Regulation* are as follows:

- Replacement of approximately 1.8 million meters with smart meters;
- Deployment of telecommunication systems required to transmit metering data;
- Implementation of infrastructure to support in-home feedback options including:
  - A web portal which displays previous day consumption data to customers via computer and mobile phone browsers;
  - An in-home display feedback device; and
- Implementation of supporting infrastructure for time-of-use rates.

Additional SMI Program work will continue beyond 2012 and is required by the *Smart Meters and Smart Grid Regulation* to be completed by end of calendar year 2015:

- Deployment of field devices and information technology in support of energy theft detection; and
- Advanced telecommunications.

1.3 Program Scope

The SMI Program is comprised of the following components:

1.3.1 Smart Metering System

Included as part of the Smart Metering System are:

- Smart Meters: These are digital meters - capable of two-way communications - with the ability to measure the incoming and outgoing flow of electricity from a specific location such as a customer's home or business. The two-way communication capability enables smart meters to provide usage data to both customers and BC Hydro – although in different formats. When paired with an in-home feedback method of the customer's choice, the smart meter can send timely consumption and price information directly to the customer. Smart meters will capture and store usage reads on an hourly basis and transmit these back to BC Hydro during short intervals at prescheduled times during the day.
- Metering Telecommunications: Consisting of two parts – the Field Area Network (localized to meters in the field) and the Wide Area Network connections

(enterprise wide focus) – this communications infrastructure provides the physical devices required to enable two-way transmission of data between smart meters and BC Hydro. There are several different ways this field-based communications infrastructure can be implemented, depending on the metering system selected.

- Automated Data Collection System (**ADCS**): This software application is designed to aggregate meter usage and event data from smart meters and manage the Field Area Network communications infrastructure. This software is provided by the Smart Metering System vendor.

1.3.2 Solution Integration

In addition to the overall Smart Metering System, the SMI Program includes requirements for the business environment that supports smart metering, including implementation of new business software applications, changes to existing information systems, enhanced data warehouse and analytics capabilities, and all the business transformation activities that will help BC Hydro to adapt to the new technologies and systems. Specific elements of scope include:

- Meter Data Management System: A software application that stores, validates, edits and analyses meter reading data prior to releasing it for integration into other BC Hydro operational systems such as customer billing, load forecasting, outage management, etc.
- Interfaces and Integration: This systems integration work involves modifying existing applications to handle the enhanced automated meter reading information, and building interfaces between new and existing enterprise applications to support BC Hydro's end-to-end business processes.
- Business Transformation: The major elements of business transformation work involves development of new and modified business processes, design of organizational and job changes, rollout of training and knowledge management programs, employee engagement to facilitate cultural change, and effective transition to business operations for ongoing work.

1.3.3 Advanced Theft Detection

Today, BC Hydro does not have the measurement devices and analytical tools to quickly and accurately identify where theft of electricity is occurring. A comprehensive theft detection solution, based on electricity balancing analysis, will be implemented as part of the SMI Program.

- Distribution System Meters: New meters (different from those to be installed at customer homes or businesses) will be installed at key points on BC Hydro's grid to measure electricity supplied to localized areas.
- Theft Analytics: A suite of software tools which support enhanced electricity network modeling methods, as well as the business rules required to analyze measurement data captured from new distribution system and smart meters.

1.3.4 Conservation Feedback Tools

Implementation of the Smart Metering System will enable BC Hydro to offer customers new methods of information access which work in conjunction with conservation programs designed to allow customers to save both electricity and money.

- **In-Home Display:** An attribute of the Smart Metering System is the Home Area Network – a communication channel directly from the smart meter into a customer's home or business. This channel enables customers to take advantage of a variety of display devices available in the market that can provide both real-time and accumulated energy consumption, represented in both cost and kilowatt-hours. Take-up of such in-home display devices will be by customer choice, with a variety of options expected to be available in the market. BC Hydro will provide financial incentives to enable customers to acquire a basic, market-available in-home display device.
- **Secure Web Site:** BC Hydro's existing web site will be expanded to include new interactive and informative applications – based on the hourly data captured from smart meters – designed to help customers better understand and model their energy usage.

- **Time-of-Use Rates:** A parallel but separate initiative to the SMI Program is the design and implementation of time-of-use rates to encourage customers, where possible, to shift their energy usage to off-peak periods. The new Smart Metering System (through its ability to capture hourly usage data) working in conjunction with the Meter Data Management System, helps enable the introduction of time-of-use rates. The actual design of time-of-use rates will involve consultation with customers and key stakeholders, and will be subject to review and approval by the British Columbia Utilities Commission (**BCUC**).

1.3.5 Grid Modernization Infrastructure Upgrades

This program scope element involves two key components, the specific requirements of which will depend on the metering technology selected:

- **Advanced Telecommunications Infrastructure:** The design and deployment of additional secure and reliable wide area telecommunications infrastructure to support advanced electricity grid functions and emerging customer applications like distributed generation.
- **Advanced Operational Support:** Implementation of a smart metering and network operations function to support real-time operations of the metering system. This support function will likely be implemented as an extension to BC Hydro's distribution operations centre, so that real-time system and telecommunications operations can be managed seamlessly and efficiently.

1.3.6 Program Delivery Activities

Included in the scope of the SMI Program are the overall program delivery activities and services which ensure all of the technical aspects of the SMI Program are successfully implemented, and accepted by BC Hydro's customers and stakeholders. These activities include:

- Project Management and Controls: Management and reporting on the delivery of all aspects of the SMI Program, including scope, schedule, budget, quality, issues resolution, environment management, and transition to operations.

- Security, Privacy and Safety: Governance and compliance for all the physical security, cyber security, data privacy, and employee, vendor and contractor safety aspects of the SMI Program.
- Finance & Regulatory: Financial oversight and regulatory support, including for BCUC proceedings.
- Public Relations, Stakeholder Engagement & Corporate Communications: Strategic communications, community engagement, customer communications, employee engagement, government relations, and media support.
- Contract Management: Management of the remaining procurement and tendering activities, as well as contractual commitments and any contract issues that may arise.

2 Procurement

In the fall of 2008, after a comprehensive formal procurement process, BC Hydro had short-listed to three Solution Integrators, who then submitted 'best and final offers' based on detailed requirements, designs, and discussions from joint solution design workshops held with all proponents. For each proponent, the total budget proposed was beyond an acceptable price point and BC Hydro was required to retain a substantial portion of cost, technology, or implementation risk. The level of retained risk was reviewed through an independent risk assessment completed by PricewaterhouseCoopers, LLP.

BC Hydro then engaged with peer utilities and closely monitored the evolving vendor marketplace. As metering vendors and technologies matured and stabilized, most large utilities were contracting directly with the key technology vendors where they would have more direct control. BC Hydro reconsidered its position and concluded that the original end-to-end approach was not in its best interests.

BC Hydro set aside the end-to-end approach and instead proceeded with a 'disaggregated' approach, undertaking separate and targeted procurement processes to select the core technology and services components critical to the SMI Program's immediate and long-term success.

Moving to a disaggregated procurement approach allows BC Hydro to exercise appropriate controls on the risk elements that will be retained by BC Hydro, primarily in the technology and deployment decisions, to ensure successful implementation of the SMI Project, at an acceptable cost.

The SMI Program's procurement process to date focuses on four major procurement streams, each critical to meeting the 2012 legislated date for meter installation.

- Solution Integrator - Project management and systems integration work. The Solution Integrator selected for BC Hydro's SMI Program is Capgemini. Capgemini has specialized technical expertise, having implemented smart metering projects for other utilities, including Hydro One in Ontario and San Diego Gas & Electric in California.

- Metering System - Smart meters, a field-based telecommunications system of collectors and relays, and a ADCS software application that manages the system communications network and meter data collection processes. The Metering System evaluation is currently short-listed to three proponents, with selection of the preferred proponent expected in January 2011.
- Meter Deployment Services - Meter installation and associated services such as supply chain management, work management integration, and deployment call centre services. The preferred proponent has been selected and contract negotiations are underway.
- MDMS - Software application to manage meter data, with installation and configuration services. The preferred proponent has been selected and contract negotiations are underway.

The scope of the SMI Program has not changed as a result of the modified procurement process.

3 Program Execution

3.1 Preliminary Activities

To prepare for delivery of the SMI Program, BC Hydro has been undertaking the following key activities:

- Developing a comprehensive set of requirements;
- Actively participating in technology and industry standards groups to ensure BC Hydro business needs are captured in industry standards;
- Monitoring the progress and results from utilities that were early implementers of smart metering projects and incorporating their lessons learned into BC Hydro's project planning; and
- Tracking the market evolution of metering technologies, software products, and in-home energy management offerings to ensure BC Hydro's solution choices are based on proven, long-term technologies.

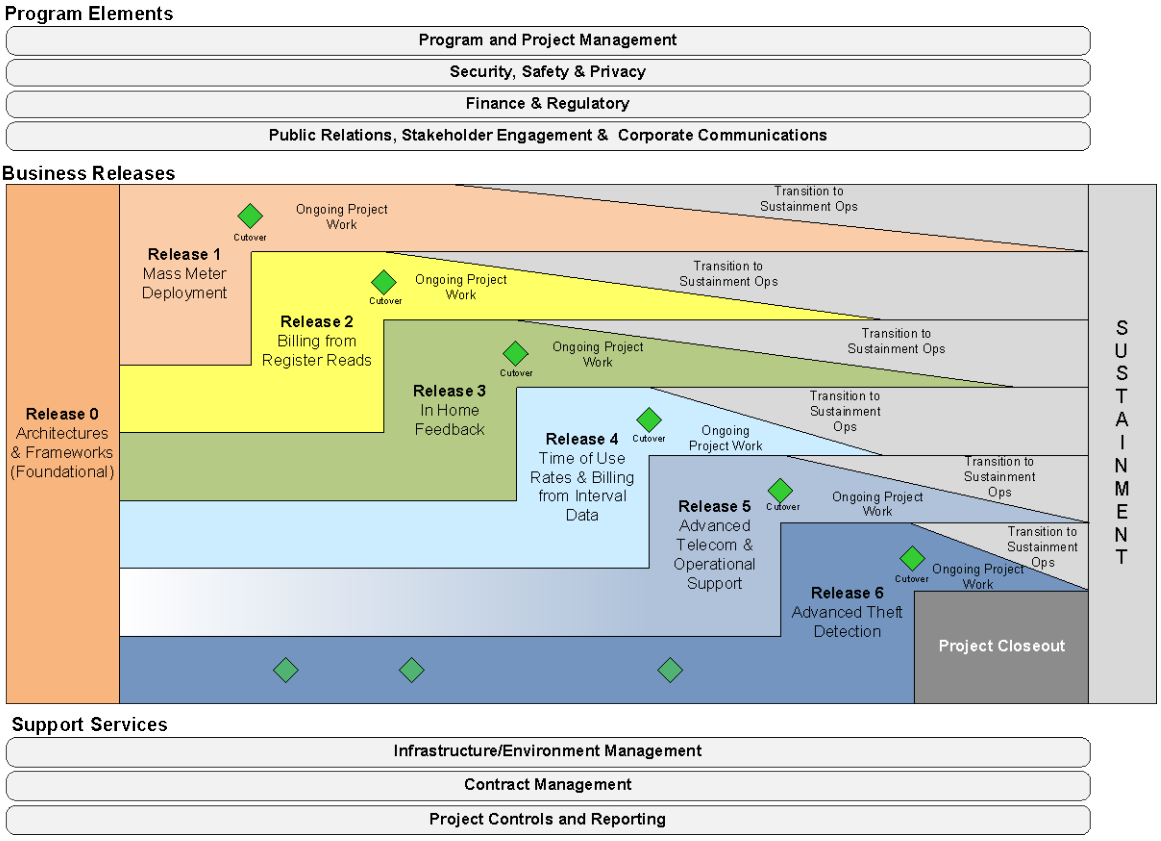
In collaboration with Capgemini operating under a Solution Integrator Interim Services Agreement in fall 2010, BC Hydro has been developing an approach for the SMI Program, supporting organizational structure, and strategies for solution integration and deployment.

3.2 Program Approach

The SMI Program is organized, managed, and executed through a structure based on releases – sets of defined functionality that will be delivered as a sub-project.

Figure 1 below provides the release view of the SMI Program. Supporting SMI Program elements are shown along the top and bottom of the diagram. Delivery of the SMI Program scope is shown in seven releases (releases Ø through 6).

Figure 1 SMI Program Framework



3.2.1 Program Elements & Support Services

Presented at the top of Figure 1 are a number of over-arching program elements which support aspects of the SMI Program as it is delivered:

- Program and Project Management: responsible for overall delivery of all aspects of the SMI Program, including scope, schedule, budget, quality, issues resolution, environment management, and transition to operations.
- Security, Safety, and Privacy: ensures appropriate governance and compliance for physical security, cyber security, data privacy, and employee, vendor, and contractor safety aspects of the SMI Program.
- Finance & Regulatory: provides financial oversight and regulatory support; and
- Public Relations, Stakeholder Engagement & Corporate Communications: supports the SMI Program with respect to strategic communications, community engagement,

customer communications, employee engagement, government relations, and media support.

At the bottom of Figure 1 are the support services for the SMI Program:

- Infrastructure/Environment Management: coordinates the implementation and maintenance of technology (hardware, software, and operating systems) to support the software development and testing.
- Contract Management: manages remaining procurement and tendering activities, as well as managing contractual commitments and any contract issues that may emerge.
- Project Controls and Reporting: provides a wide range of reporting to communicate status and progress during the SMI Program.

3.2.2 Releases

Each release shown in Figure 1 has one or more planned cutover dates (represented by a diamond) when business functionality is placed into service. After the cutover date, ongoing work is represented by the triangular tail that leads to a transition to sustainment operations.

More detail on the content of each release is provided in Table 1 below. For a high-level schedule with key milestones, please refer to Appendix A.

Table 1 Release Description

Release 0: Architectures and Execution Framework
▪ Foundational items are in place for the SMI Program including: – Solution Architecture – Information Management/Life Cycle Strategy – Security and Privacy Framework/Strategy – Test Strategy – Architecture Governance – Telecom Architecture

Release 1: Mass Meter Deployment

- Smart meters and supporting network infrastructure are deployed to BC Hydro's residential and commercial customers by December 2012
- BC Hydro is able to issue/close work orders for meter deployment with Meter Deployment vendor. Deployment process has been validated.
- BC Hydro is able to manage the lifecycle of smart meters and collectors.
- Smart Metering and Network Operations (**SMNO**) is able to communicate with, support, maintain, and troubleshoot meters, collectors and associate network, including the ability to ping the meter to support on-demand reads or status checks.
- Customer service representatives have visibility to determine whether customer has a smart meter or traditional meter.
- BC Hydro is ready to respond to calls from customer regarding meter deployment, with routing to Meter Deployment Vendor call centre if applicable.
- Initial system security and privacy framework has been designed, developed, implemented and is operational.

Release 2: Billing from Register Reads

- Customers with smart meters are able to be billed from scheduled register reads, which is calculated using the current rate structures.
- Manual meter reading routes can start to be decommissioned.
- BC Hydro is able to register Distribution System Meters with the ADCS.

Release 3: In-Home Feedback, both In-Home Displays and Secure Web Site

- Customers with smart meters are able to access a web portal that displays daily consumption data from register reads (at least one day lag).
- Customers with smart meters are able to pair one Power Smart certified IHF device to a smart meter with help of customer service representatives or through a retailer.
- Customer service representatives will be able to determine what IHF devices are paired with meter.
- Customer service representatives are able to un-pair IHF devices at customer's request or at move-out.
- Customer service representatives are able to re-pair an IHD device to a meter in the event of a meter swap.
- IHF can display basic rate information.
- Release 3 provides the functionality to support IHF devices.

Release 4: Time-of-Use Rates and Billing from Interval Data

- The billing system is capable of supporting time-of-use rates using interval data supplied by the MDMS.
- Billing exceptions team are able to access interval data to address bill complaints.
- Customers are able to access a web portal that displays interval data and other tools to help manage their energy use.
- Release 4 provides the functionality to support time-of-use rates; however, the actual implementation of those rates may come later than Release 4 subject to approval of rates by the BCUC.

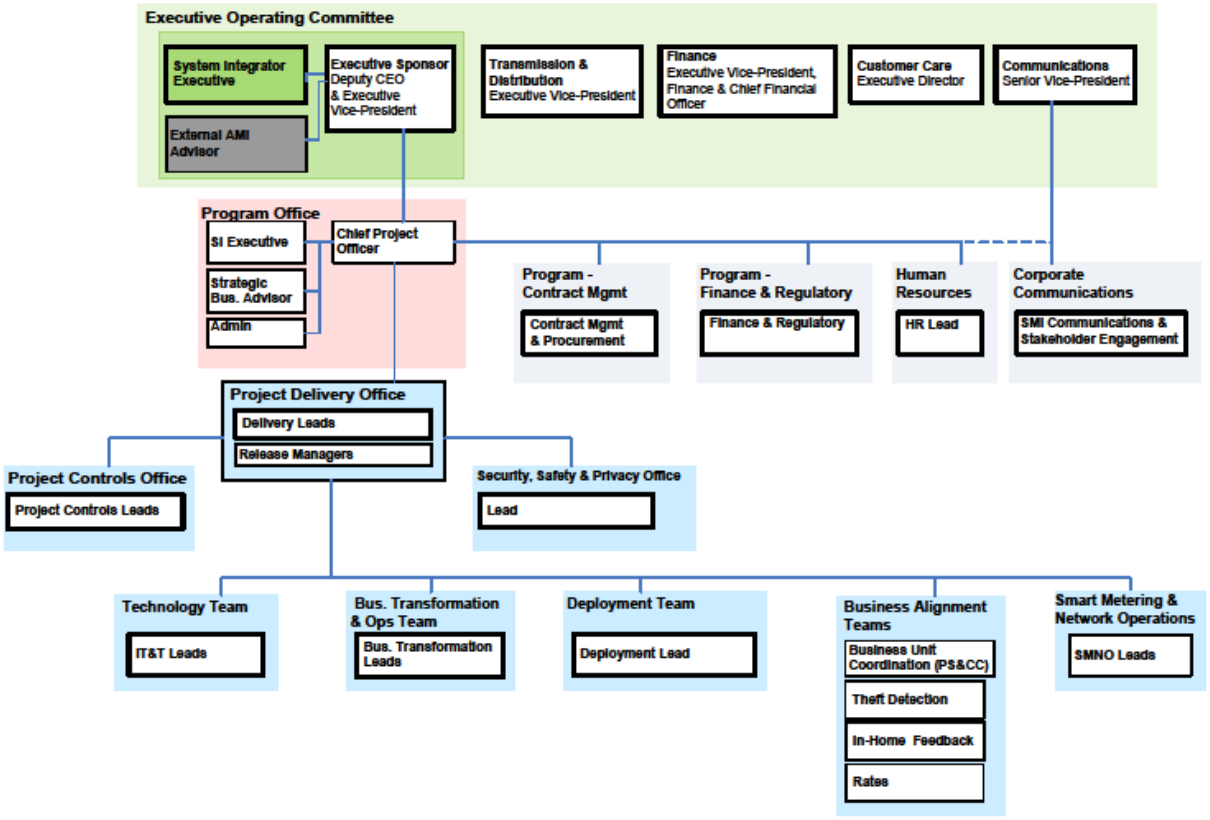
Release 5: Advanced Telecom and Operational Support
▪ Other authorized business groups can perform on-demand meter reads or status checks. ▪ Additional data from meters is published to the Enterprise Service Bus for use by and in support of such areas as Load Research, Outage Management, Distribution Management System and Volt VAR Optimization. ▪ Advanced telecommunication devices and infrastructure to support advanced smart grid and customer applications.
Release 6: Advanced Theft Detection
▪ Tamper flag notification is in place, with a basic process to handle tamper flags. (Note: this functionality will be delivered very early in the SMI Program.) ▪ The full theft detection solution involving production scale deployment of equipment (transformer/distribution system meters), advance analytical software, topology models and people is ready for implementation. ▪ BC Hydro able to identify potential theft through advanced analytics. ▪ BC Hydro able to confirm and quantify theft using advanced tools.

3.2.3 Organizational Structure

The SMI Program is being delivered using resources from Capgemini, BC Hydro, Accenture Business Services for Utilities (**ABSU**), and other vendors such as those providing deployment services, metering systems, and meter data management systems.

A high-level organization chart for the SMI Program is provided in Figure 2.

Figure 2 SMI Program Organization Chart



Sections 3.2.3.1 through 3.2.3.10 describe the Project Delivery Office and the delivery areas beneath it. A detailed diagram of the Project Delivery Office structure is provided as Appendix B.

3.2.3.1 Project Delivery Office

The Project Delivery Office takes an integrated management team approach to delivering the SMI Program. Co-led by a BC Hydro Project Delivery Lead and a Capgemini Project Delivery Lead, this team is responsible for delivering the SMI Program on schedule and within budget.

3.2.3.2 Project Delivery Leads

The Project Delivery Leads are responsible for developing and executing the processes and procedures for the implementation and ongoing monitoring of the SMI Program. Specific activities of the integrated Project Delivery team include management of the following:

- Change orders to contracts;
- Risks and issues;
- Resourcing;
- Issues within or across work streams or across vendors;
- Tradeoffs among scope/schedule/budget; and
- Timing of release cutovers.

3.2.3.3 Release Managers

The Project Delivery Office includes a number of Release Managers who are responsible for the overall delivery of one or more of the releases outlined above. The responsibilities of the Release Manager are as follows:

- Develop and manage release level objectives, risk management plan, and integrated breakdown of tasks.
- Manage end to end application scoping, planning, development, testing and implementation for both business and technology aspects of the release.

- Ensure a proper transition of the release into a stabilized operational environment, including any prescribed warranty period.

3.2.3.4 Project Controls

The Project Controls Office reports directly to the Delivery Leads in the Project Delivery Office. Project Controls provides the following:

- Operational Delivery Support: Project Controls establishes and manages the tools, processes and resources to ensure that information required to manage the SMI Program is being captured and addressed within the delivery groups.
- Tactical Planning: Project Controls supports team members in applying the controls framework effectively and efficiently.

3.2.3.5 Security, Privacy and Safety Office

This work stream defines and implements the security, privacy and safety policies for the SMI Program and overall solution. This includes:

- Safety by Design: Workplace assessment, corporate safety committee, incident management.
- Information protection: Data and device security, document classification.
- Physical protection: Access to SMI Program space, incident reporting, suspicious incident reporting, asset protection.
- Privacy: Assessment, privacy training, data privacy, information storage.
- Emergency Planning & Fire Safety: Incident response, emergency callout process, fire plans, emergency training, first aid.
- Security, Privacy & Safety Training: Including all major topic areas, ongoing communication and awareness campaigns through the life of the SMI Program.

Additional security, privacy and safety issues are expected to arise through the life of the SMI Program. Procedures for handling and escalating issues will be developed and integrated with BC Hydro's incident management systems, investigation, security command

centre interfaces and incident resolution or management to ensure alignment with security, privacy and safety policies, procedures and issues management.

3.2.3.6 Technology

Technology is co-led by BC Hydro and Capgemini. Within the Technology area are teams for solution architecture, information technology (**IT**) delivery, telecommunications design, metering, and testing. IT delivery consists of delivery of application systems integration services, including new systems, corporate system changes, and system interfaces.

3.2.3.7 Business Transformation and Operations

The Business Transformation and Operations team's focus is on the design, development and implementation of modified and new business processes, organization structures, job roles, policies and standards to help the organization effectively adapt to the new technologies and systems being introduced by the program.

The major components of work are:

- Business Transformation Design: People/organizational changes, processes, and training/knowledge management; and
- Operational Implementation, including transition to business operations.

3.2.3.8 Deployment

The Deployment work stream is led by BC Hydro and is responsible for the deployment of meters and telecommunications infrastructure. The Meter Deployment Vendor team will report through the BC Hydro Field Deployment Lead on a day-to-day basis, as will the Metering System vendor team.

3.2.3.9 Smart Metering & Network Operations

The Smart Metering & Network Operations work stream collaborates with other BC Hydro operating centres. Resources are being provided by BC Hydro, Capgemini and the Metering System vendor. This work stream provides meter communications network operations, network polling, setup, execution and maintenance during delivery and will transition to the responsible BC Hydro operating group as part of deployment completion. This work stream

also provides operational support to the Meter Data Management System and the Home Area Network.

3.2.3.10 Business Alignment

BC Hydro has a number of business leads (Theft Detection; In-Home Feedback; and Rates) that are responsible for delivering specific work streams through engagement of operating groups in other BC Hydro business units. These leads will have BC Hydro resources reporting to them for the duration of the SMI Program and will work closely with the appropriate release managers and work stream leads to deliver functionality.

3.3 Solution Integration

3.3.1 Systems Integration

Systems Integration Services implement the systems required to support the architecture and requirements for the SMI Program. This includes activities to modify corporate systems, implement new systems and develop new interfaces to support the SMI Program. This also includes the testing activities to confirm whether implemented software is meeting documented requirements, and upon test completion and business readiness, cutover to production.

There are multiple work streams responsible for delivering software engineering components that are required to achieve business objectives for the SMI Program. Though the exact delivery methods and deliverables will vary by team, the overall process of building software is similar.

This work includes:

- Requirements – define the business, functional, and non-functional needs. This also includes requirements for configuration, data conversion, integration, performance, and user interface.
- Design – transform the requirements and business processes into technical specifications. The objectives of the design phase are to create the design and development models that will ultimately be implemented (coded/configured). Designs

to meet specifications defined during the requirements phase while following architecture guidelines and approved design standards, as appropriate.

- Delivery – develop the functionality specified, which includes:
  - Corporate System modifications – modifications of existing BC Hydro corporate systems required to deliver SMI System functionality.
  - New Systems – design and development and/or configuration of new systems to deliver SMI System functionality.
  - Systems Integration – integration between various applications that make up the SMI System.
- Integrated Testing – testing of all new systems, corporate system modifications, system integration, security and privacy, and other tests that may be identified.
- Environment Management – management of the infrastructure to support the various environments (e.g., development, test) required to run the SMI Program.

3.3.2 Business Transformation and Operations

Business Transformation and Operations involves understanding and identifying the impact of SMI Program-related changes with respect to roles (new and existing) and organizational design. Impacts can be broadly categorized as changes in processes, skills, policies, and/or volumes. Once impacts are understood, strategies and plans are put in place to ensure the organization is ready to incorporate SMI Program-related processes, technologies and systems into their day-to-day operations.

Process design is done through collaborative meetings and facilitated workshops with BC Hydro impacted groups, relevant SMI Program work streams and the vendor community. Those impacted groups who are responsible for operationalizing the new processes will be heavily involved in developing the future state, and will be responsible for the final sign-off before go-live.

Changes in business processes require that affected employees are trained and/or made aware of the changes. The training strategy and approach is highly dependent on the nature of the change and the employee groups that are impacted.

Where applicable, this work stream will look at the best sustainment approach. Transition to sustainment will include working with impacted business groups and relevant work streams to identify and implement any necessary changes to improve the operations and to ensure ongoing operational success and benefits realization.

3.4 Deployment

The Deployment work stream coordinates and executes the activities necessary for design, field installation and logistics required to complete the deployment of the SMI Program, including managing the deployment of the following:

- Smart meters for eligible customers.
- Data aggregation devices and other relay devices, which are used to start consolidating meter reading data in the field (dependent on technology solution selection).
- Customer experience and communications regarding deployment.

Contract negotiations with a preferred Meter Deployment Services vendor are currently underway. A detailed deployment plan is being finalized as part of the contract.

3.4.1 Scope of Deployment

Once the Metering System vendor and Meter Deployment vendor selection and contractual process are completed, the Deployment team will work closely with vendor representatives to deploy smart meters.

The meter deployment scope includes:

- Installing meters.
- Managing hardware inventory to implement deployment activities and transition BC Hydro stores stock to smart meters.
- Planning, scheduling and completion of complex meter installs and ‘unable to complete’ meter installs.
- Planning, design and procurement of the wide area network (**WAN**) solution to support the communications infrastructure.

- Planning, scheduling and installation of network hardware infrastructure according to network design requirements.
- Field maintenance and tuning of the communication network infrastructure required to optimize the network performance to meet an agreed upon criteria enabling transition of network operations to sustainment.

3.4.2 Deployment Approach

Smart meter deployment is being implemented using a combined field force of BC Hydro staff, contracted staff, and a Meter Deployment services installation vendor strategically deployed throughout BC Hydro's service territory. The smart meter and network solution is being deployed across the province in geographic regions.

The planned timeline of the deployment schedule, which spans July 2011 through December 2012, requires a strategy that logically divides the deployment territory into a number of operational areas, where deployment crews and meter inventory will be regionalized to expedite and maximize installation throughput and introduce efficiencies to control travel time and costs.

Regional inventory and materials management will be co-located within operation centres where deployment crews will be based during deployment in a specific area. These facilities that receive, issue**,** and manage inventory – referred to as cross docks – will provide secure control, management and storage of SMI Program inventory as well as the recovery and management of the old replaced meters. Old meters will be processed for environmentally responsible recycling consistent with corporate policy.

3.4.3 Deployment Controls Centre

In order to provide centralized support and effectively manage its many activities, the Deployment team is setting up and operating a Deployment Controls Centre. The Centre provides end-to-end project management for all operational aspects of deployment, including:

- Execution of the deployment plans and schedules;

- Definition, design, maintenance and implementation of deployment processes, tools and training materials;
- Operation, maintenance and modifications to the Work Management Information System and operation of the vendor Deployment Field Tool application;
- Scheduling, tracking and management of network field design and hardware deployment activities;
- Tracking of customer deployment activities; and
- Deployment exceptions management including installation and work order exceptions management.

3.4.4 Communications

Communications, to both employees and BC Hydro customers, is critical to facilitating the meter installations. A comprehensive internal and customer deployment communications strategy, tactics and execution process are being developed. The intent is to enable customer satisfaction and minimize customer impacts as well as provide timely status and information on the deployment initiative to internal BC Hydro resources as well as the SMI Program team members.

3.4.5 Safety

Safety has been considered a key priority throughout the development of the SMI Program. The SMI Program redefines many of the existing business processes – and introduces new ones - requiring that safety is embedded in each and every aspect.

Within procurement, vendors need to ensure that they are prepared to abide by all BC Hydro safety standards, and are asked to describe their safety programs and how they propose to adhere to BC Hydro safety principles. As well, BC Hydro's Safety By Design practice is referenced as a specification.

Operation of equipment includes safety considerations such as placement of equipment, operation of equipment, and designing new components. In order to minimize safety risk to BC Hydro employees, consumers and the public, the Safety by Design requirements are the basis for all designs.

Internal procedures include a Safety By Design Project Hazard matrix for proposed technologies and their placement, preliminary standards work for telecom components and their mounting, meter installer training program review by BC Hydro Work Methods department, and mandatory safety requirements and qualifications for meter deployment proponents, including compliance with WorkSafe BC and the Safety Standards Act, with a specific focus on vehicle safety, and provision for safety audits of the deployment work.

3.5 Project Schedule

The SMI Program schedule is provided in Appendix A. Recent activities and milestones are described below.

Overall

- On June 3, 2010, the CEA received Royal Assent, legislating BC Hydro to proceed with the SMI Program.
- On September 16, 2010, the BC Hydro Board of Directors approved for implementation an Expected Amount of $840 million for the SMI Program, with an Authorized Amount of $930 million.
- On December 15, 2010, the *Smart Meters and Smart Grid Regulation* was enacted.

Procurement

- In 2010, BC Hydro's activities with respect to the SMI Program have been focused on the design, issue and completion of procurement processes for four primary work packages and the award of major contracts that are on the critical path for the initial mass deployment of metering infrastructure for the SMI Program.
- The SMI Program's Executive Project Board approved a 'disaggregated' procurement strategy in March 2010, whereby BC Hydro would procure the key elements separately rather than through a single end-to-end turnkey system. The key elements that would be the major Request for Proposals (**RFPs**) were identified as System Integrator, Metering System, Meter Deployment Services, and MDMS.
- A Fairness Advisor was engaged to provide advice with respect to the SMI Program procurement processes.

System Integrator

- Following the approval of a "disaggregated" procurement strategy, an amended RFP package was created and issued to three vendors in June with final responses received in July 2010.
- Interactive workshop sessions were held in June to provide clarity on technical aspects and contract terms.
- Evaluation of vendor submissions was done in July, arriving at a recommended proponent, Capgemini.
- BC Hydro entered into a 90-day "Early Works – Interim Service Agreement" with Capgemini to enable work to begin immediately on the execution plan and baseline plan development.
- The BC Hydro Board of Directors approved execution of the Master Service Agreement with Capgemini in December 2010.

Metering System

- The Metering System RFP was issued in July 2010.
- Twenty responses were received in September, and a short-list of three proponents was established in October. Revised proposals were received in November. Final evaluation and selection of a recommended vendor will be concluded in December 2010.
- The recommendation of a preferred proponent will be brought forward to the BC Hydro Board of Directors in January 2011.

Meter Deployment Services

- The Meter Deployment Services RFP was issued in July 2010.
- Interactive workshops were held and seven proposals were received in September, with evaluation of the proposals conducted in October.
- In November 2010, the BC Hydro Board of Directors approved proceeding to final negotiations with the recommended vendor.
- The contract is expected to be executed in January 2011.

Meter Data Management System

- The Request for Qualifications document for the MDMS was issued to the market in May 2010, and seven responses were received and evaluated in June.
- The RFP was issued to four pre-qualified proponents in September. Interactive workshops were held in October, proposals received in November, and evaluation concluded in December.
- The recommendation of a preferred proponent was brought forward to the SMI Program's Executive Operating Committee on December 15, 2010.

Project Execution

- A first draft of the comprehensive Project Execution Plan was developed that describes the detailed scope of SMI Program components, approach, integrated work plan, resourcing plan, timeline, risk and issue management, budget management, governance, reporting, and change management controls. The Project Execution Plan is expected to be finalized in spring 2011.

Communications

- A comprehensive SMI Communications and Engagement Strategy was developed and presented to the Executive Project Board and BC Hydro executives in July 2010.
- Baseline research to assess awareness and understanding of smart metering among non-English speaking customers was conducted from July to September 2010.
- Community and stakeholder engagement activities commenced in November 2010 and will continue throughout the SMI Program.

4 Program Expenditures

As approved by the BC Hydro Board of Directors, the Authorized Amount for the SMI Program expenditures is $930 million (nominal), with $840 million as the Expected Amount and an additional $90 million in reserve to be controlled by the Board of Directors.

The SMI Program costs are spread over four major phases:

- Initiation Phase – Completed in F2007.

- Identification Phase – Completed in F2008.
- Definition Phase – Completed in F2011.
- Implementation Phase – Scheduled to be fully completed in F2014, with the deployment of customer meters completed by December 2012.

Table 2 below shows SMI Program expenditures for each phase. For the Implementation Phase, the budgeted expenditures are further allocated to the key scope elements included in the SMI Program, specifically:

- Smart Metering System;
- Solution Integration;
- Advanced Theft Detection;
- Conservation Feedback Tools;
- Grid Modernization Infrastructure Upgrades; and
- Program Delivery Activities.

Table 2 Expenditures

		$ millions
Initiation Phase (Completed F2007)		***1.4***
Identification Phase (Completed F2008)		***8.9***
Definition Phase (Completed F2011) [1]		***38.8***
Implementation Phase (F2011 to F2014)		
Smart Metering System:		
Architecture & Design	8.6	
Assets: Smart Meters, Telecommunications, ADCS Software	256.0	
Deployment Activities	126.5	
Total		391.1
Solution Integration (Information Technology:)		
Architecture & Design	3.2	
Assets: MDMS and Other Applications	7.9	
Implementation Activities	49.8	
Total		60.9
Theft Detection		
Architecture & Design	2.6	
Assets: Distribution System Meters, Application Software	62.7	
Deployment Activities	45.2	
Total		110.5
Conservation Feedback Tools		
Architecture & Design	2.4	
Assets: IHD's, Web Site, Software Supporting TOU Rates	18.4	
Rebate Program Rollout	42.0	
Total		62.8
Grid Modernization Infrstructure Upgrades		
Architecture & Design	1.9	
Assets: AdvancedTelecom Devices & Applications	33.0	
Deployment Activities	19.3	
Total		54.2
Program Delivery Activities		
Project Management & Controls	22.2	
Safety, Security, Privacy Governance	1.1	
Finance & Regulatory	2.4	
Communications	8.6	
Contract Management	2.7	
Total		37.0
Total		***716.5***
Interest During Construction		***14.4***
Contingency		***60.0***
Sub-Total: Program Expected Amount		**840.0**
Reserve Subject to Board Control		***90.0***
Total: Program Authorized Amount		***930.0***

[1] Includes Preliminary Engineering & Design, Procurement Processes, and Program Management

5 Executive Level Governance

The SMI Program is governed by the BC Hydro Board of Directors, the Executive Project Board, and an Executive Operating Committee.

The BC Hydro Board of Directors provides the core governance function for the SMI Program, including approval of the SMI Program budget, scope, and schedule, as well as significant changes to scope and schedule. The SMI Program also has a standing agenda item for all regular Board of Director meetings through the duration of the SMI Program, so that the Board of Directors can receive periodic briefings on the status and progress.

The SMI Program's Executive Project Board authorizes decisions to be brought forward to the Board. It also provides decision-making and/or direction to support the SMI Program's ability to deliver.

The SMI Program's Executive Operating Committee provides executive oversight to the functioning of the SMI Program and resolves issues that are beyond the team's authority or current ability to resolve. Its members, who are executives from across BC Hydro, resolve specific policy, operational, resource, funding and other issues that fall within their respective organization unit mandates.

Smart Metering & Infrastructure Program

BC hydro

Appendix

A

SMI Program Schedule

BC hydro

RELEASE 0 - FOUNDATIONAL
- Confirm Solution Architectures, Frameworks and Testing Strategy

RELEASE 1 - READY FOR METER DEPLOYMENT
- Automated Data Collection System (ADCS) Implementation
- Meter Deployment Support System (Field Tool) Implementation
- Work Management Interface System (WMIS) Implementation
- Corporate System Changes and System Integration
- Integrated Testing
- Business Transformation - Process Design
- Smart Metering & Network Operations (SM&NO)

RELEASE 1 - DEPLOYMENT
- Conduct Deployment Planning and Readiness
- Manage Deployment
- Business Transformation - Training
- Transition Deployment Regions to Operations

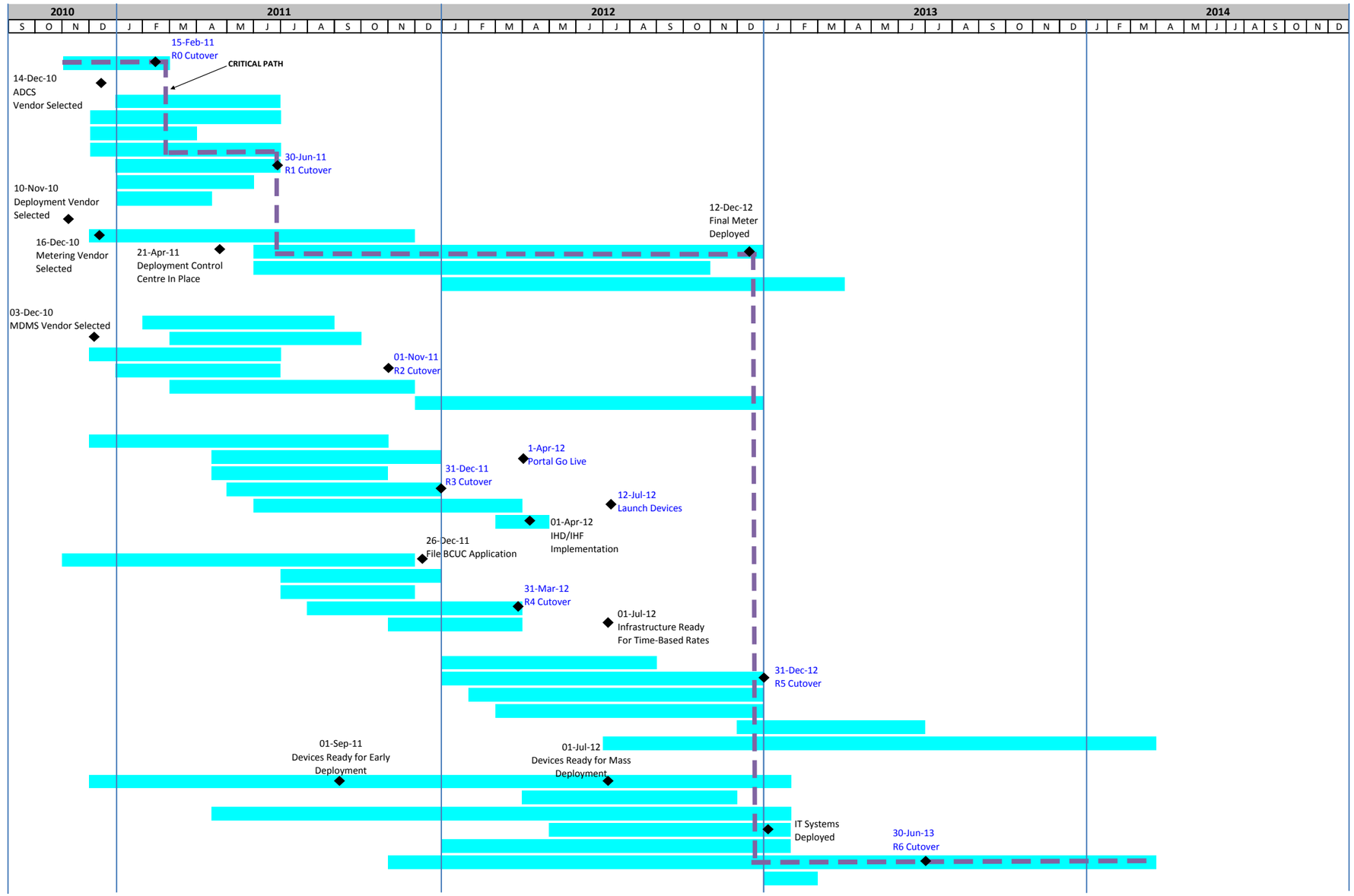
RELEASE 2 - BILLING FROM REGISTER READS
- Comparison Process Implementation
- Meter Data Management System (MDMS) Implementation
- Corporate System Changes and System Integration
- Integrated Testing
- Business Transformation - Process Design & Training
- Business Transformation - Decommission/Optimize Meter Routes

RELEASE 3 - IN HOME FEEDBACK
- In Home Devices (IHD) and In Home Feedback (IHF) Procurement
- ADCS Portal Implementation
- Corporate System Changes and System Integration
- Integrated Testing
- Business Transformation - Process Design & Training
- Business Transformation - Transition to Operations

RELEASE 4 - TIME-OF-USE RATES & BILLING FROM INTERVAL DATA
- Dynamic Rate Design
- ADCS Portal Expansion & DRMS Implementation
- Corporate System Changes and System Integration
- Integrated Testing
- Business Transformation - Process Support

RELEASE 5 - ADVANCED TELECOM & OPERATIONAL SUPPORT
- On Demand From Portal Implementation
- Corporate System Changes and System Integration
- Integrated Testing
- Business Transformation - Process Design & Training
- Business Transformation - Implement Remote Connect / Disconnect
- Advanced Telecom Design & Implementation

RELEASE 6 - ADVANCED THEFT DETECTION
- Equipment Acquisition and Field Trials
- Advanced Theft Analytics System Implementation
- Corporate System Changes and System Integration
- Integrated Testing
- Business Transformation - Process Design & Training
- Equipment Deployment
- Business Transformation - Implement Advanced Theft Detection Solution



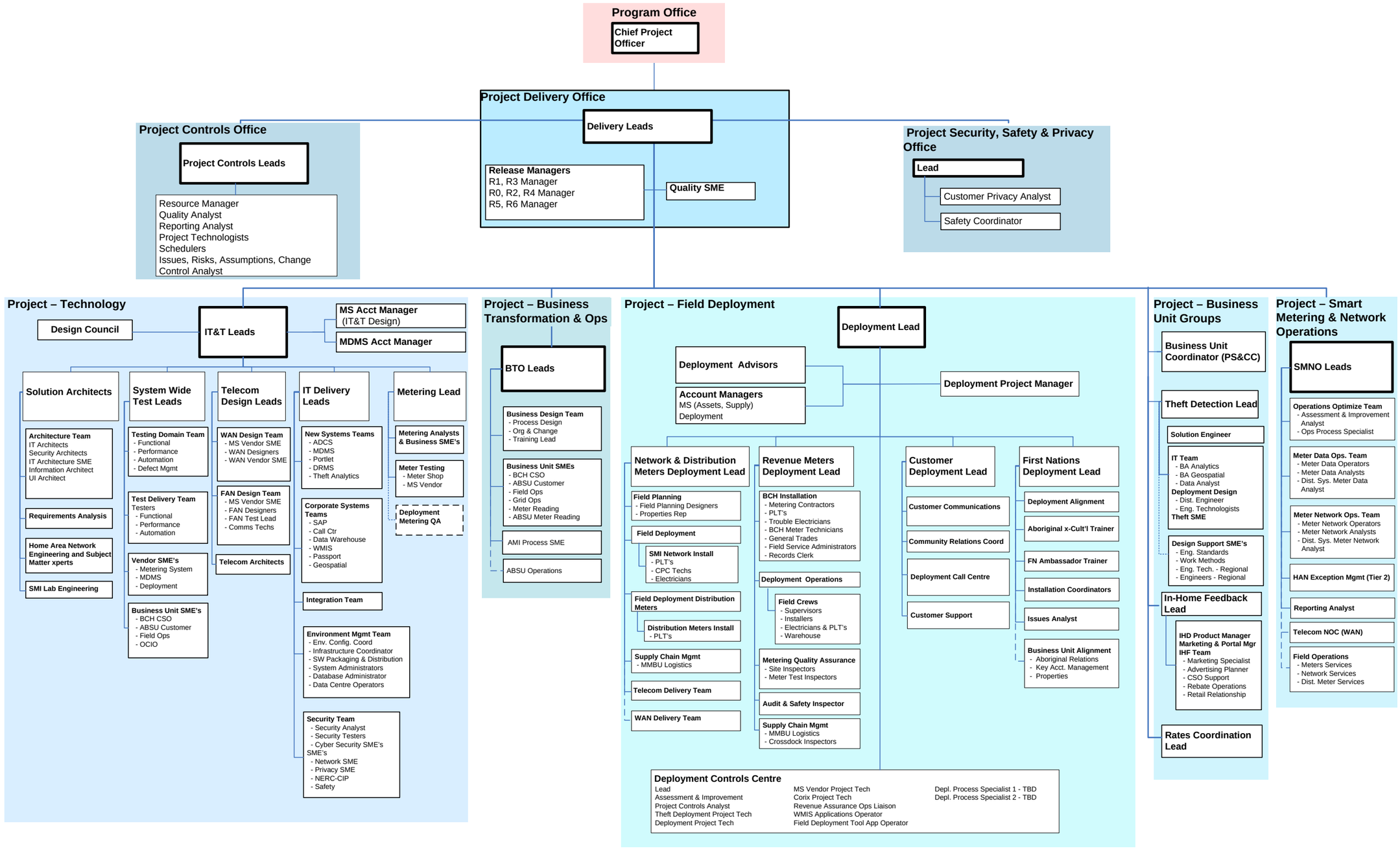
Smart Metering & Infrastructure Program

BC hydro

Appendix

B

Project Delivery Organizational Chart


Program Office
Chief Project Officer
Project Delivery Office
Delivery Leads
Release Managers
R1, R3 Manager
R0, R2, R4 Manager
R5, R6 Manager
Quality SME
Project Controls Office
Project Controls Leads
Resource Manager
Quality Analyst
Reporting Analyst
Project Technologists
Schedulers
Issues, Risks, Assumptions, Change Control Analyst
Project Security, Safety & Privacy Office
Lead
Customer Privacy Analyst
Safety Coordinator
Project – Technology
Design Council
IT&T Leads
MS Acct Manager (IT&T Design)
MDMS Acct Manager
Solution Architects
Architecture Team
IT Architects
Security Architects
IT Architecture SME
Information Architect
UI Architect
Requirements Analysis
Home Area Network Engineering and Subject Matter xperts
SMI Lab Engineering
System Wide Test Leads
Testing Domain Team
- Functional
- Performance
- Automation
- Defect Mgmt
Test Delivery Team
Testers
- Functional
- Performance
- Automation
Vendor SME's
- Metering System
- MDMS
- Deployment
Business Unit SME's
- BCH CSO
- ABSU Customer
- Field Ops
- OCIO
Telecom Design Leads
WAN Design Team
- MS Vendor SME
- WAN Designers
- WAN Vendor SME
FAN Design Team
- MS Vendor SME
- FAN Designers
- FAN Test Lead
- Comms Techs
Telecom Architects
IT Delivery Leads
New Systems Teams
- ADCS
- MDMS
- Portlet
- DRMS
- Theft Analytics
Corporate Systems Teams
- SAP
- Call Ctr
- Data Warehouse
- WMIS
- Passport
- Geospatial
Integration Team
Environment Mgmt Team
- Env. Config. Coord
- Infrastructure Coordinator
- SW Packaging & Distribution
- System Administrators
- Database Administrator
- Data Centre Operators
Security Team
- Security Analyst
- Security Testers
- Cyber Security SME's
SME's
- Network SME
- Privacy SME
- NERC-CIP
- Safety
Metering Lead
Metering Analysts & Business SME's
Meter Testing
- Meter Shop
- MS Vendor
Deployment Metering QA
Project – Business Transformation & Ops
BTO Leads
Business Design Team
- Process Design
- Org & Change
- Training Lead
Business Unit SMEs
- BCH CSO
- ABSU Customer
- Field Ops
- Grid Ops
- Meter Reading
- ABSU Meter Reading
AMI Process SME
ABSU Operations
Project – Field Deployment
Deployment Lead
Deployment Advisors
Account Managers
MS (Assets, Supply)
Deployment
Deployment Project Manager
Network & Distribution Meters Deployment Lead
Field Planning
- Field Planning Designers
- Properties Rep
Field Deployment
SMI Network Install
- PLT's
- CPC Techs
- Electricians
Field Deployment Distribution Meters
Distribution Meters Install
- PLT's
Supply Chain Mgmt
- MMBU Logistics
Telecom Delivery Team
WAN Delivery Team
Revenue Meters Deployment Lead
BCH Installation
- Metering Contractors
- PLT's
- Trouble Electricians
- BCH Meter Technicians
- General Trades
- Field Service Administrators
- Records Clerk
Deployment Operations
Field Crews
- Supervisors
- Installers
- Electricians & PLT's
- Warehouse
Metering Quality Assurance
- Site Inspectors
- Meter Test Inspectors
Audit & Safety Inspector
Supply Chain Mgmt
- MMBU Logistics
- Crossdock Inspectors
Customer Deployment Lead
Customer Communications
Community Relations Coord
Deployment Call Centre
Customer Support
First Nations Deployment Lead
Deployment Alignment
Aboriginal x-Cult'l Trainer
FN Ambassador Trainer
Installation Coordinators
Issues Analyst
Business Unit Alignment
- Aboriginal Relations
- Key Acct. Management
- Properties
Deployment Controls Centre
Lead
Assessment & Improvement
Project Controls Analyst
Theft Deployment Project Tech
Deployment Project Tech
MS Vendor Project Tech
Corix Project Tech
Revenue Assurance Ops Liaison
WMIS Applications Operator
Field Deployment Tool App Operator
Depl. Process Specialist 1 - TBD
Depl. Process Specialist 2 - TBD
Project – Business Unit Groups
Business Unit Coordinator (PS&CC)
Theft Detection Lead
Solution Engineer
IT Team
- BA Analytics
- BA Geospatial
- Data Analyst
Deployment Design
- Dist. Engineer
- Eng. Technologists
Theft SME
Design Support SME's
- Eng. Standards
- Work Methods
- Eng. Tech. - Regional
- Engineers - Regional
In-Home Feedback Lead
IHD Product Manager
Marketing & Portal Mgr
IHF Team
- Marketing Specialist
- Advertising Planner
- CSO Support
- Rebate Operations
- Retail Relationship
Rates Coordination Lead
Project – Smart Metering & Network Operations
SMNO Leads
Operations Optimize Team
- Assessment & Improvement Analyst
- Ops Process Specialist
Meter Data Ops. Team
- Meter Data Operators
- Meter Data Analysts
- Dist. Sys. Meter Data Analyst
Meter Network Ops. Team
- Meter Network Operators
- Meter Network Analysts
- Dist. Sys. Meter Network Analyst
HAN Exception Mgmt (Tier 2)
Reporting Analyst
Telecom NOC (WAN)
Field Operations
- Meters Services
- Network Services
- Dist. Meter Services

Smart Metering & Infrastructure Program

BC hydro

Appendix

C

Glossary

BC hydro

Glossary

A

Architecture	The structures of a solution which comprise software, firmware and/or hardware components, the properties of those components and the relationships/interactions between them.
Authorized Amount	Requested funding for a project inclusive of all contingencies and based on a fixed scope and in-service date. The Authorized Amount is the equal to the Expected Amount plus Reserve.
ADCS	Automated Data Collection System The system that manages the SMI system communications network and meter data collection processes.

B

BCUC	British Columbia Utilities Commission An independent regulatory agency of the B.C. government operating under and administering the Utilities Commission Act. Its responsibility is the regulation of the energy utilities under its jurisdiction.
Business Transformation	Activities associated with the business aspect of change to support the business in a new operating model, including process design and alignment as well as impact assessments.

C

Collector	A device that serves as a local collection point for smart metering information, then passes it back to the utility.

D

Distributed Generation	Allows customers to generate power on a smaller-scale in order to provide an alternative to or an enhancement of the traditional electrical power system. It can take the form of solar panels, wind power, biomass, etc.
Distribution Management System	A set of software applications that are designed to provide more automated and integrated management of the electric distribution system.
Distribution System Meter	A meter placed on a piece of the distribution system part of the power grid. Transformers and feeders are examples of distribution equipment that could have a meter.

E

Energy	Electric Energy is measured and expressed in kilowatt hours.
ESB	Enterprise Service Bus A common integration architecture for business software applications and applicable smart metering applications
Expected Amount	The estimated project cost including contingencies and appropriate loadings, but not including any Project Reserve.

F

FAN	Field Area Network The hardware components, software and communications devices used to transmit and receive data signals between residential and other applicable meters and devices on one end and the WAN and applicable upstream meters and devices at the other end.

G

GIS	Geographic Information System An electronic mapping system for analyzing, capturing, storing and manipulating geographical information relative to established positions on the Earths' surface, for which geographic data is typically represented in layers comprised of one or more features (such as roads, BC Hydro assets, etc).

H

HAN — Home Area Network

A network exclusive to an individual customer, made up of a gateway and data transmission mechanism that provides meter data, meter events, and other related notifications to the customer's in-home display device, remote communication devices, and a web portal.

I

In-Home Display — A standalone device that communicates with a smart meter to show how much energy is being used at that time, and at what cost.

In-Home Feedback — Different ways through which customers can receive feedback about the electricity they are consuming, and the cost of that electricity, in their home, business or other location. In-home feedback can include in-home display and/or a secure web page, home energy management systems, and so on in order to provide information about energy consumption.

Integration — The process by which smaller applications and/or pieces of software are brought together to form a larger software application as well as the development process that enables data from one device to software application to be read or manipulated by another.

Interval Read — A measure of the energy consumption for a given period of time e.g. 7 kWh for 12noon-1pm yesterday. See also Register Read

M

MDMS — Meter Data Management System

The software applications and infrastructure required to support the integration of data from the smart metering system into other BC Hydro systems. The data is made available to the utility for a variety of business functions such as billing, energy diversion detection and outage tracking.

Meter Event — A change in the state of the meter or notification of a threshold or alarm set point being exceeded.

R

Rate	BC Hydro's rate schedules found in the Electric Tariff and approved by the BCUC.
Register Read	The cumulative energy consumption for the meter, much like the display on a traditional electro-mechanical meter. See also Interval Read
Release	A set of defined functionality that will be delivered as a sub-project within the SMI Program. Examples of releases within the SMI Program are "Release 1 – Mass Meter Deployment" and "Release 6 – Advanced Theft Detection".

S

Smart Meter	An advanced, electronic solid-state meter that records consumption in more detail than a conventional electro-mechanical meter, and is capable of transmitting that information via a two-way telecommunications network into the customer premises and back to BC Hydro. It captures the amount of power that is consumed and when plus other events such as outages.
SMI	Smart Metering & Infrastructure Program The Smart Metering & Infrastructure plays a key role in modernizing BC Hydro's electricity grid. It involves the introduction of new digital smart meters and the supporting infrastructure.
SMNO	Smart Metering & Network Operations A team of people on the SMI Program who provide meter communications network operations, network polling, setup, execution and maintenance during delivery and will transition to the responsible BC Hydro operating group. This work stream will also support the Meter Data Management System and the Home Area Network.
Solution Integrator	The organization which provides end-to-end planning, design, test, data migration, implementation and reporting services for the delivery of a smart metering program. For BC Hydro's SMI Program, the Solution Integrator is Capgemini.

T

Telecommunications Network	All network components and services, including HAN, FAN, WAN, and any other networks required to deliver the SMI Program.
Time-of-Use Rates	Rates that provide a price signal to encourage customers to shift electricity use from peak periods of the day.

W

WAN	Wide Area Network The configuration (hardware, software, and telecommunications) used to transmit and receive data signals across BC Hydro's service territory, providing connectivity to LANs and applicable upstream meters on one end and applicable smart metering applications and devices on the other.
Web Portal	A web site that provides a single point of logon and a unified presentation later for the entire Smart Meter System. It provides BC Hydro customers access to appropriate information in a safe, secure and useable manner, and allows them to personalize certain services they require from BC Hydro.