SHARED SERVICES CAPITAL - INFORMATION TECHNOLOGY

1.0 INTRODUCTION

Information Technology ("IT") refers to computer systems (hardware, software and applications) that support business processes used by employees throughout Hydro One. IT infrastructure includes the voice and data telecommunication networks; data centre installations; and computer equipment (servers, computers, data storage devices, and printers). Staff access software applications and systems from offices, field locations and mobile devices using Hydro One's wide area network, local area networks or through Hydro One's virtual private network.

IT capital expenditures include hardware and software for projects and programs that each in total cost more than $2 million. IT investments are made in accordance with approved business strategies, follow the IT Governance process described in Exhibit C1, Tab 2, Schedule 9, and are subject to a formal review process.

2.0 IT CAPITAL EXPENDITURES

Table 1
Total IT Capital Expenditures ($ Millions)

Description	Historic			Bridge	Test		TX Allocation	
	2007	2008	2009	2010	2011	2012	2011	2012
Software Refresh & Maintenance	11.9	9.3	8.0	12.8	10.9	8.0	6.1	4.5
Minor Fixed Asset Program*	14.4	9.3	9.0	18.1	18.0	14.2	7.8	6.1
Development Programs	5.4	0.5	4.0	10.6	9.0	6.9	5.0	3.9
Total	**31.7**	**19.1**	**21.0**	**41.6**	**37.9**	**29.1**	**18.9**	**14.4**

* Cornerstone capital is shown in Exhibit D1, Tab 3, Schedule 7

Capital IT expenditures are undertaken as projects or programs to meet business requirements. Capital expenditures fall into 3 categories:

- Software Refresh and Maintenance programs ensure continued operations of the installed IT application infrastructure, and include costs related to upgrading existing operating systems.
- Minor Fixed Assets (MFA) programs ensure the continued operations of the installed IT hardware infrastructure. Expenses in this category address equipment needs generated by the growth in demand for IT services, capacity limitations and the replacement of end-of-life IT equipment and in the Telecom network. MFA includes desktop/notebook computing equipment, field tablet computers, mainframe and storage devices, servers, and peripherals and telecommunication infrastructure including switches, computer-telephony interfaces, etc.
- Development Programs ensure the replacement and/or upgrade of older and end-of-life applications and include investments in new applications. Replacement of applications occurs when the applications have become inadequate for current functional needs or where the version is no longer supported by the vendor. Upgrades are undertaken to address legislative changes or market driven initiatives or to modify the application to better support an evolving business capability. New applications are added to address business needs and to support existing or new business processes**.**

Hydro One has established general architecture principles for all of its applications. These are:

- Applications will be "off the shelf" and will be maintained in a vendor supported version. Existing custom applications will be migrated to "off the shelf" solutions wherever possible.
- There will be fewer applications rather than more.
- Middleware, such as Oracle's BEA enterprise service bus, will be used as appropriate to facilitate application interconnectivity. Hydro One has already invested in creating this middleware or Service Oriented Architecture ("SOA") to enable data integration within and between applications.

- Systems architecture and chosen applications will be:
  a. robust (generally understood to mean unlikely to fail, but rapid response if it does)
  b. secure (generally understood to mean server-hardened, monitored, fire-walled and password protected)
  c. flexible service oriented architecture (generally accepted as the most appropriate and efficient data integration method).
- System hardware will be upgraded as required to support new applications and will be vendor supported.
- Costs will be managed on a total cost of operations basis.

IT has also developed and is implementing an Enterprise Strategy to replace the existing best of breed and customized enterprise applications which are approaching end of life. The strategy envisions an integrated suite of applications which allow for interconnectivity and interflow of financial and operations data (Cornerstone) which can then be used by the business to support work processes. Applications will be implemented "off the shelf" and applications will be maintained up to date to allow the business to make use of vendor enhancements and improvements. New applications will, wherever practical, interface with the Enterprise systems to allow for the transfer of data and to ensure cross-corporate data visibility.

The major planned IT capital projects which will be funded in 2010, 2011 and 2012 are described below.

2.1 Software Maintenance and Refresh Programs

Table 2
Software Refresh and Maintenance Program Capital Expenditures
($ Millions)

Description	Historic			Bridge	Test		TX Allocation	
	2007	2008	2009	2010	2011	2012	2011	2012
Software Refresh & Maintenance	11.9	9.3	8.0	12.8	10.9	8.0	6.1	4.5
Total	**11.9**	**9.3**	**8.0**	**12.8**	**10.9**	**8.0**	**6.1**	**4.5**

Hydro One utilizes just over 970 software applications in order to equip its employees with the required technologies to perform their tasks efficiently and safely. The software refresh and maintenance program provides the needed software vendors' releases, periodic version upgrades, and replacements of activity-focused applications that each meet the total capital threshold of $2 million aggregated. Included in these costs are applications and operating systems that support integrated enterprise systems such as OMS, WEP, SAP, etc.

Applications are replaced or upgraded with the line of business involvement to ensure applications remain compatible with current IT platforms and other interfacing applications. In this manner, vendor support is maintained to help fix breakdowns or other issues that may occur with the application. Funding decisions are made based on software lifecycles, vendor schedules, reliability requirements, and experience with similar initiatives/projects.

The cost increase in 2010 is mainly attributed to required upgrades and/or modifications to a number of legacy applications due to the Haromized Sales Tax (HST) regulation that comes into effect in July 2010. Included in 2011 are the implementation of enterprise content management and collaboration tools, further IT security access control and monitoring capabilities, upgrading the desktop operating system to Windows 7, anti-virus software upgrades and improvements to

the disaster recovery platform. In 2012, planned costs include: working towards a Microsoft Office 2010 rollout, Windows Server 2012 rollout, IT security additions to centralized logging and event management; expansion of event detection capabilities; and further investment in BEA middleware components for integration of SAP and other applications.

2.2 Minor Fixed Assets

Minor Fixed Asset investments are for IT hardware and include specific programs to refresh aging hardware such as personal computers, servers and mainframes. Equipment is refreshed based on its age and the nature of the applications running on the hardware. Equipment may be upgraded, or improvements may be made to extend hardware functionality. Hydro One's strategy is to minimize the costs of ownership, ensure operations risk is kept at an acceptable level, and to maintain functionality and security. Planned funding is based on equipment lifecycles. This work is broken down into the categories shown in Table 3 below.

Table 3
Minor Fixed Asset Program Capital Expenditures
($ Millions)

Description	Historic			Bridge	Test		TX Allocation	
	2007	2008	2009	2010	2011	2012	2011	2012
IT Mainframe, Servers and Storage	8.4	1.6	2.1	4.3	7.5	6.8	3.3	2.9
IT Desktops, Laptops, Tablets, Printers and Plotters	4.8	5.2	3.4	5.8	6.2	4.2	2.7	1.8
Telecom Networks and PBX/Voicemail	1.2	2.5	3.5	8.0	4.3	3.2	1.8	1.4
Total	**14.4**	**9.3**	**9.0**	**18.1**	**18.0**	**14.2**	**7.8**	**6.1**

2.2.1 MFA: IT Mainframe, Servers and Storage Sustainment program

This investment is required to respond to and manage annual growth in demand for additional IT processing and storage capacity and to address end of life issues with the existing Unix and Wintel servers.

Infrastructure servers are used to run business applications, networks, web services and email. Data storage devices are used by business applications and email to store and retrieve data. Servers and storage devices reach capacity over time and reach their vendor's end-of-support-life at which time they require upgrading or replacement to increase capacity or to ensure cost efficient maintenance that minimizes or eliminates down time. In determining when systems require replacement, the functionality and operating and maintenance costs are assessed. Hardware upgrades are needed to maintain reliable service for business applications.

The funding for the mainframe, servers and storage refresh program varies year to year depending upon hardware lifecycles and business requirements for increased processing capacity.

IT servers follow a four to five year lifecycle. In 2006/2007, the Microsoft XP Upgrade project required the replacement of a large quantity of servers that are now targeted for lifecycle refresh in 2011. This will accommodate the lifecycle refresh of end of life servers and the anticipated growth in demand for new server resources. The lifecycle refresh continues in 2012 with an additional 25% of Wintel servers and an estimated 15% of Unix servers.

2.2.2 MFA: IT Desktops, Laptops, Tablets, Printers, and Plotters Sustainment Program

Desktop and laptop computers are used by most Hydro One staff for office productivity applications such as email, word processing, spreadsheet, presentation, and personal databases,

and for business applications. Rugged tablet computers are used by field staff. Tablets are used with Geospatial Information Systems ("GIS") applications for undertaking systems design work and for asset condition assessments. Plotters are used by Hydro One engineering and operations staff for design work and to plot systems maps.

Hardware upgrades are required to accommodate new software requirements, to replace end of life equipment, to address warranty considerations and to maintain hardware reliability. Personal computer purchases also reflect projected increases in headcount.

Properly planned equipment refresh can maintain or reduce maintenance costs. Hardware costs tend to increase with age, especially when the hardware is no longer supported under vendor warranty. Hydro One's practice is to replace desktop and laptop computers every three to five years, and printers and plotters every four to five years. The renewal timeline is consistent with industry practice as identified by Gartner industry benchmarking studies. In practice, the refresh cycle has been slightly longer but has been consistent with maintaining functionality and minimizing maintenance costs.

The funding for desktops, laptops, tablets, printers, and plotters varies year to year depending upon hardware lifecycles, business needs and forecasted headcount increases. 2011 costs also include increased hardware requirements to accommodate the planned upgrade to Microsoft Windows 7 and the upgrade of Microsoft office tools. The hardware spend in 2010 and 2011 is to bring the current client technology hardware (laptops, desktops, tablets, etc) inline to support the migration to the Microsoft Windows 7 upgrade, reducing the refresh demands for the 2012 year.

2.2.3 MFA: Telecom Networks and PBX/Voicemail Sustainment program

The telecom assets of Hydro One are varied and have a large range of install dates, and lifecycle dates. The business telecom network is used to transmit data required to run business applications, for email, and for web sites. Voice or data network improvements or replacements are undertaken as part of an ongoing network management program. The objective is to improve network efficiency and to ensure equipment is current and supported by third party vendors.

Voice and data communications are used by the business daily to plan and carryout work and are especially important during storm periods. Projects regularly undertaken include rewiring local area networks ("LAN"), replacing end of life data network switches and routers, upgrading telephone Private Branch Exchange ("PBX") switches, replacing un-interruptible power source ("UPS") system, and upgrading the security solutions for external interfaces.

PBX/Voicemail hardware includes PBX and key set telephone switches, and voice mail equipment used to provide business telephone services to Hydro One employees at central and field locations throughout the province. Investments vary depending on the opening, closing or consolidation of offices.

Within the Hydro One voice and data network there are more than 800 routers/switches and hubs that connect to 74 PBX's and 35 Norstar/BCM smaller multi-line office sets that support more than 155 locations across the province. A majority of the routers/switches and hubs are reaching end of life.

The investment in Networks and PBX/Voicemail is undertaken to replace end-of-life assets and to maintain service reliability and security. The strategy is to replace equipment that is no longer supported by vendors. For network equipment the refresh occurs about every five years for network related hardware and about every ten years for PBX/Voicemail equipment.

The funding for Networks and PBX/Voicemail varies year to year depending upon hardware lifecycle refreshes, business needs for increased bandwidth and available market resources.

2010 planned costs include: growth in the telecom infrastructure; initiation of a 4 year voice system upgrade which includes migration of 25% of the end of life Meridian Mail systems to Call Pilot; local area network wireless expansion; branch office router upgrades; Telecom Disaster/Recovery enhancements; and GTA network upgrades. On a year-to-year comparison, the higher 2010 costs in this category are attributed to the branch office router upgrades which begin and end in 2010 and upfront costs associated with the voice system IP telephony upgrades. 2011 and 2012 costs represent the continuation of the second and third year upgrade to these programs along with the commencement of a corporate local area network 4-year (2010-2014) refresh program.

2.3 Development Projects

As previously noted, development projects include the cost for new applications or the replacement of end of life applications. Costs for IT development projects are detailed in Table 4 below.

Table 4
IT Development Projects Capital Expenditures
($ Millions)

Description	Historic			Bridge	Test		TX Allocation	
	2007	2008	2009	2010	2011	2012	2011	2012
CIS/CSS Hybrid Upgrades/CRM	2.9	0.3	0.2	-	-	-	-	
CTI Upgrades	0.7	(0.3)[1]	-	-	-	-	-	
ACPi/WEP	0.9	0.0	-	-	-	-	-	
IREIS	-			-	-	-	-	
Mobile IT	-		1.0	2.5	3.0	2.0	1.7	1.1
Asset Mgmt & Data Collection	0.9	-	-	-	-		-	
Warehouse Bar Coding	-	0.0	0.4	1.0	-		-	
eCustomer Self-Service Web Site	-	-	1.9	1.5	-		-	
Enterprise GIS Program	-	-	-	5.4	6.0	4.9	3.3	2.8
DX Asset Information System	-	0.5	0.5	0.2	-		-	
Total	**5.4**	**0.5**	**4.0**	**10.6**	**9.0**	**6.9**	**5.0**	**3.9**

[1]: represents vendor credit

2.3.1 Mobile IT

Mobile IT (total of $5.0 million to be spent over 2011 through 2012) is intended to equip field staff with the tools required to access current asset data applications including SAP, GIS and work order dispatch applications. This project supports the Company's response to staff and vehicle location safety needs, Smart Grid and Smart Metering initiatives and supports the implementation of "off the shelf" data collection tools for SAP and other enterprise systems which require data to be collected and reported from the field.

Hydro One is implementing a mobile software application which will be the standard enterprise mobile tool for data collection and work status reporting and will also interface with the GIS and SAP systems. The applications will work in a connected (real time) or disconnected mode depending on the nature of the work being performed. The intent is to be able to make this information available to the enterprise systems for asset data and work status record updating and further analysis. The application was selected in 2009 and system as well as business process integration is spanning 2010 through 2012 in manageable phases. The first phase includes enabling Stations Maintenance crews to collect their inspection data for loading into SAP to enable reliability-centered maintenance. Enablement within Customer Operations will follow to support their ongoing asset management and data collection

2.3.2 Warehouse Bar Coding

This investment is required to provide an enterprise wide solution for automating the inventory management activities for the Barrie warehouse, central maintenance shop and the meter shop to ensure accuracy of data collection and reduction in manual data entry. Improvements in accuracy and timeliness of entry will result in more accurate inventory records, and fewer inventory adjustments.

2.3.3 eCustomer Self Service Web Site

This investment will improve and enhance the existing self service web site applications including the ability for customers to: sign-up for pre-authorized payments in accordance with the Canadian Payments Association new regulations; make payment arrangements when in arrears; sign-up for pre-authorized payments; complete high bill enquiry walkthroughs; connect directly to an Agent for further assistance; receive a callback via the Virtual Hold function.

This electronic communication channel enables customers to serve themselves when electricity usage data becomes available on a daily basis with the implementation of automated meter reading and time of use ("TOU") billing. This investment will allow for the alignment of smart metering and TOU requirements using a solution that is seamless to the end user.

2.3.4 Enterprise GIS Program

Geospatial technology is a key infrastructure that enables a variety of business processes including design, transmission and distribution planning, outage management, work management, real estate and others. Geospatial technology and the underlying connected network model is also a key component required to support the benefits achieved from smart grid initiatives.

This program will result in a single system of record comprising the location and connectivity of both transmission and distribution assets (GIS is the only technology that fully supports both logical connectivity and physical location of assets) as well as properties. It will: facilitate planning and outage management; support mobile workforce management through intelligent crew routing and automated vehicle location ("AVL"); manage real estate records and Hydro One property; and provide the underpinnings of smart grid applications such as FLISR (fault location, isolation and service restoration, which minimizes the outage impact to customers) and VVO (volt var optimization, which provides a consistent quality of service while achieving efficiency through voltage reduction).

The GIS Program will also enable integration to other critical business systems such as SAP, distribution planning with CYME, outage management with ORMS, or next-generation DMS. It entails completing the conversion of Dx asset data, reconciling the data and business processes, and updating the GIS infrastructure, particularly software applications.

2.3.5 DX Asset Information System

The objective of this investment is to establish technology and infrastructure allowing for collection of the data related to Dx Assets, migration of this data to the GIS environment and post-migration editing of the data in order to build connectivity, populate missing attributes and verify reliability of the data. This is a multi-year process, the purpose of which is to create a complete and reliable spatial dataset supporting crucial business initiatives such as Outage Management, Work Program Planning, etc.