BUSINESS PLANNING AND BENCHMARKING - REGULATED HYDROELECTRIC

1.0 PURPOSE

This evidence presents the regulated hydroelectric business plan and benchmarking and provides a summary of the regulated hydroelectric operating costs.

2.0 OVERVIEW

A summary of the operating costs that form part of the regulated hydroelectric revenue requirement is presented in Ex. F1-T1-S1 Table 1. The regulated hydroelectric forecasts for the test period are from OPG's 2010 - 2014 business plan for the regulated hydroelectric facilities. Section 3.0 presents the regulated hydroelectric performance targets and section 4.0 presents the regulated hydroelectric benchmarking results.

The Hydroelectric business plan is prepared annually as part of the corporate business planning and budgeting process described in Ex. A2-T2-S1. The Hydroelectric business planning process is focused on identifying the initiatives and resources required to achieve safety, operational, financial, and new development objectives for the hydroelectric business. These business unit objectives, described in section 3 of Ex. A1-T4-S2, are consistent with OPG's mandate and corporate objectives.

The 2010 - 2014 Hydroelectric business plan as it relates to the regulated hydroelectric facilities is provided in Attachment 1. Discussion of specific initiatives contained in the business plan and their impact on operational and financial performance can be found in the evidence on base OM&A (Ex. F1-T2-S1), project OM&A (Ex. F1-T3-S1), capital projects (Ex. D1-T1-S1), and the production forecast (Ex. E1-T1-S1).

The Hydroelectric business planning process begins in early May of each year with internal reviews of the current planning framework, the confirmation and updating of business objectives and priorities, a review of business planning instructions from

Finance, a review of the status of operational and performance plans and related capital and OM&A expenditures, a review of benchmarking “best practices” and comparisons, and the identification of emerging issues. Out of this process, strategic and performance objectives and guidelines for Hydroelectric are determined, prioritized and finalized.

OM&A and capital guidelines are established for each plant and central office group in May. The starting point for the guidelines is based on the previous year’s business plan. In response to the poor financial environment expected going forward and to align with the 2010 corporate cost reduction objectives, plant and central office groups were directed to be aggressive in managing their costs while maintaining their critical safety, environmental, and performance objectives. The Hydroelectric business was asked to contribute $5M to the overall OPG cost reduction target of $85M described in Ex. A2-T2-S1. The regulated stations were allocated $1.2M (25 per cent) of the total $5M Hydroelectric cost reduction.

A business planning meeting is held in mid-May with asset management and finance stakeholders from each plant group and central office groups, and certain corporate groups. The 2010 - 2014 meeting agenda included corporate planning context and financial challenges, business planning schedule, Hydroelectric financial guidelines and cost reduction initiatives, staffing initiatives to address demographic and emerging work requirements, energy production and outage planning, and review of the Hydroelectric portfolio management system and corporate risk management process. The key business planning issues are also discussed at the monthly Hydroelectric Management Team meetings in May through October.

The plant and central office groups develop their detailed business plans during June/July, and submit them to the Executive Vice President Hydroelectric (“EVP – Hydroelectric”) at the end of July. The Business Support and Regulatory Affairs Division performs a thorough review and challenge of each business plan. The business plans are consolidated into a preliminary Hydroelectric Business Plan for review by the EVP - Hydroelectric in early August. Redirection is provided to specific plant groups as

required. A formal review meeting is subsequently held at each plant group location where the local plant group management presents their business plan to the EVP - Hydroelectric and members of the Hydroelectric Management Team for preliminary approval. The preliminary Hydroelectric Business Plan is then modified as required and submitted for review by the President and Chief Executive Officer ("CEO"), and the Chief Financial Officer ("CFO"). Changes are made per the direction of the CEO (if required) prior to its final submission to the OPG Board of Directors, as discussed at Ex A2-T2-S1.

The key approaches used to identify and prioritize investment and base work program requirements in support of regulated hydroelectric's objectives are described below.

Portfolio Approach to Investment Management

Hydroelectric uses a structured portfolio approach to identify and prioritize projects for its investment program. Annual engineering reviews and plant condition assessments (conducted on a cycle of approximately seven to ten years) are performed to determine short-term and long-term expenditure requirements to sustain or improve each facility, and ensure continued safe operation. These may be followed by the preparation of a facility life cycle plan, which is performed on an as-needed basis for marginal assets or assets requiring significant expenditures relative to the value of the facility. This planning approach is designed to identify necessary capital, operating and maintenance expenditures for each facility, and direct limited corporate funds at the facilities that can best maintain or enhance the value of the hydroelectric business and OPG. The cornerstone of this approach is that safety, environmental, and other regulatory programs are of the highest priority compared to production and reliability initiatives.

Streamlined Reliability Centred Maintenance Process

Hydroelectric uses a process known as streamlined reliability centred maintenance process to optimize the preventive maintenance program at its facilities. The streamlined reliability centred maintenance process provides a consistent method of identifying, scheduling and executing maintenance activities. The concept of streamlined reliability centred maintenance dictates that the type and frequency of preventive maintenance

applied to an individual component is determined based on the nature and consequences of failure (i.e., balance of cost versus risk). By focusing maintenance and associated support resources appropriately, Hydroelectric has been able to accomplish more of its base work program (including additional regulatory requirements), while minimizing the need for additional resources.

3.0 HYDROELECTRIC KEY PERFORMANCE TARGETS

Hydroelectric establishes performance targets to support its business objectives as part of the business planning process. Benchmarking, as discussed in section 4.0, is one tool used in target setting and Hydroelectric generally benchmarks its performance against these targets.

Hydroelectric performance targets are established on the basis of the following factors:

- Historical performance trends
- Age and condition of facilities
- Major outages and project investments (OM&A and capital) identified in inspections, engineering reviews and plant condition assessments
- Recent major investments to improve reliability
- Comparison with external benchmarking results and “best practices”
- Continuous improvement considerations

Targets are monitored and compared to actual data as the year progresses. Targets are established for the following measures:

Availability

Availability is a measure of the reliability of a generating unit represented by the percentage of time the unit is capable of providing service, whether or not it is actually in-service, relative to the total hours for the period in question (typically 8,760 hours in a year). It is determined by the following equation: Availability = 100 per cent – Incapability Factor (“ICbF”), where ICbF is a measure of the incapability of a unit to generate over

the period in question. Incapability factor is defined as the ratio of scheduled and unscheduled outage hours and adjusted derating hours to the total hours in the period.

Equivalent Forced Outage Rate

Equivalent Forced Outage Rate ("EFOR") is an index of the reliability of the generating unit measured by the ratio of time a generating unit is forced out-of-service, including equivalent forced deratings, compared to the sum of the forced outages and deratings plus the of amount of time the generating unit operates.

OM&A Unit Energy Cost

OM&A unit energy cost measures the cost effectiveness of the hydroelectric generating stations. It is defined as total hydroelectric OM&A expense plus allocated central hydroelectric costs, divided by hydroelectric electricity generation. The gross revenue charge ("GRC") is excluded from this calculation because it is not within the direct control of OPG. The GRC is determined by O. Reg. 124/02 under the *Electricity Act, 1998* and is a function of energy produced and the price set by the Provincial Government.

Safety – Accident Severity Rate

OPG and the Hydroelectric Business Unit spend a significant amount of time and effort in training and awareness to ensure the safety of its employees. The accident severity rate is used as a key measure of safety performance both within Hydroelectric and across OPG. It is defined as the number of days lost by employees injured on the job divided by 200,000 hours worked. This measure is used by other electric utilities and is benchmarked by the Canadian Electrical Association ("CEA").

Environmental Performance

Hydroelectric uses an environmental performance index to measure the environmental performance of the regulated facilities. The environmental performance index consists of three main categories:

- Spills

- Regulatory compliance (e.g., regulatory infractions)
- Energy efficiency

3.1 Performance Targets

3.1.1 Availability and Equivalent Forced Outage Rate ("EFOR") - History and Targets

Chart 1 shows reliability targets and actual performance from 2007 - 2009 for each regulated plant and for the total of the regulated plants grouped together. Chart 2a and 2b show availability and EFOR targets, respectively from 2010 - 2012 calculated on the same basis as Chart 1. As part of the general objective of continuous improvement, the EFOR target of 1.3 per cent for 2010 - 2012 represents an improvement from the five year average of 1.4 per cent. The targets are better than the CEA and EUCG Inc. (formerly known as Electric Utility Cost Group) benchmarking averages. Availability targets fluctuate based on the planned outage program, as well as forced outages which cannot be predicted. In 2009, availability was better than target due to the deferral of some planned outages at DeCew Falls II, Sir Adam Beck I and Sir Adam Beck Pump Generating Station ("PGS"). Overall, availability is expected to improve in the long-run (after 2014) as the major outages for frequency conversions/rehabilitations of Sir Adam Beck I are completed.

Chart 1

Regulated Hydroelectric Facilities - History and Targets for Availability and EFOR

Measure	Name of Station/Grouping	2007 Target	2007 Actual	2008 Target	2008 Actual	2009 Target	2009 Actual	Notes
Availability Factor (%)	DeCew Falls II	75.1	77.6	93.4	96.9	91.8	97.3	Major outage and overhaul in 2007.
	SAB I	93.9	92.3	95.0	92.7	82.9	89.1	Major rehabilitation outages include G7 in 2008/2009 & G9 in 2009/2010.
	SAB II	96.0	96.9	96.9	97.4	97.0	96.7	Station rehabilitated and upgraded from 1996 to 2005.
	SAB PGS	89.7	86.1	81.1	79.2	77.8	84.5	Major unplanned rehab of G6 required in 2008/2009 due to small oil leak in turbine. The G3 unit outage was deferred in 2009 to perform detailed condition assessment..
	Saunders	95.3	97.3	96.4	95.8	96.4	95.7	Station rehabilitated and upgraded from 1992 to 2001.
	Aggregate of all 5 regulated plants (excl. DeCew Falls I)	93.8	94.1	94.4	93.8	92.7	93.6	
EFOR (%) (Reliability)	DeCew Falls II	1.1	1.0	1.1	0.8	1.1	0.2	
	SAB I	2.0	3.7	2.0	4.3	2.0	2.3	Unit 9 was on a permanent derating until rehab start in 2009
	SAB II	0.5	0.4	0.5	0.2	0.5	0.6	EFOR in 2009 increased due to defective main transformer bushings.
	SAB PGS	3.5	9.7	3.5	2.7	3.5	4.4	
	Saunders	0.6	0.0	0.6	1.1	0.6	0.1	
	Aggregate of all 5 regulated plants (excl. DeCew Falls I)	1.1	1.8	1.2	1.5	1.2	1.0	

Notes:

- High availability factor is good and low EFOR is good.
- The availability and EFOR of DeCew Falls I is not tracked since this is a “supplementary” station that basically utilizes the available water that is in excess of what can be utilized by the newer and more efficient DeCew Falls II station.
- The aggregate figures are calculated as a capacity-weighted average.

Chart 2a

Availability Targets (%)

	SAB I	SAB II	SAB PGS	DeCew Falls II	Total Niagara	Saunders	Total
2010	79.3	95.3	82.3	90.2	88.7	93.7	90.4
2011	84.2	96.6	76.3	93.2	89.5	94.2	91.1
2012	80.2	97.7	72.5	93.6	88.3	96.1	90.9

The "Total" column presents a capacity-weighted average of the five plants shown.

Chart 2b

EFOR Targets (%)

	SAB I	SAB II	SAB PGS	DeCew Falls II	Total Niagara	Saunders	Total
2010	3.5	0.2	4.8	2.6	1.8	0.4	1.3
2011	3.5	0.2	4.8	2.6	1.8	0.4	1.3
2012	3.5	0.2	4.8	2.6	1.8	0.4	1.3

The "Total" column presents a capacity-weighted average of the five plants shown.

3.1.2 OM&A Unit Energy Cost - History andTargets

Chart 2c shows OM&A unit energy cost targets for 2007 - 2012. These targets are calculated using planned OM&A expenditures (per business plan process described above) divided by the energy forecast for each year**.** From 2007 - 2009, the actual performance was better than target for both Niagara and R.H. Saunders mostly due to higher than expected energy production from higher water inflows. Future unit energy cost targets are in line with historical figures except in 2011 when increases in OM&A

expenditures for divestiture of bridges in Niagara and certain OM&A projects at R.H. Saunders increase the target slightly above historical levels.

Chart 2c

OM&A Unit Energy Cost Targets ($/MWh)

	Niagara Total	Saunders	Total
2007 Targets	4.4	2.5	3.7
2007 Actuals	3.9	2.1	3.2
2008 Targets	4.7	2.7	4.0
2008 Actuals	4.6	2.7	3.9
2009 Targets	4.5	2.6	3.8
2009 Actuals	4.6	2.3	3.7
2010 Targets	4.2	2.3	3.5
2011 Targets	4.9	2.6	4.1
2012 Targets	4.4	2.8	3.8

3.1.3 Safety - Accident Severity Rate - History and Targets

Chart 2d shows the accident severity rate actual performance and targets for 2007 - 2012. These targets are based on CEA and other benchmarking, as well as OPG's overall targets. It is important to note that the accident severity rate has been zero days lost/200,000 hours worked at Niagara Plant Group for the past six years and zero days lost/200,000 hours worked at R.H. Saunders for the past 11 years. This is excellent performance by any standard.

Chart 2d

Accident Severity Rate (number of days lost/200,000 hours worked)

	Total Niagara	Saunders	Total
2007 through 2009 (actual)	0	0	0
2010 through 2012 (target)	<4.5	<4.5	<4.5

3.1.4 Environmental Performance Index – History and Targets

Hydroelectric has a very good track record with regard to environmental performance. Environmental management systems have been in place since 2000 and are registered under the International Organization of Standardization ("ISO") 14001. The ISO 14001 registration ensures compliance with legal requirements and continual improvement of the environmental management system. Hydroelectric also has a number of environmental programs in place to manage priority environmental issues and risks.

In 2009, the Niagara Plant Group was designated as an Environmental Leader by the Ontario Ministry of Environment ("MOE"). They were the first group in the electricity sector to be designated as an Environmental Leader. The Niagara Plant Group has also been recognized and certified by the Wildlife Habitat Council over the past four years for their various biodiversity programs. R.H. Saunders also received certification for their biodiversity initiatives by the Wildlife Habitat Council. In 2009, the eel ladder at R.H. Saunders was modified and improved by adding: a 300 metre extension upstream, a new surface that helps eels climb the ladder faster, and a cover for the ladder.

The environmental performance index ("EPI") includes a variety of measures and deliverables, some that are specific targets (such as minimizing the number of spills and MOE infractions) and some that are environmental enhancements (such as energy efficiency). The EPI target is 1.0. An EPI above 1.0 can only be achieved if the number of spills and infractions are less than target, and/or the number of energy efficiency initiatives is better than planned. For the regulated facilities, the actual EPI has been

better than the target of 1.0 from 2007 to 2009. The EPI target for 2010 - 2012 continues to be 1.0.

4.0 REGULATED HYDROELECTRIC FACILITIES BENCHMARKING

Hydroelectric benchmarks reliability, cost and safety performance with comparable businesses to assess and understand the performance of its stations, as well as to identify and share best practices and opportunities for improvement.

Benchmarking data provides a starting point to compare the costs and reliability of OPG's regulated hydroelectric facilities to those of other hydroelectric facility owners. Because of the differing geographic locations and distribution of the plants, as well as differences in regulatory regimes, absolute comparisons cannot be made directly between the regulated hydroelectric station costs and those of other utilities. In addition, the following factors can result in differences in cost and reliability benchmarking comparisons that cannot be explained or corrected through differences in best practices:

- Specifics of a station's design, unit size and site configuration
- The number of, type of and physical dimensions of its dams
- The way the station has historically been operated and maintained
- The station/equipment age and condition
- Water conditions (i.e., flows and water levels) and the resulting production

For these reasons, benchmarking results for individual plants should only be used as a guide in making comparisons and to determine best practices towards the goal of achieving continuous improvement and cost efficiencies.

Hydroelectric reviews benchmarking results and best practices annually as part of the business planning process described earlier in this exhibit and applies any new practices and associated cost reductions as appropriate. Hydroelectric also has participated in informal benchmarking activities with various utilities in the past to identify actions that ultimately may result in costs efficiencies, and operational and maintenance improvements. During the past ten years, Hydroelectric has incorporated best practices

that have resulted in cost savings. These savings continue to be embedded in future base OM&A business plans and budgets. Examples of best practices that have been implemented include:

- Consolidation of operating centres
- Station automation
- Use of risk-based versus time-based maintenance approach (streamlined reliability-centred maintenance)
- Overtime reductions from 15 per cent of labour cost (in 2001) to under 6 per cent (in 2009)
- Skill broadening (trades learn more than one discipline)
- Implementation of "lead plant" concept in 2002 (for details, see Ex. A1-T4-S2)

Hydroelectric uses three main sources for benchmarking:

- EUCG Inc. ("EUCG", formerly known as Electric Utility Cost Group)
- Canadian Electrical Association ("CEA")
- Navigant Consulting (which acquired Haddon Jackson Associates, specialists in hydroelectric benchmarking, in 2007). Hydroelectric staff also attend a Benchmarking Review and Best Practices Workshop held by Navigant Consulting annually

<u>EUCG and CEA Reliability Benchmarking</u>

Hydroelectric has participated in the Generation Equipment Reliability Information System benchmarking programs carried out by the EUCG and the CEA since the mid 1990s. EUCG benchmarking includes participation by Canadian and American utilities, including Manitoba Hydro, New Brunswick Power, Pacific Gas & Electric, U.S. Army Corps of Engineers, Tennessee Valley Authority, Seattle City and Light, and Bonneville Power Authority. For this benchmarking, the data are not aggregated, thus individual OPG plants can be compared to the individual plants in the entire group (i.e., "quartile" analysis can be done). Nine Canadian utilities participate in the CEA benchmarking, including Hydro-Quebec, Manitoba Hydro, BC Hydro, Churchill Falls, Newfoundland and Labrador Hydro, Nova Scotia Power, Saskatchewan Power, Alcan and Aquila. The CEA

benchmarking is done on an aggregate basis by utility. OPG plants (aggregated) are compared to the aggregate of the plants in the entire group of utilities.

Benchmarking results for reliability, cost and safety are presented below.

4.1 Equivalent Forced Outage Rate and Availability

Hydroelectric benchmarks the reliability indicators of Equipment Forced Outage Rate ("EFOR") and availability using data from the EUCG and CEA. The results of the 2006 - 2009 reliability benchmarking of the regulated hydroelectric facilities are presented in the two charts below.

Chart 3a

EUCG Reliability Benchmarking

Measure	Name of Station/ Grouping	Value In 2006 & Quartile	Value In 2007 & Quartile	Value In 2008 & Quartile	Value In 2009 (EUCG Benchmarking Not Available)
Availability Factor (%)	DeCew Falls II	64.4 (Q4)	77.6 (Q4)	96.9 (Q1)	97.3
	SAB I	91.8 (Q2)	92.3 (Q2)	92.7 (Q2)	89.1
	SAB II	97.3 (Q1)	96.9 (Q1)	97.4 (Q1)	96.7
	SAB PGS	90.7 (Q3)	86.1 (Q4)	79.2 (Q4)	84.5
	Saunders	97.4 (Q1)	97.3 (Q1)	95.8 (Q2)	95.7
Equivalent Forced Outage Rate (Reliability) (%)	DeCew Falls II	17.2 (Q4)	1.0 (Q3)	0.8 (Q2)	0.2
	SAB I	3.2 (Q3)	3.7 (Q3)	4.3 (Q3)	2.3
	SAB II	0.1 (Q1)	0.4 (Q1)	0.2 (Q1)	0.6
	SAB PGS	2.0 (Q3)	9.7 (Q4)	2.7 (Q3)	4.4
	Saunders	0.0 (Q1)	0.0 (Q1)	1.1 (Q3)	0.1

Notes:

- EUCG includes 244 stations/925 units.
- High availability is good and low forced outage rate is good.
- Q1 means that a station is in the top/best quartile of the benchmarked EUCG stations.

Chart 3b

CEA Reliability Benchmarking

Measure	Name of Station/Grouping	Value In 2006	Value In 2007	Value In 2008	Value In 2009
Availability Factor (%)	Availability CEA (excluding OPG)	89.6	91.3	Not Available	Not Available
	Aggregate of all 5 OPG large plants (including Beck PGS)	94.2	94.1	93.8	93.6
Equivalent Forced Outage Rate (Reliability) (%)	Forced Outage Rate CEA (excluding OPG)	2.7	3.3	Not Available	Not Available
	Aggregate of all 5 OPG large plants (including Beck PGS)	1.5	1.8	1.5	1.0

Notes:

- CEA benchmarking includes 692 generating units.
- High availability is good and low EFOR is good.

The above data demonstrates that the availability and reliability for the individual regulated facilities and the regulated facilities in aggregate, is generally better than (i.e., in upper two quartiles) the EUCG and CEA benchmarks. Sir Adam Beck PGS is included in the OPG data for completeness. This station is inherently less reliable than conventional hydroelectric and the newer, higher capacity pumped storage stations, due to its older, technically complex, reversible pump turbine design, and its multi-faceted role in the electricity system (e.g., pumping, generation, automatic generation control, and water diversion control). To accomplish this role, more frequent stops and starts are required than conventional stations, leading to more wear and tear on the equipment.

The two largest plants, Sir Adam Beck II and R.H. Saunders, were generally in the upper two quartiles for both availability and EFOR from 2006 - 2008. The Sir Adam Beck II's EFOR from 2006 - 2008 ranged between 0.1 per cent and 0.4 per cent and was in the top quartile in each year, which constitutes excellent performance. The performance of R.H. Saunders has generally been very good during the 2006 - 2008 period, but in 2008 the EFOR deteriorated to 1.1 per cent (third quartile) due to a generator failure of Unit G8. The availability in 2008 was still very good at 95.8 per cent (second quartile). In 2009 availability remained high, and the EFOR returned to exceptionally low level of 0.1 per cent.

In 2006 and 2007, DeCew Falls II had below average availability performance due to long planned outages to rehabilitate the two units and improve performance. The outage program started in 2005 and was completed in 2007. The reliability of this station improved in 2008 and 2009 as expected. The availability has improved from 77.6 per cent (Q4) in 2007 to 96.9 per cent (Q1) in 2008 and 97.3 per cent in 2009. The EFOR has also significantly improved from the poor level experienced in 2006 as the operational problems, which were prevalent from 2000 - 2006, were corrected by the overhauls performed in 2006 and 2007.

With regard to Sir Adam Beck I, performance is below average (especially EFOR) for its peer group due to the age and poor condition of most of the units. Rehabilitation of the Sir Adam Beck I units was started in 2007 when Unit G7 was rehabilitated, upgraded and converted from 25 to 60 Hz. This major work was successfully completed in mid-2009. The remaining two 25 Hz units and the frequency converter have been permanently shut down with the end of the 25 Hz system in the Niagara/Hamilton Region. The rehabilitation at Sir Adam Beck I units continues with Unit G9, which was derated for several years. Unit G9 was removed from service in mid-2009. The reliability of the station is expected to improve after the remaining operating units are rehabilitated and upgraded.

Sir Adam Beck PGS's availability and reliability has generally been in the third and fourth quartiles between 2006 and 2008. Since the station is unique in its technical design, vintage and role, there are no real comparators in the EUCG database for PGS. The reliability comparisons with the rest of the EUCG stations have been included in the chart above for information purposes only. In 2006, Sir Adam Beck PGS's availability (90.7 per cent) was reasonable and the EFOR (2.0 per cent) was very good. However, availability and EFOR deteriorated in 2007 and 2008. This was due to the failure of the governor oil pumps on Unit 4, and leaks in the servo/governor oil system and main shaft of Unit 6 (an environmental, not operational issue). In-situ weld repairs and other repairs were attempted but not successful due to the difficult location of the leakage. Due to the complexity of the unit, and inability to perform repairs in-situ, the unit was dismantled and shipped to the manufacturer's facility in Montreal. The repairs and design improvements took over ten months to complete causing a significant reduction in availability, and increase in EFOR. The unit returned to service in March 2009, and its environmental and operational performance has been excellent.

As described above, availability targets are based on each individual station's outage plan and the five-year average EFOR. The overall EFOR target of 1.3 per cent for the regulated hydroelectric stations is based on continuous improvement from the 5 year average of 1.4 per cent. In contrast, the CEA benchmarks are over 2.5 per cent.

4.2 OM&A Unit Energy Cost

Hydroelectric benchmarks OM&A cost performance of its stations by participating in the Hydroelectric Generation Benchmarking Program that is carried out by Navigant Consulting. The Navigant benchmarking program includes a best practices and data review workshop held annually with participants. Hydroelectric also participates in the EUCG annual OM&A benchmarking program. As mentioned earlier, Hydroelectric has applied many best practices in the past ten years which have resulted in significant savings that are already embedded into business plans/budgets.

The Navigant Consulting benchmarking participants are predominantly from Canada (i.e., BC Hydro, Hydro-Quebec, Nova Scotia Power, Great Lakes Power, TransAlta Utilities, Newfoundland and Labrador Hydro) and the United States (i.e., Tennessee Valley Authority, U.S. Bureau of Reclamation, U.S. Army Corps of Engineers, Southern California Edison, Chelan County PUD). The hydroelectric stations in this group of utilities are diverse in size, type, location and age, and include a mix of run-of-the-river, peaking, and pumped storage stations.

Costs included in the Navigant Consulting benchmarking are operations, plant maintenance, waterways and dam and other maintenance, support (i.e., engineering, finance, corporate support) and public affairs and regulatory. Public affairs and regulatory costs include items such as water rentals and usage fees, gross revenue charge, major environmental costs such as fish/wildlife operations and studies, as well as special licensing fees (e.g., FERC re-licensing in the U.S.).

The study results are generally segmented into various peer groupings. Cost drivers used to determine peer groupings include unit/station sizes, number of units, and age.

The cost benchmarking data presented is for OM&A costs only (referred to as "Partial Function Costs" in the Navigant Program). Navigant Consulting also performs a Total Cost Analysis which includes public affairs and regulatory costs. These public affairs and regulatory costs, including Ontario's Gross Revenue Charge, are externally mandated and not within the control of a utility. Therefore, they are not relevant when assessing and benchmarking operations, maintenance and administration costs (which are generally within management control)[1].

The results of the Navigant Consulting and EUCG OM&A unit energy cost benchmarking programs are summarized below in Charts 4 and 5 respectively**.** The cost benchmarking results from 2006 - 2008 show that, collectively, the regulated facilities were in the top quartile.

[1] OPG excludes these costs from its Performance Targets, as indicated in Section 3.0.

The OM&A unit energy cost benchmarking demonstrates that OPG's regulated hydroelectric facilities are cost competitive, in addition to having very good reliability, safety and environmental performance. OM&A costs for the regulated hydroelectric facilities are a function of their age, condition and specific circumstance relative to their peer group. Reliable operation is achieved by effective maintenance, but this tends to place upward pressure on OM&A cost.

Chart 4

Navigant Consulting Hydroelectric Benchmarking Results

Measure	Name of Station/Grouping	2006	2007	2008	Comparison Details/Note for 2008	Source and Peer Group
OM&A Unit Energy Cost (USD/MWh) (OM&A defined by HJA)	DeCew Falls I	47.7 (Q4)	40.6 (Q4)	40.6 (Q4)	Q4 from 30.6 to 81.2	Haddon Jackson Associates (HJA): 25 micro plants (< 30 MW)
	DeCew Falls II	7.7 (Q3)	8.5 (Q4)	5.4 (Q3)	Q3 from 5.0 to 8.0	HJA: 42 medium plants (150 to 400 MW)
	SAB I	5.3 (Q4)	6.9 (Q4)	8.2 (Q4)	Q4 from 5.7 to 8.2	HJA: 13 med-large plants (400 to 700 MW)
	SAB II	1.6 (Q1)	1.5 (Q1)	1.4 (Q1)	Q1 from 0.6 to 1.9	HJA: 25 large plants (700 MW or more)
	SAB PGS	47.1 (Q4)	61.7 (Q4)	81.2 (Q4)	Q4 from 22.8 to 81.1	HJA: 15 PGS plants
	Saunders	2.1 (Q3)	2.4 (Q3)	2.5 (Q3)	Q3 from 2.2 to 3.6	HJA: 25 large plants (700 MW or more)
	5 OPG plants as above (Beck PGS excl'd)	2.6 (Q1)	2.8 (Q1)	3.3 (Q1)	Q1 from 0.6 to 3.8	HJA: 166 plants
	All 6 OPG plants (including Beck PGS)	2.9 (Q1)	3.2 (Q1)	3.3 (Q1)	Q1 from 0.6 to 4.0	HJA: 190 plants

Note:

The above unit energy costs are in U.S. dollars and include both hydroelectric common cost allocations and corporate cost allocations. Currency conversion is based on the official Bank of Canada average midpoint Canadian to U.S. exchange rates (2003 = .7135; 2004=.7683; 2005=.8253, 2006 = 0.8829, 2007 = 0.91934, 2008 = .9736)

Chart 5

EUCG Hydroelectric Benchmarking Results

2007-2008 Unit OM&A Cost Ranking - 241 (2008) plants including OPG plants.				
Station	**2007 OM&A USD/ MWh**	**2008 OM&A USD/ MWh**	**Comparison Details Note for 2008**	**2008 Rank/ Peer Group Count**
DeCew Falls II	8.0 (Q2)	5.6 (Q1)	Q1 from 3.2 to 7.1 USD/ MWh	# 10 out of 84 plants (100-500 MW)
SAB I	7.9 (Q2)	10.6 (Q2)	Q2 from 7.1 to 11.1 USD/ MWh	# 40 out of 84 plants (100-500 MW)
SAB II	1.8 (Q1)	2.0 (Q1/2)	Q1 from 1.0 to 2.0 USD/ MWh	# 5 out of 19 plants (500+ MW)
SAB PGS	55.2 (Q3/4)	86.0 (Q4)	Q4 from 48.8 to 86.0 USD/ MWh	# 6 out of 6 plants (P-G)
Saunders	2.1 (Q2)	2.8 (Q2)	Q2 from 2.0 to 7.2 USD/ MWh	# 7 out of 19 plants (500+ MW)
All 5 OPG plants	3.0 (Q1)	3.7 (Q1)	Q1 from 1.0 to 8.7 USD/ MWh	#5, 7, 25, 76, 211 out of 241 plants

Notes:

- 2008 Unit Production Costs for 241 plants including 30 OPG plants (5 regulated and 25 unregulated).
- DeCew Falls 1 is not included in EUCG Cost Benchmarking Program because EUCG does not benchmark units less than 10 MW)

The OM&A unit energy cost ranking for the regulated hydroelectric facilities is negatively impacted by the significant OM&A expenditures at the Sir Adam Beck stations and R.H. Saunders required to maintain and operate the Joint Works with NYPA (e.g., ice booms and ice breaking operations, International Control Dam, Iroquois Control Dam). These additional structures and activities are not typical of most of the generating stations that are benchmarked, and account for approximately $5M to $7M per year in OM&A costs (or 7 to 12 per cent of total annual OM&A costs for the regulated hydroelectric facilities). In 2010 and 2011, NYPA has increased OM&A project requirements by $2.4M and $1M respectively compared to the amounts that OPG projected in its 2009 - 2013 business plan.

Explanations of each generating station's ranking and its specific cost issues are provided below:

4.2.1 R.H. Saunders

In addition to the special Joint Works costs identified above, the relative OM&A costs at R.H. Saunders is higher than other plants in its peer group due to the following characteristics of the facility:

- There is a need for extensive instrumentation and ongoing monitoring of concrete "growth" associated with alkali-aggregate reaction at the station. Alkali-aggregate reaction is a chemical reaction within the concrete structure (between the cement and certain types of aggregate) resulting in concrete "growth". In the mid to late 1980's this growth led to major operational and structural problems. A major rehabilitation program was implemented in the 1990's to mitigate the effects of the concrete growth and restore operational reliability. The program included cutting "slots" between each of the 16 units using a special diamond wire technique, repairing the powerhouse structure, and replacing major mechanical and electrical equipment. It is difficult to estimate when the concrete growth will stop, thus the growth and the re-established joints between the units are being monitored. If it is determined in the future that the joints are "closing up" leading to operational problems, re-slotting of the units will be required. Based on monitoring to date, re-slotting will likely be required in the next four to seven years.

- R.H. Saunders has on-site operators for both operations and site security. Because R.H. Saunders is situated on the St. Lawrence River, which is transected by the international border with the United States, site presence is necessary to ensure security and public safety. The St. Lawrence - Franklin D. Roosevelt plant on the U.S. side (owned by NYPA) is connected to the R.H. Saunders plant. Local presence is also required to carry out our operational and maintenance commitments with respect to the Joint Works (including water control at the Iroquois Control Dam and annual installation and removal of ice booms), emergency preparedness, segregated mode of operation switching operations, and water transactions. Absent these unique circumstances, R.H. Saunders could be operated remotely from the control centre at Chenaux Generating Station (approximately 200 km away).

The above two major issues will likely not improve or change in the future, thus the R.H. Saunders OM&A ranking is expected to remain stable for the 2010 - 2012 period.

4.2.2 Sir Adam Beck I

The OM&A costs of Sir Adam Beck I are generally higher than median compared to its peer groups in both benchmarking studies (i.e., second quartile in EUCG and fourth quartile in Navigant) due to the following factors:

- The station is over 85 years old and the "power train" equipment has reached end of life and needs rehabilitation or replacement (condition varies with each unit).
- Until 2009, three of the ten units were 25 Hz units. The last two in-service 25 Hz units and the frequency converter were taken out-of-service at the end of April 2009. The Unit G7 conversion from 25 to 60 Hz and upgrade was completed within budget and schedule in 2009. The 25 Hz units generally required more maintenance than most 60 Hz units due to their very poor condition. Also, there were additional costs to maintain the additional frequency changer equipment which converted energy from 25 to 60 Hz and vice-versa, and the Niagara Transformer Station which was specifically required for the 25 Hz system.

The unit rehabilitation/upgrades, the removal of two 25 Hz units from service, and the shutdown of the Niagara Transformer Station and the frequency changer, are expected to gradually reduce OM&A costs at Sir Adam Beck I over the next five years. As such, the station's benchmarking performance is expected to improve after all the work is completed.

4.2.3 Sir Adam Beck II

Sir Adam Beck II is expected to remain in the top quartile of its peer group for the OM&A unit energy cost benchmark in the next five years. The 2008 Navigant benchmarking results also identified Sir Adam Beck II as a leading performer in maintenance costs per MWh versus service level (as measured by availability and EFOR) category. All 16 units at the station were upgraded with new more efficient equipment installed from 1996 -

2005. Thus, the excellent cost and reliability performance is expected to continue in 2010 - 2012.

4.2.4 Sir Adam Beck Pump Generating Station ("PGS")

Sir Adam Beck PGS costs are in the fourth quartile primarily due to the age and unique operation of the station relative to all other pumped storage stations. This plant is benchmarked with other pumped storage stations that are much more modern and less complex in design, have much larger units (i.e., economies of scale), and which operate differently than Sir Adam Beck PGS. In addition to its role in pumping water for use during peak periods (which is typical for PGS's), Sir Adam Beck PGS is used to: 1) control the cross-over elevation of the Sir Adam Beck canals, 2) assist in automatic generation control, and 3) provide for flexibility and optimization of operations at the Sir Adam Beck complex.

Due to this unique role, the units experience a high frequency of control actions leading to more wear and tear, and resulting maintenance. For example, in 2009, the Sir Adam Beck PGS was often fully dispatched to pump in order to mitigate surplus baseload generation conditions in Ontario and prevent or reduce nuclear maneuvering. These factors contribute to significantly higher OM&A unit energy costs compared to a conventional hydroelectric station or a typical pump generating station, as well as reduced availability and reliability.

4.2.5 DeCew Falls

The DeCew Falls I OM&A unit energy costs are in the third and fourth quartiles of the Navigant benchmarking results due to the very old age (109 years) of the plant, the condition of the plant and small unit sizes, which results in high maintenance costs per unit of energy produced. The steel penstocks have reached end of life and are being replaced. A detailed plant condition assessment and life cycle plan indicated rehabilitation of the existing plant was the best alternative. A major overhaul of some of the units is also planned to extend the life of the facility, which on completion can be expected to stabilize on-going maintenance costs.

With regard to DeCew Falls II, OM&A costs increased in 2006 and 2007 due to the major overhaul work performed on the units. This caused the ranking to decline from third quartile in 2005/2006 to fourth quartile in 2007. The overhaul program for DeCew Falls II was completed in mid-2007, thus major overhaul costs will no longer be incurred. Both the Navigant and EUCG cost benchmarking indicate that the station's OM&A cost performance has improved in 2008, compared to previous years.

4.3 Safety (Accident Severity Rate)

OPG and Hydroelectric spend a significant amount of time and effort on training and awareness to ensure the safety of its employees. Safety performance is benchmarked through the Canadian Electricity Association ("CEA"). The CEA collects safety performance data annually from its members who report their injury statistics based on the *CEA Standard for Recording and Measuring Occupational Injury Experience A-2*. The CEA now collects safety performance data from its members broken down into generation type (i.e., nuclear, fossil and hydroelectric).

In 2008, OPG's regulated hydroelectric Accident Severity Rate was zero and OPG ranked first out of the 5 CEA members with Hydro Businesses >200 employees.

LIST OF ATTACHMENTS

Attachment 1: Regulated Hydroelectric 2010 - 2014 Business Plan

Note: Attachment 1 is marked “Confidential” because the original document contains confidential information. The redacted version provided as pre-filed evidence is not confidential.

Hydro Generation Business Plan 2010 to 2014

Presentation to OPG Board of Directors

November 19, 2009

John Murphy
EVP Hydro

ONTARIO POWER GENERATION

OPG Confidential

Business Plan Outline

1. Setting the Context
   - The Assets
   - Age Profile & Re-Investment Frequencies
2. Major Initiatives
3. Performance and Cost Summary
4. Plan Over Plan Changes - OM&A & Capital
5. Hydroelectric Development Plan
6. Project Expenditures to Maintain and Improve Existing Assets
7. Project Expenditures – Safety and Environmental Programs
8. Runner Upgrade Program
9. Energy Production Plan
10. Reliability
11. Aboriginal Program
12. Demographics and Staffing Strategy/Plan
13. Benchmarking – OM&A Unit Energy Cost and Reliability
14. Key Business Risks

Appendix A – Additional Information

- Station Statistics
- Portfolio Classification and Project Prioritization System
- Capital Expenditures - History and Future
- Hydro Revenue, Cost, Staffing and Other Performance Information
- Year Over Year Changes
- Capacity Changes During Planning Period
- Energy Production Forecast – Impacts of Surplus Baseload Generation (Details)

Appendix B - Regulated Asset Information

Appendix C - Unregulated Asset Information

The Assets


RH Saunders GS

PEOPLE / WORK CENTRES / LAND

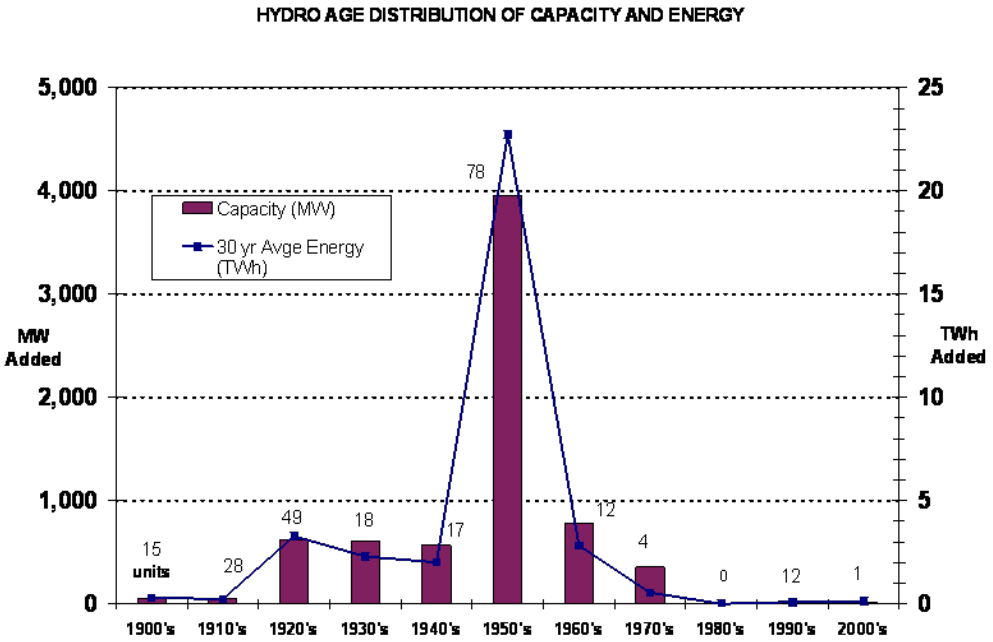
PLANT GROUPS	5
WORK CENTRES	22
CONTROL CENTRES (includes ICD)	7 (was 18 pre-1999)
TOTAL STAFF	~1060
OPERATORS	~100 (was 200 pre-1999)
NO. OF RIVER SYSTEMS	24
HYDRO OWNED LAND	~17,000 hectares
LEASED LAND (flooded)	~800, 000 hectares

STATIONS PROFILE

NO. OF STATIONS	65 (4 stations being redeveloped)
AVERAGE ENERGY	34.7 TWh
CAPACITY	6943 MW
AVERAGE AGE	70 yrs
NO. OF GENERATING UNITS	230
SMALLEST / LARGEST UNIT	1 MW / 137 MW
NO. OF DAMS	231
BOOK VALUE	$6.8 billion


Ragged Rapids GS

The Assets: Age Profile & Re-Investment Frequencies



STATION COMPONENTS	OVERHAUL / REPLACEMENT FREQUENCY (YEARS)										
	10	20	30	40	50	60	70	80	90	100	Range (M $)
GENERATORS											
rewind				■	■			■	■		0.5 to 4
TURBINES											
major overhaul (mechanical parts)				■	■			■	■		1 to 3
replace runners				■	■				■	■	1 to 5
PROTECTION & CONTROL											
replace				■	■				■	■	.5 to 5
SERVICE WATER & AUXILIARIES											
replace				■				■			0.4 to 10
HEADGATES / SLUICE GATES											
rebuild/replace				■	■				■	■	0.2 to 4
PENSTOCKS											
rebuild woodstave					■						7 to 15
replace steel										■	7 to 15
CRANES											
rebuild/replace				■				■			0.5 to 5
CIVIL STRUCTURES (BUILDINGS)											0.2 to 100
rebuild/replace					■				■	■	1 to 100
CIVIL STRUCTURES (DAMS)											
rebuild/replace				■	■			■	■	■	1 to 100
AQUADUCTS & TUNNELS											
rebuild/replace									■	■	30 to 1,600

LEGEND
Overhaul/Repair
Rebuild/Replace

- Average age of stations is 70 years.
- 70% of Hydro capacity built during the 1950's and 1960's.
- Equipment service lives range between 30 to 50 yrs.
- Structures such as dams, penstocks, powerhouses, canals, etc. typically require repairs every 25 to 50 years. Replacement of some civil components is required every 40 to 75 years (eg, wood stave penstocks, stop-logs, etc).
- There is risk of deteriorating performance and safety without significant continued re-investment (due to demographics of portfolio, and large number and variability of stations/units/equipment).
- Re-investment levels of about 1% to 3% per yr of "replacement cost" are considered reasonable by industry experts. Hydro has invested approximately 0.5% to 1.5% per yr of "replacement cost" in the past 10 years (excludes new facilities). Determination of appropriate investment levels should consider station/fleet age and condition, type of equipment, station role (peaking vs base), past investment strategy (eg, harvesting), reliability targets, etc.
- The Business Plan addresses the need to sustain and improve the existing assets for long term per the Hydro mandate. Plant Condition Assessment/Life Cycle Plans and Portfolio Approach to Asset Management used to determine and prioritize investments (Appendix A).

Major Initiatives

- Invest in New Hydroelectric Developments per Government Mandate
  - ✓Continue with construction of Niagara Tunnel, Upper Mattagami/Hound Chute and Healey Falls projects.
  - ✓Obtain approvals and start construction of Lower Mattagami project, [redacted]
- Re-invest in existing assets to maintain/improve their condition, reliability and efficiency
  - ✓Availability will range from 91.0% to 92.8%.
  - ✓EFOR target is 1.5% (proposed stretch target is 1.4%).
  - ✓Continue replacement/refurbishment civil infrastructure including dams, penstocks, and building envelopes.
  - ✓Continue rehabilitations/upgrades at major stations.
  - ✓Continue runner upgrade program (additional 66 MW of capacity and 144 GWh from 2010 to 2014).
  - ✓Increase/advance reinvestment in small hydro plants (eg, replace aging penstocks, gates, etc) to ensure continued long term safety and performance.
- Improve Dam and Public Safety through investments and improved processes:
  - ✓Rehabilitate/upgrade/repair civil works and maintain/improve safety of dams to address deterioration and deficiencies in ageing structures and sluice gates.
  - ✓Improve public safety through the addition of safety booms, fencing, signs, cameras, special structures at certain sites, and enhancement/integration of existing procedures.
  - ✓Increase Dam Safety Surveillance as per the recommendations of Independent Dam Safety Panel.
  - ✓Continue to participate in, and influence, the development of provincial regulations with the MNR.
  - ✓Develop and implement Geographic Information System (GIS).

Major Initiatives (cont'd)

- Invest In People
  Continue rejuvenation and training of Hydro workforce to address ageing demographics and new work associated with development projects and changing regulatory and internal governance requirements.

- Improve Accident Severity Rate and All Injury Rate and maintain registration in OHSAS 18001.

- Maintain/improve environmental performance in the area of spills risk management and containment testing, and maintain registration in ISO 14001

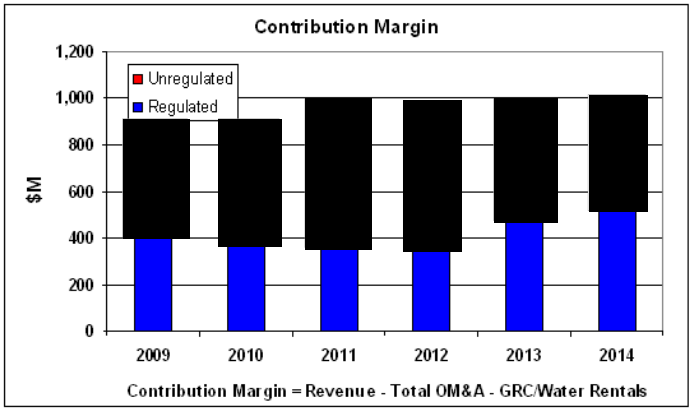
- Strengthen relationships with First Nations and Metis
  Build relationships, consult and partner with First Nations on new developments, and continue activities to support the Aboriginal Relations Policy

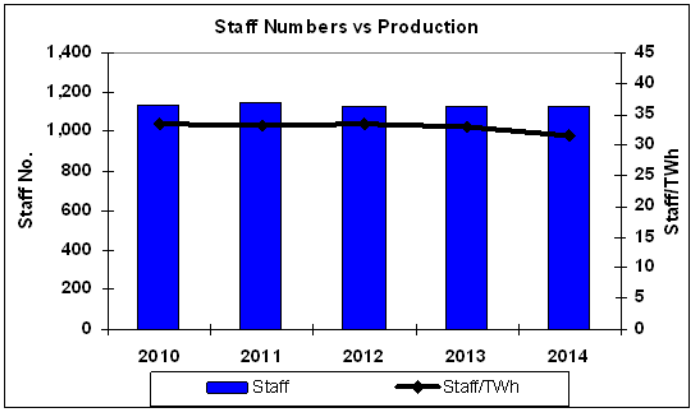
- Maintain/improve relationships with provincial and federal government agencies and community stakeholders (to maintain our rights to the "fuel" on the watersheds).

- Improve project planning and execution through enhancement of Project Management processes, systems, training and oversight.

[redacted]

Performance and Cost Summary





	2009 (Proj'n)	2010	2011	2012	2013	2014
PERFORMANCE MEASURES - OPERATIONS						
Capacity (MW)	6,943	6,995	7,000	6,966	7,228	7,484
Energy (TWh)	**36.1**	**34.1**	**34.4**	**33.8**	**34.4**	**36.0**
Availability (%)	**93.1**	**91.0**	**92.4**	**92.6**	**92.3**	**92.8**
Scheduled Outage Factor (%)	5.7	7.8	6.4	6.2	6.5	6.0
EFOR (%)	1.5	1.5	1.5	1.5	1.5	1.5
Spill Losses (Forced + Planned Outages) (GWh)	293	320	200	200	199	201
REVENUE ($M) *	[redacted]					
RESOURCES						
Base OM&A - Operations($M)	[redacted]					
Project OM&A - Operations ($M)						
OM&A - Hydroelectric Development ($M)						
TOTAL OM&A ($M)						
Capital - Operations ($M)						
Capital - Niagara Tunnel ($M)						
Capital - Upper Mattagami & Hound Chute ($M)						
Capital - Lower Mattagami ($M)						
Capital - Little Jackfish ($M)						
Capital - Other New Developments ($M)						
TOTAL CAPITAL ($M)						
Staff	1,077	1,138	1,144	1,130	1,131	1,132
GROSS REVENUE CHARGE/WATER RENTALS	**365**	**353**	**358**	**357**	**353**	**347**
CONTRIBUTION MARGIN ($M)	[redacted]					
PRODUCTION COSTS						
OM&A UEC ($/MWh)						
GRC/Water Rentals UEC ($/MWh)	10.1	10.3	10.4	10.6	10.3	9.6
PUEC ($/MWh)	[redacted]					
ENVIRONMENT	**Meet all Environmental Regulatory Limits & Targets**					
HEALTH & SAFETY	**Meet all Health and Safety Targets (ASR=4.5 & AIR=3)**					

* **HESA Revenues for Lac Seul, Upper Mattagami, Healey Falls and Lower Mattagami Developments are included.**

Highlights

- Increased capacity and energy from new development projects and runner upgrades.
- Average availability of 92.2% lower than 2009 due additional major planned outages, but still significantly better than external benchmarks.
- OM&A stable during business plan period (average of [redacted] per year).
- Capital costs increase due to new development projects (average of [redacted] per year).
- Revenue lower in first three years of plan with expected upside in 2013/2014 due to increased production and increased energy prices.
- OM&A Unit Energy Cost and Production Unit Energy Cost improves over the planning period.

OM&A - Plan Over Plan

Major Changes

- Some lower risk OM&A projects have been deferred from 2010 to later in planning period. Consulting and discretionary costs have been reduced to meet Cost Reduction Challenge.
- Modest staff additions to address demographics, additional project and regulatory requirements in operations, and increased dam safety surveillance.
- Central Hydro Plant Group organization will be strengthened and improvements will be made to managed systems, public safety, and project and maintenance management.
- NEPG and NWPG support staff added to assist in construction and ultimate operation of the Upper and Lower Mattagami projects.
- Niagara Bridge Divestiture Strategy: OPG has legal obligations to maintain and replace certain bridges at the end of their life. OPG will pay municipalities to replace these bridges and turnover all responsibility to the municipalities. This will eliminate future cost and legal liabilities associated with these bridges.
- Increases in Geographic Data System data acquisition (flight surveys and LIDAR) and mapping system costs.
- Reductions due to IFRS accounting changes (transfer SAVH from OM&A to Capital).
- Labour and payroll burden rates have been reduced.

OM&A - Plan Over Plan	2009 Proj'n	2010	2011	2012	2013
Last Year's Approved Plan ($M)					
Changes					
Corporate Reduction Challenge		-5.0			
Mechanical, Civil, Electrical Work Program (Reprioritization & Scope Change	1.2	-2.7	-5.6	-1.0	-1.5
Additional New Hires, Apprentices and Operators - Demographics		0.8	0.4	0.5	0.3
Plant Group Operations Support for Upper Mattagami, Lower Mattagami, Healey Falls and Little Jackfish					
New Hydro Development Project Increases (includes Pumped Storage)					
Niagara Bridge Replacement/Divestiture Program	4.0	1.8	6.9	0.0	0.0
Public Safety Increases (Signs, Fencing, Booms, etc)		1.5	0.6	0.6	0.6
Dam Safety Surveillance Inspection Increases (per Independent Panel)		1.0	1.0	1.0	1.0
Central Hydro PG (Strengthen Organizatio/Due Diligence & Improve Maintenance)	0.2	1.4	1.6	1.8	1.9
Re-investment in the Small Hydro Fleet (Project Changes)					
Niagara Joint Works Changes (NYPA cost increases)		1.2	0.5		
Geographic Information System (GIS) Implementation		1.8	0.2	0.2	0.2
Shoreline Remediation/Erosion Protection Projects (First Nations)	-2.9	0.7			
Miscellaneous Changes	-5.1	0.6	3.7	1.4	-0.5
OM&A Submission (before labour rate & payroll burden reduction)					
SAVH Transferred to Capital		-1.7	-1.7	-1.7	-1.7
Labour Rate & Burden Reduction		-9.1	-9.7	-11.6	-11.4
OM&A Submission					
Change in OM&A From Last Year's Plan					

Capital - Plan Over Plan

Major Changes

- Project costs on both the operations side of business and new developments have been increased to reflect actual contract bids, and latest material/ equipment/contracting cost information.
- Replacement of old wood stave and steel penstocks at small hydro plants (eg, South Falls, Matabitchuan) have been advanced. DeCew Falls 1 steel penstock to be replaced in 2009 to 2011.
- Niagara Tunnel in-service date and cost has been changed to December 2013 and $1.6 billion, respectively.
  Cash flows and energy production assumptions for the tunnel are aligned with this in-service date.
- Pre-concept phase costs for new development projects and initiatives such as pumped storage added.
- Lower Mattagami total cost increased to [redacted] and schedule per latest contractor estimates.

Capital - Plan Over Plan	2009 Proj'n	2010	2011	2012	2013
Last Year's Plan ($M)	[redacted]				
Operations Changes					
SAB1 G10,3,5,4 Upgrade changes (Runner Upgrade/Rewind)	-2	-10	-10	-5	-3
Civil Project Changes	2	6	9	0	-3
Major Mechanical, Electrical & P&C Equipment Replacements (Reprioritization & Scope Changes)	-5	3	4	2	5
Equipment Cost Increases	2	4	0	0	0
Operations Projects deferred to align with Hydro Development projects	[redacted]				
Penstock Replacement Changes and Cost Increases	1	-2	15	4	0
Small Hydro Re-Investment	[redacted]				
New Development Changes					
Niagara Tunnel Project	49	7	145	197	214
Lower Mattagami	[redacted]				
Upper Mattagami and Hound Chute					
Mattagami Lake Dam					
Healey Falls					
Little Jackfish					
Hydro Development Project and Other Changes (Timing)					
Capital Submission					
Change in Capital From Last Year's Plan					

Hydroelectric Development Plan

	Capacity	Pre-2009	2009	2010	2011	2012	2013	2014	Bal	Total
	MW		$M	$M	$M	$M	$M	$M	$M	$M
Projects In-Progress										
Niagara Tunnel Project (from NTP Info Sheet)		434.5	222.7	241.8	288.0	199.0	214.0	0.0	0.0	1,600
Upper Mattagami & Hound Chute										
Healey Falls										
Subtotal (Projects In-Progress)										
Projects In Definition Phase										
Lower Mattagami										
Mattagami Lake Dam										
Little Jackfish										
Subtotal (Defintion Phase)										
Projects in Concept/Pre-Concept (Corporate Provision)										
Ranney Falls										
Newpost Creek										
Long Lake Dam										
South Falls										
OPG Control Dams										
Lake Gibson										
Moose River Basin (Greenfield)										
Albany River (Hat & Chard)										
Northern Rivers										
Calabogie										
Maynard Falls										
Concept/Pre-Concept - Corp. Provision										
Total (Projects In-Progress, In Definition Phase & Pre-Def'n Phase)										

General

- Costs for projects presently in execution and definition phases are included in this business plan.
- Timing of execution phase for projects presently in definition phase will be dependent on government directives, HESA's (from OPA), agreements with First Nations, EA approvals, etc (timing of phases for each project shown on next page).

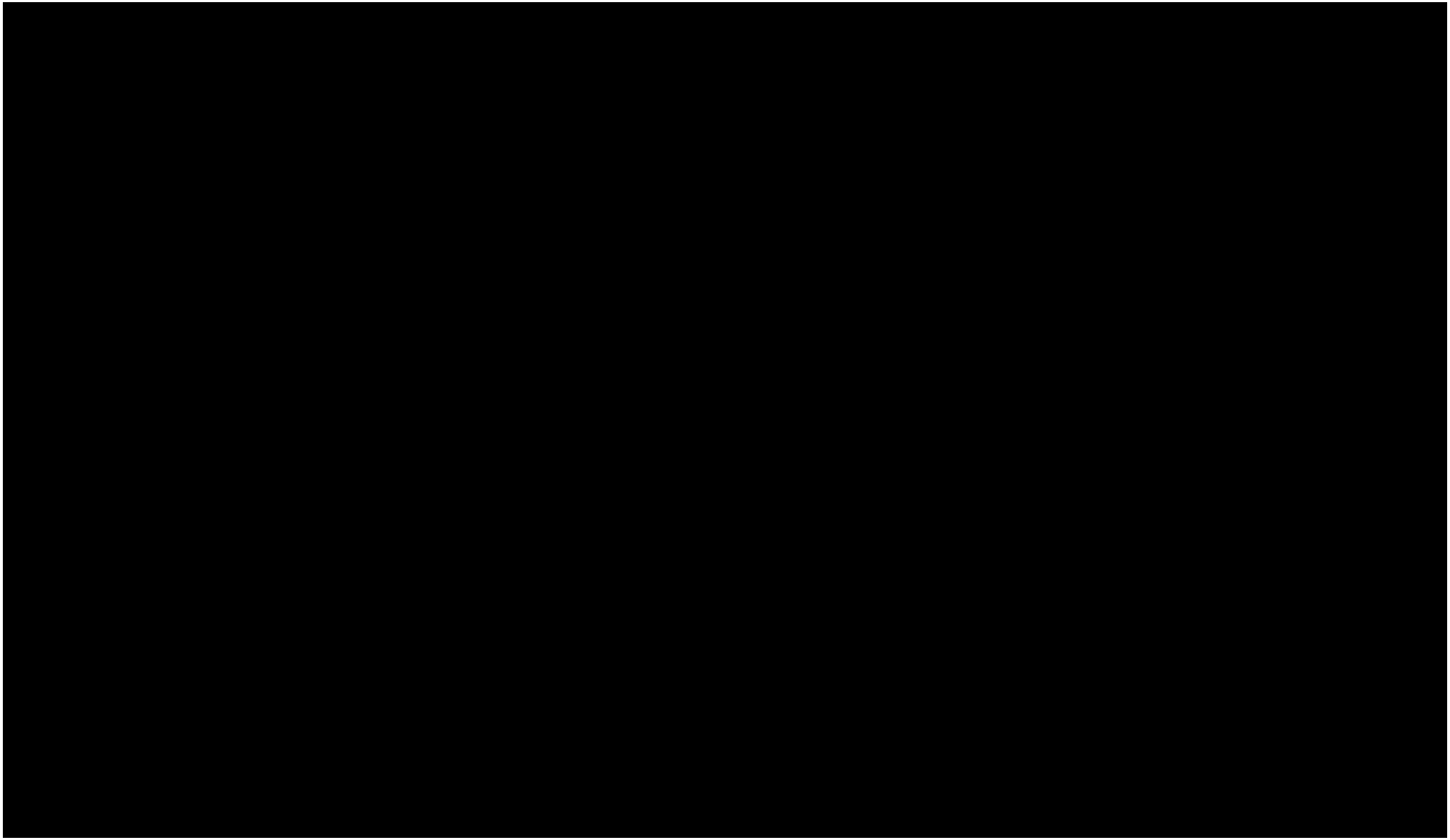
Pumped Storage

- Extensive review of historical information and international pumped storage installations completed and OPG sites have been identified as being the most desirable for addition of pumped storage. As well, preliminary review of expansion of the existing Sir Adam Beck PGS reservoir has been conducted.
-

Project In-Service Dates

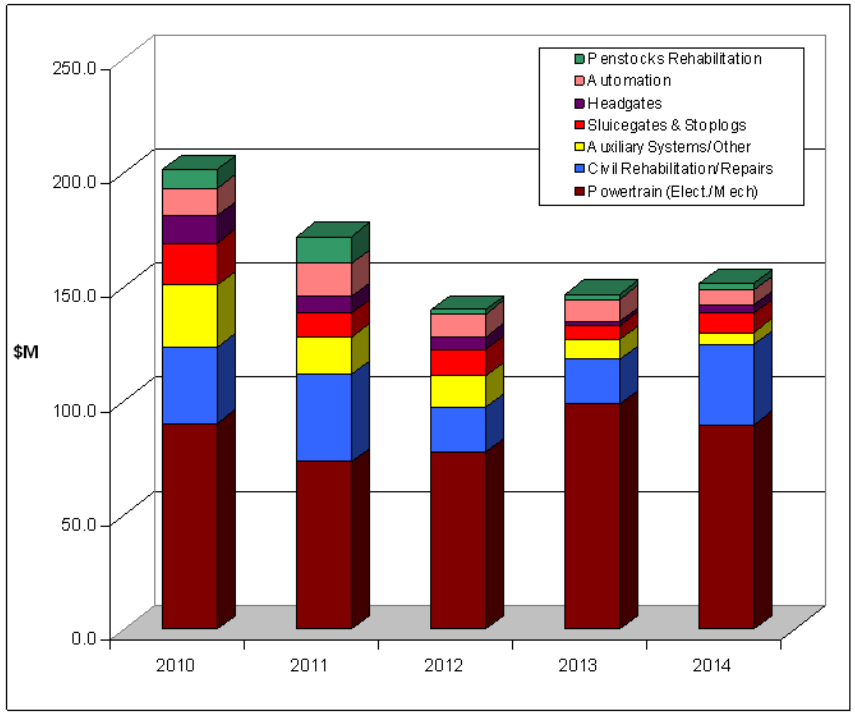
- Healey Falls:
- Upper Mattagami/Hound Chute:
- Niagara Tunnel: December 2013
- Mattagami Lake
- Lower Mattagami:

Hydroelectric Development Plan (Project Phases/Timelines)

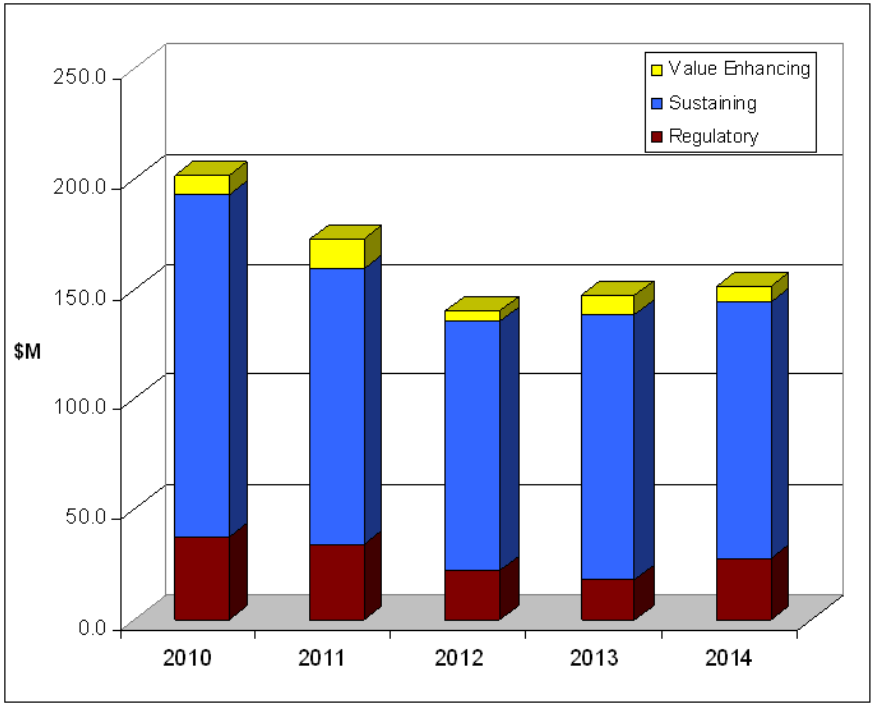


Project Expenditures To Maintain and Improve Existing Assets

By Discipline/Component



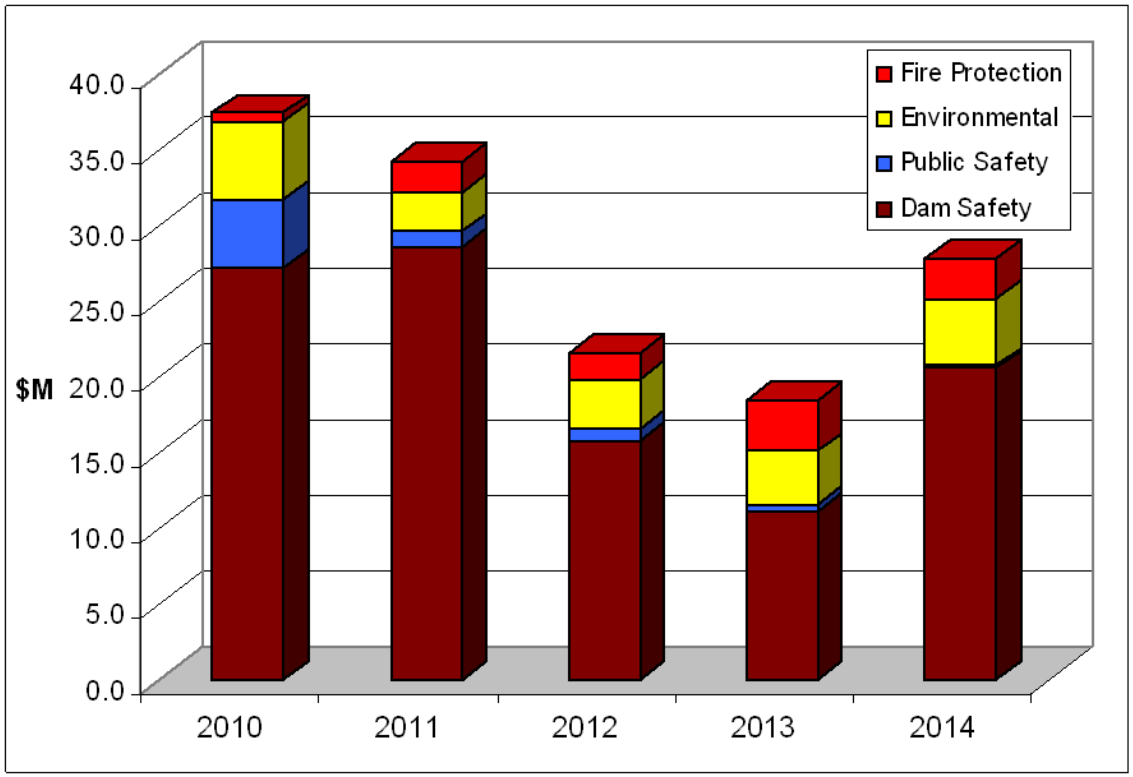
By Regulatory/Sustaining/Value Enhancing



Continued re-investment, averaging [redacted] per year in Capital and OM&A project expenditures, will be required to sustain and improve the existing assets per our mandate. Major investments will include:

- replacement of ageing "power train components" such as turbines, generators, transformers
- replacement of control equipment (automation) to improve efficiency and accommodate market dispatch requirements
- repairs, rehabilitation or replacement of ageing civil structures including powerhouses, penstocks, dams, sluiceways and bridges
- replacement and refurbishment of headgates and sluicegates
- runner upgrades/replacements
- investment in small hydro facilities

Project Expenditures - Safety and Environmental Programs

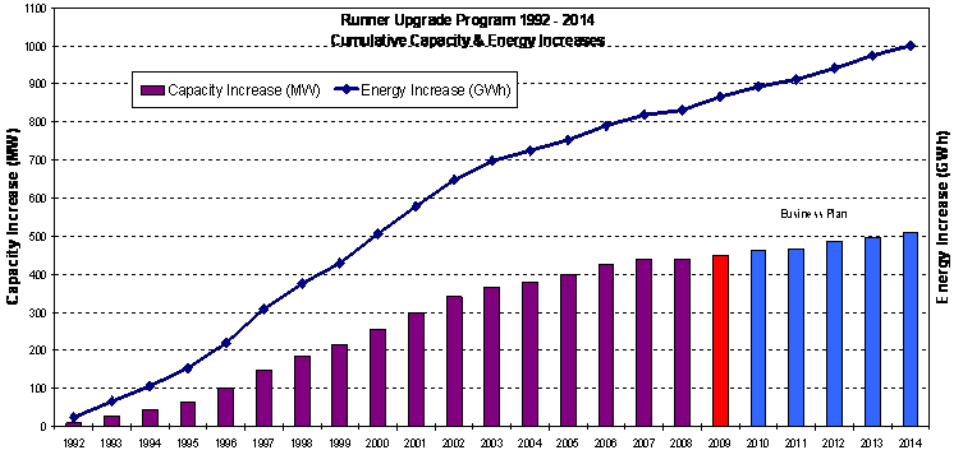


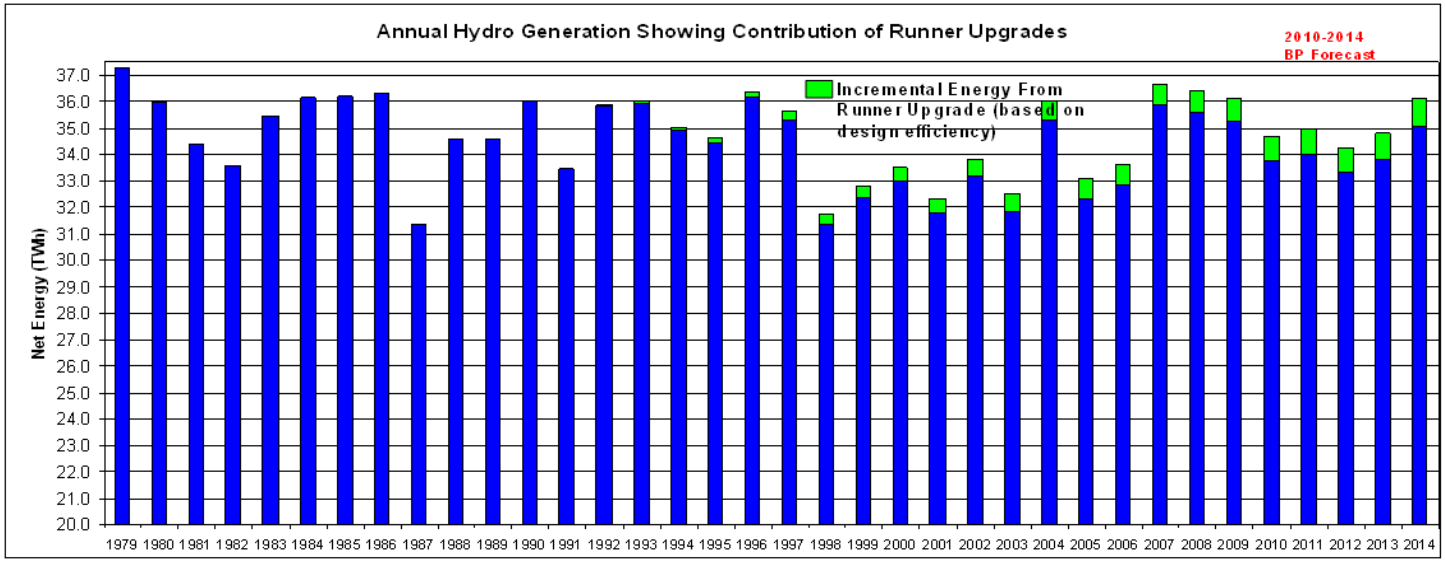
Project expenditures for safety and environmental programs during planning period:

- Public Safety (safety booms, fencing, signs, video cameras, special structures, etc) (5% of total safety and environmental project costs).
- Dam Safety (sluicegate & headgate refurbishments/additions, dam upgrades/ restoration)(74%).
- Environment (oil containment, turbine pit/sump improvements, underground piping remediation) (14%).
- Fire Protection (life safety projects). Program to be completed during planning period. (7%).

Runner Upgrade Program

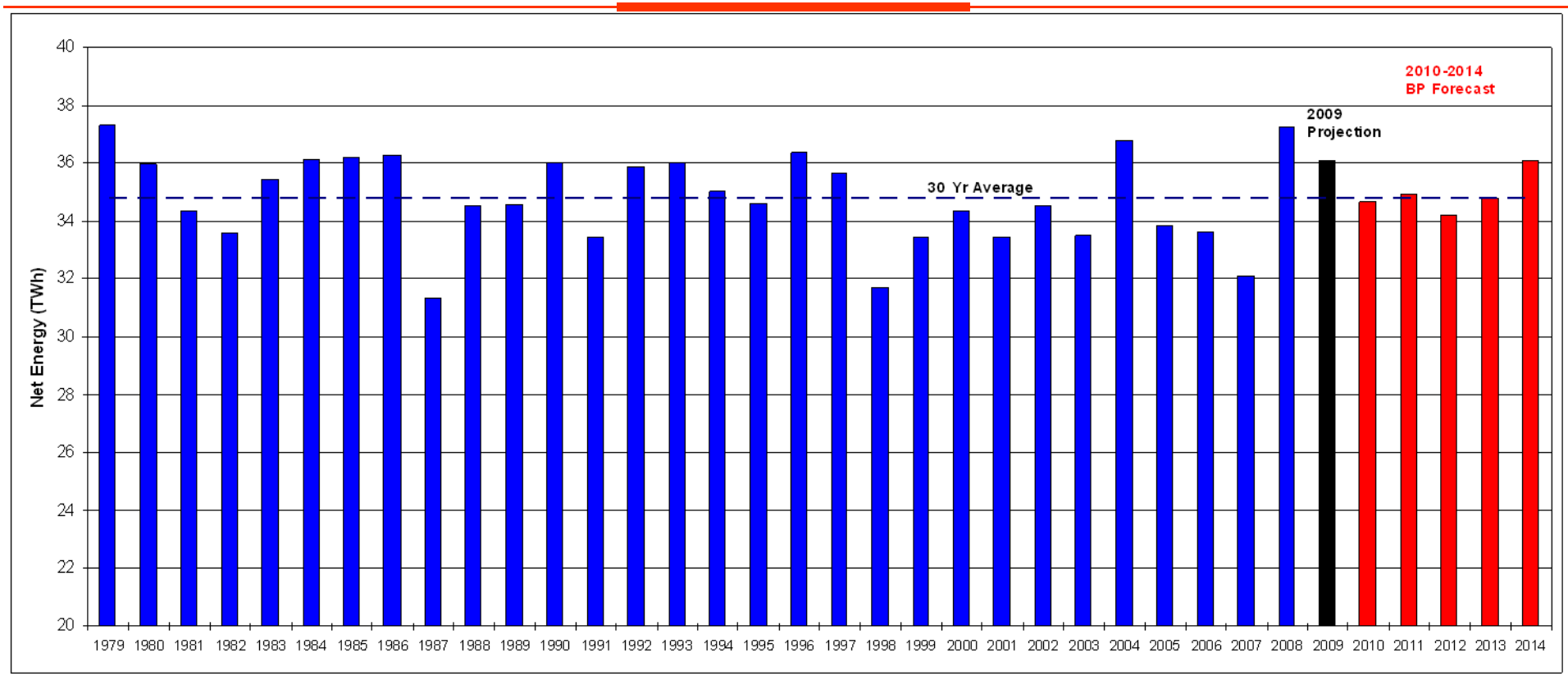
	Completed 1992 to 2008	2009	2010	2011	2012	2013	2014	Total (2010 to 2014)
CAPACITY (MW)	439	11	13	4	19	18	12	66
ENERGY (GWh)	831	35	26	25	29	38	27	144
TOTAL CAPITAL COST (M$)	167	15	9	14	8	12	7	51





- In 2009, Hydro is adding 11.2 MW of capacity & 35.3 GWh of energy. During the planning period runner upgrades will add 65.9 MW and 144 GWh.
- Execution of remaining program will continue as quickly as practical. A business case will be developed for each project before proceeding (LUEC's presently estimated to be between 3 and 10 cents/kWh depending on project).
- The speed of execution may be impacted by IESO constraints, consideration of outage spill losses, coordination with other major work, resource availability (internal resources and external contractors) & coordination with development projects (at existing sites - LMD).

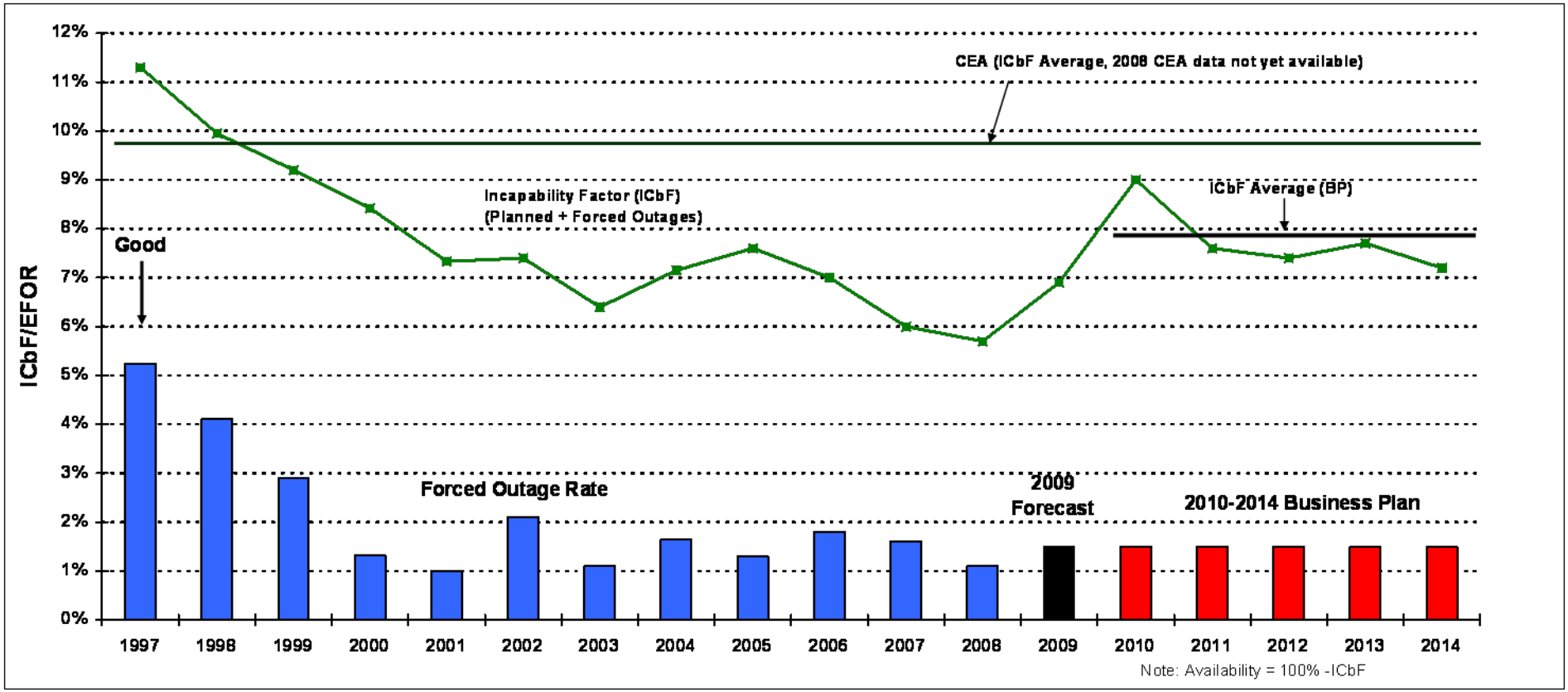
Energy Production Plan



- Base 2010 to 2014 energy forecast assumes median water levels and Surplus Baseload Generation (SBG) spill losses included per Energy Markets forecast (see graph)
- Major energy increases during business plan period include:
  - 2013: Niagara Tunnel Energy (1.6 TWh in 2014)
  - 2010:Upper Mattagami [redacted]
  - 2013/2014: Lower Mattagami [redacted]

[redacted]

Reliability



- Availability will average 92.2% (ICbF=7.8%) during the business planning period. This is significantly better than the CEA average.
- In 2010 to 2014, availability will be lower than the 2009 projection due to additional/long outages required for major rehabilitations and upgrades at several stations (eg, Sir Adam Beck 1 Units 9,10, 3, 4 & 5, Mountain Chute Unit 2, Des Joachims, Otter Rapids, Lower Notch, Little Long, Harmon, Abitibi Canyon (full station outage), Otto Holden, Pine Portage, Whitedog Falls, Alexander Falls.
- EFOR is assumed to average 1.5% during the business planning period. This is also significantly better than the CEA average. A stretch target of 1.4% is proposed for EFOR.
- EFOR & Availability may be negatively impacted by additional dispatches and stops/starts associated with SBG situation.

Aboriginal Program

	2009 Actual	2010	2011	2012	2013	2014
Community Relations and Outreach (M$) Community Support	1.0	1.1	1.1	0.6	0.6	0.6
Capacity Building Support (M$) Educational Partnership Scholarships/Bursaries Mentoring Project Participation	1.6	4.3	4.1	3.6	3.6	3.6
Employment Opportunities (M$) New hires - regular/PT/Students	0.8	1.3	0.6	0.5	0.5	0.5
Contracting Opportunities (M$) Contracts	0.3	0.8	0.1	0.0	0.0	0.0
Other Initiatives (M$)	0.0	0.7	0.0	0.0	0.0	0.0
Total	3.8	8.3	5.9	4.7	4.7	4.7

- Program includes both operations and hydroelectric development initiatives.
- Program covers 30 First Nations and Metis.
- Hydroelectric Development costs include support to First Nations for:
  - Commercial agreements
  - Technical studies/assistance
  - EA consultants
  - Employment training

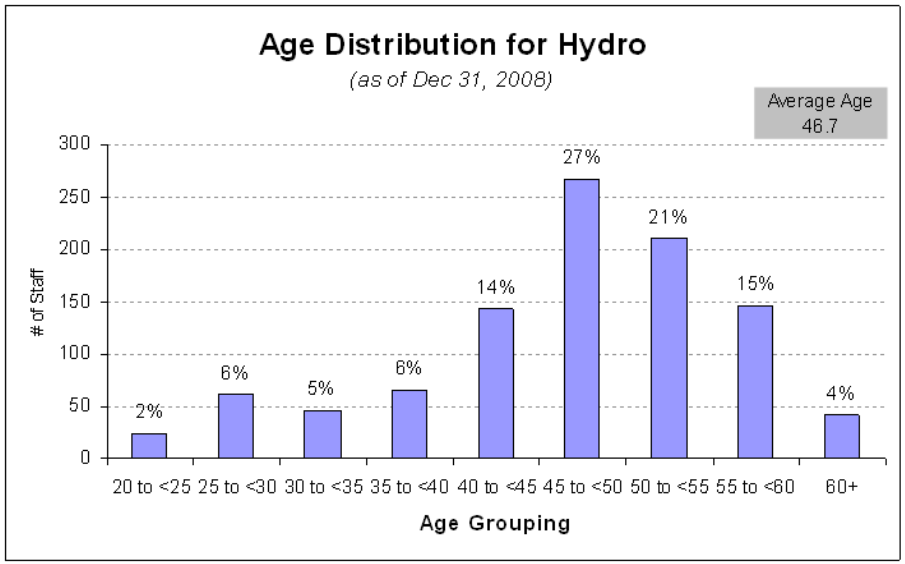
Notes

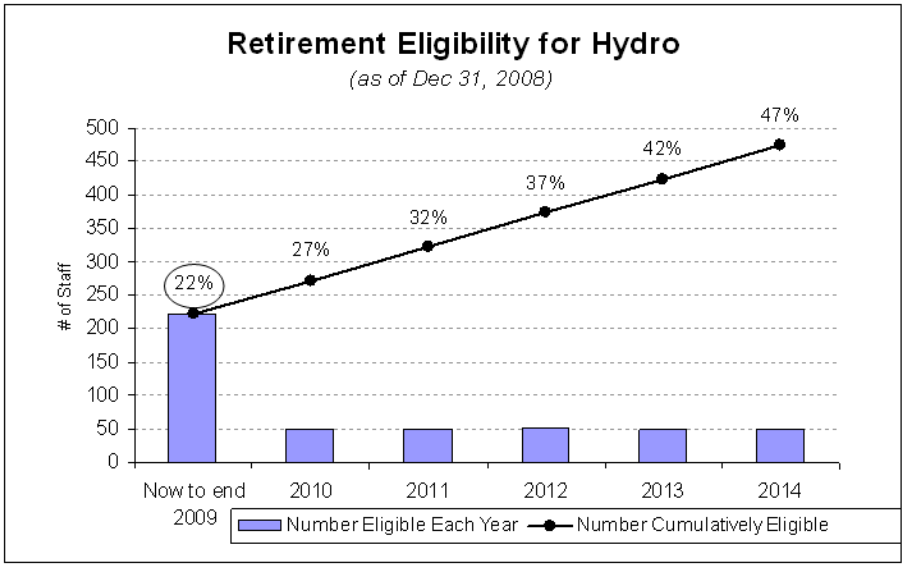
1. Above costs are already included in Business Plan, either in base OM&A for the Plant Groups or Hydroelectric Development project costs.
2. Above table does not include past grievance settlement costs and remediation work (eg, Long Lac #58 shoreline remediation and Whitesand erosion repairs).
3. Above table does not include Plant Group and Aboriginal Affairs Division staffing costs to manage and carry out the aboriginal program.

Demographics

- During 2008 and 2009, significant progress has been made to reduce this risk through external hiring strategy (apprentices, Hydroelectric Operating Trades Trainee's, and Engineering/Professional Trainees).

- Demographics have marginally improved since 2008, but 22% of staff are still eligible to retire by end of 2009 and 47% by end of 2014. Thus, it is important to continue hiring and training strategy which was initiated in 2008 (see next page).



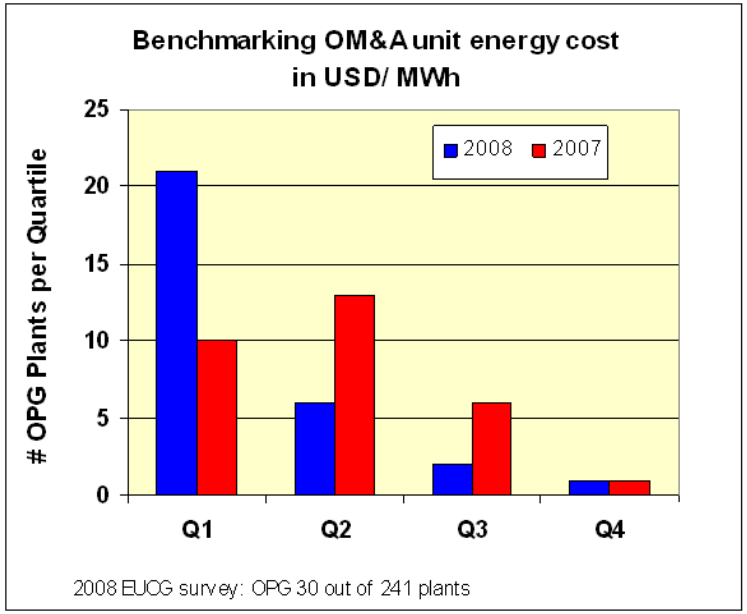


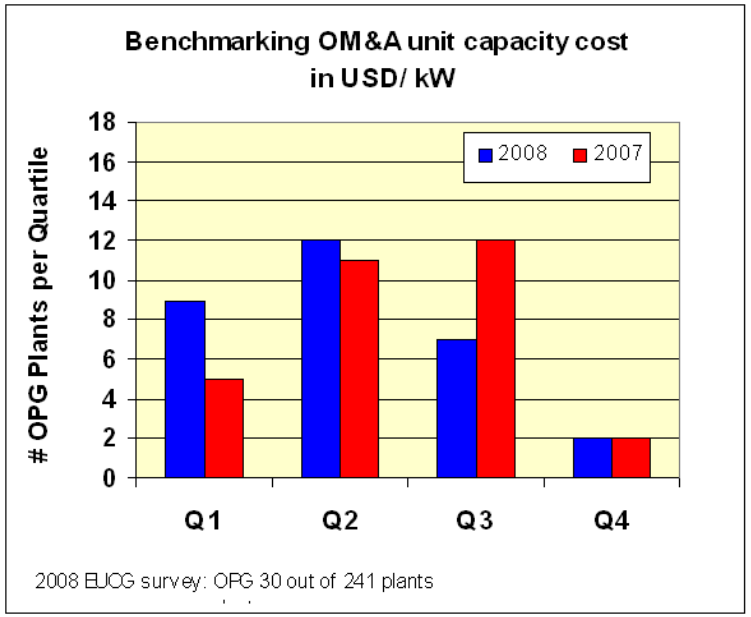
Staffing Strategy/Plan

- Aggressive hiring strategy to attract skilled ("journey person") trades external to the company.
- Apprenticeship Program – hiring and training apprentices to replace retiring skilled trades.
- "Strategic Complement" – Strategy of "over hiring" to account for unexpected attrition, high turnover, and long lead times required to hire staff.
- Succession Management – succession planning for leadership roles down to FLM level is formally underway.
- Knowledge Transfer – overlap new hires with anticipated retirements to ensure knowledge transfer.
- Re-establish Graduate Engineering Trainee Programs.
- Leadership/Supervisory Development Program.
- Reduce temporary staff, contract staff and consultants as regular staff complement increases.

Regular Staff - Plan Over Plan	2009 Proj'n	2010	2011	2012	2013
Last Year's Plan (Staff)	[redacted]				
Changes					
Maintenance Staff Changes including Apprentices (Journeyperson Mechanical/Electrical Maintainers)					
Operations & Maintenance Support (engineering, project management, environment, public safety, regulatory support, public affairs, etc)					
Hydroelectric Development Staff Increases for Concept Phase Work and Project/Construction Management					
Plant Group Operations Support for New Development Projects (Upper Mattagami, Lower Mattagami, Little Jackfish)					
Central Hydro Plant Group (Organizational Reinforcement)					
Hydro Staff BP Submission					
Change in Total Staff From Last Year's Plan					

Benchmarking of OM&A Costs – EUCG (2008)



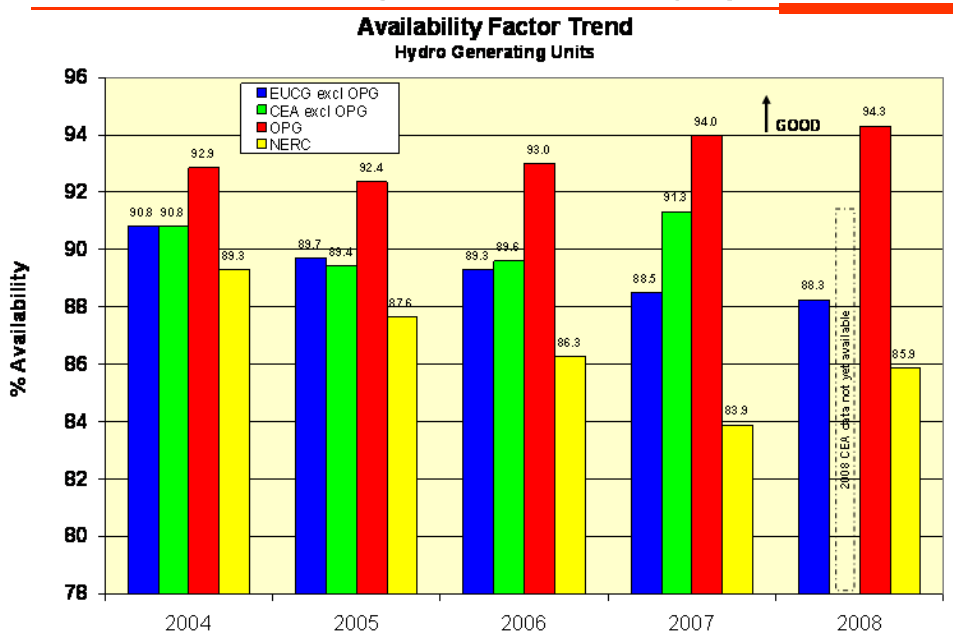


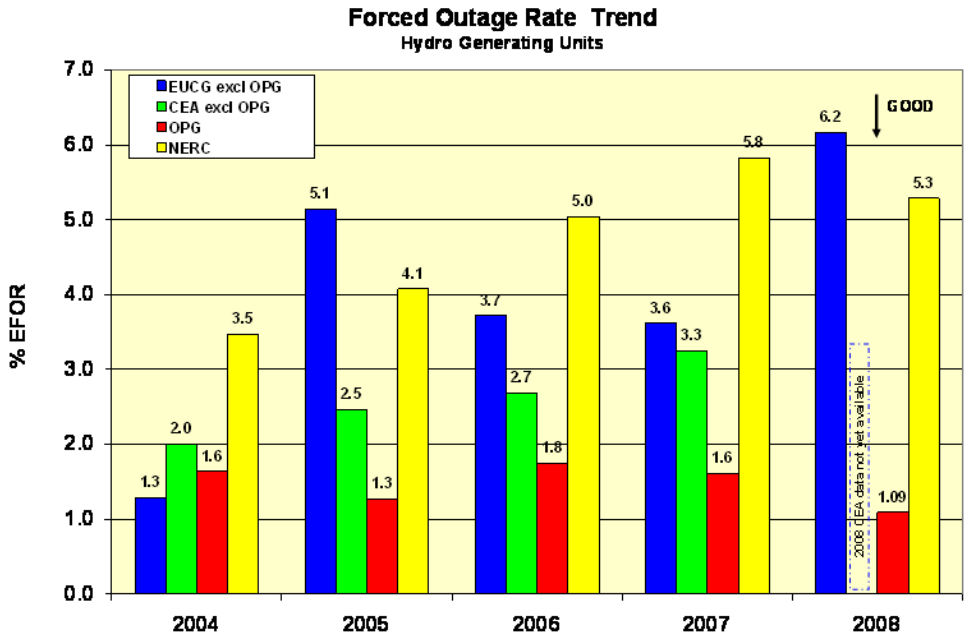
	2008 OPG Plant Distribution				total
	Q1	Q2	Q3	Q4	
USD/ MWh	1.0 - 8.7	8.7 - 17.6	17.6 - 44.0	44.0 - 1,132	
# plants	21	6	2	1	30
TWh	33.1	3.8	0.3	0.1	37.3
% TWh	89%	10%	0.9%	0.4%	100%

	2008 OPG Plant Distribution				total
	Q1	Q2	Q3	Q4	
USD/ kW	7.2 - 24.0	24.0 - 44.3	44.3 - 96.4	96.4 - 1,860	
# plants	9	12	7	2	30
MW	4,206	2,038	650	42	6,935
% MW	61%	29%	9%	0.6%	100%

- OM&A costs continue to be competitive with other EUCG participating utilities (99% of Hydro generation is in top two quartiles.
- Most of our large stations (eg, Saunders, Sir Adam Beck 2 and Des Joachims) are in the top quartile.

Benchmarking of Reliability (2004 – 2008)





- Hydro Availability and EFOR continues to benchmark better than EUCG and NERC participants.

- <u>Availability (EUCG Benchmarking)</u>
  - 10 Hydro plants are in the top quartile.
  - 19 plants are better than the median. This accounts for 71% of Hydro capacity.

- <u>Forced Outage Rate (EUCG Benchmarking)</u>
  - Hydro has 18 plants that are better than the median. This accounts for 52% of Hydro capacity.

Notes:

1) 30 OPG Hydro stations are included in the benchmarking. Benchmarking studies do not include small stations/units

2) CEA benchmarking data for 2008 is not yet available.

Key Business Risks

- Niagara Tunnel Project – Delays in schedule, increase in project cost and geological risk.
- Hydroelectric development project risks associated with project management capability, availability of qualified contractors and skilled labour, cost escalation, EA approvals, First Nations support/partnerships, obtaining PPA's or HESA's from OPA.
- Cost escalation risk - Hydro Operations:
  - Construction and rehabilitation activity in power sector and other infrastructure continues to be robust, leading to increased demand for equipment, materials, labour, and consulting and contracting services.
  - This could significantly increase costs for repair, rehabilitation and replacement projects.
- Demographic risk, especially in the engineering and skilled trades areas.
- Dam Safety (New Regulation risk) and Public Safety risks. Potential upgrade costs are not included in plan.
- Aboriginal Past Grievances - Cost of future settlements and additional claims may be higher than current provision.
- Ageing Plants: Asset integrity, reliability and safety at risk without continued re-investment.
- Structural and operational risks associated with:
  - Alkali Aggregate Reaction (AAR) induced concrete growth at Otto Holden, Saunders, Manitou Falls, Pine Portage, Chats Falls and Frederickhouse Dam.
  - Ageing wood stave and steel penstocks at Nipissing GS and Matabitchuan GS.
- Environmental risk associated with Ontario Endangered Species Act and Federal Species at Risk Act (compliance may require mitigation costs and impacts on production/revenue)
- Risks/impacts on Hydro production and reliability (generating equipment and sluice gates) of increasing Surplus Baseload Generation (SBG) situation in Ontario

The above risks are mitigated through programs, prudent asset management strategies and managed systems incorporated in this Business Plan. The risk profile of Hydro has not significantly increased due to new development projects. Project risks are mitigated by implementation of rigorous planning and project management systems/controls and revenue certainty from financial contracts (HESA's).

Appendix A
Additional Information

Station Statistics

HYDROELECTRIC PLANT LISTING BY PLANT GROUP

Niagara Plant Group	No. of Units	Capacity (MW)	30 Yr Avg Energy (GWH)	Age In 2009 (Years)	Capacity Factor
Decew Falls ND1	4	23	107	111	54
Decew Falls NF23	2	144	1,037	65	82
Sir Adam Beck I	8	417	2,162	87	59
Sir Adam Beck II	16	1,499	9,568	55	73
Sir Adam Beck PGS	6	174	-121	52	7
TOTAL	36	2,257	12,753	74	65
CNP Payback & Water Transfers			-500		
TOTAL (after CNP/WT)			12,253		62

NUMBER OF DAMS & SPECIAL STRUCTURE **25**

Note: Units 1 & 2 at SAB 1 are deregistered in April 2009 (were 25 Hz units)

Northeast Plant Group					
Abitibi Canyon	5	349	1,340	76	44
Harmon	2	141	632	44	51
Hound Chute	0	0	0	0	Redev.
Indian Chute	2	3	16	85	63
Kipling	2	157	633	43	46
Little Long	2	133	555	46	48
Lower Notch	2	274	400	38	17
Lower Sturgeon	0	0	0	0	Redev.
Matabitchuan	4	10	52	99	62
Otter Rapids	4	182	707	48	44
Sandy Falls	0	0	0	0	Redev.
Smoky Falls*	4	52	377	85	82
Wawaitin	4	11	51	97	54
TOTAL	31	1,312.1	4,763	51	41

NUMBER OF DAMS IN PLANT GROUP **41**

Ottawa-St. Lawrence Plant Group	No. of Units	Capacity (MW)	30 Yr Avg Energy (GWH)	Age In 2009 (Years)	Capacity Factor
Arnprior	2	82	147	33	21
Barrett Chute	4	176	302	67	20
Calabogie	2	5	21	92	52
Chats Falls	4	96	531	78	63
Chenaux	8	144	734	59	58
Des Joachims	8	429	2,264	59	60
Mountain Chute	2	170	298	42	20
Otto Holden	8	243	1,153	57	54
R.H. Saunders	16	1,045	6,844	51	75
Stewartville	5	182	308	61	19
TOTAL	59	2,570.9	12,603	60	56

NUMBER OF DAMS IN PLANT GROUP **45**

Northwest Plant Group					
Aguasabon	2	51	291	61	65
Alexander	5	68	428	79	72
Cameron Falls	7	90	530	88	67
Caribou Falls	3	91	515	51	64
Ear Falls	4	17	115	79	77
Kakabeka Falls	4	25	143	103	66
Manitou Falls	5	73	392	53	61
Pine Portage	4	142	791	59	64
Silver Falls	1	48	214	50	51
Whitedog Falls	3	68	392	51	66
Lac Seul	1	12	52	1	49
TOTAL	39	684	3861	61	64

NUMBER OF DAMS IN PLANT GROUP **54**

Central Hydro Plant Group	No. of Units	Capacity (MW)	30 Yr Avg Energy (GWH)	Age In 2009 (Years)	Capacity Factor
Auburn	3	2	10	98	63
Big Chute	1	10.0	51	16	58
Big Eddy	2	8.0	37	68	53
Bingham Chute	2	1.0	4	86	48
Coniston	3	4.6	19	104	47
Crystal Falls	4	8.4	43	88	58
Elliot Chute	1	1.6	5	80	37
Eugenia Falls	3	6.1	23	94	43
Frankford	4	2.6	14	96	61
Hagues Reach	3	3.6	20	84	64
Hanna Chute	1	1.4	8	83	65
Healey Falls	3	11.8	72	96	70
High Falls	3	2.7	15	89	63
Lakefield	1	1.8	7	81	47
McVittie	2	2.8	11	97	47
Merrickville	2	1.7	6	94	39
Meyersberg	3	5.2	34	85	75
Nipissing	2	1.8	9	100	58
Ragged Rapids	2	8.3	40	71	55
Ranney Falls	3	10.4	52	87	57
Seymour	5	5.7	32	100	65
Sidney	4	4.4	25	98	66
Sills Island	2	1.8	9	109	54
South Falls	3	5.0	26	102	60
Stinson	2	5.4	23	84	49
Trethewey Falls	1	1.8	9	80	60
TOTAL	65	119.8	607	87	58

NUMBER OF DAMS IN DIVISION **66**

Total Capacity (MW)	**6,943**		
Average Energy (TWh)	**34.7**	**Avg. Age of Plants(yr)**	**70**
Total Number of Plants	**65**	**Number of Units**	**230**
Total Number of Dams	**231**		

"Portfolio Approach" to Asset Management

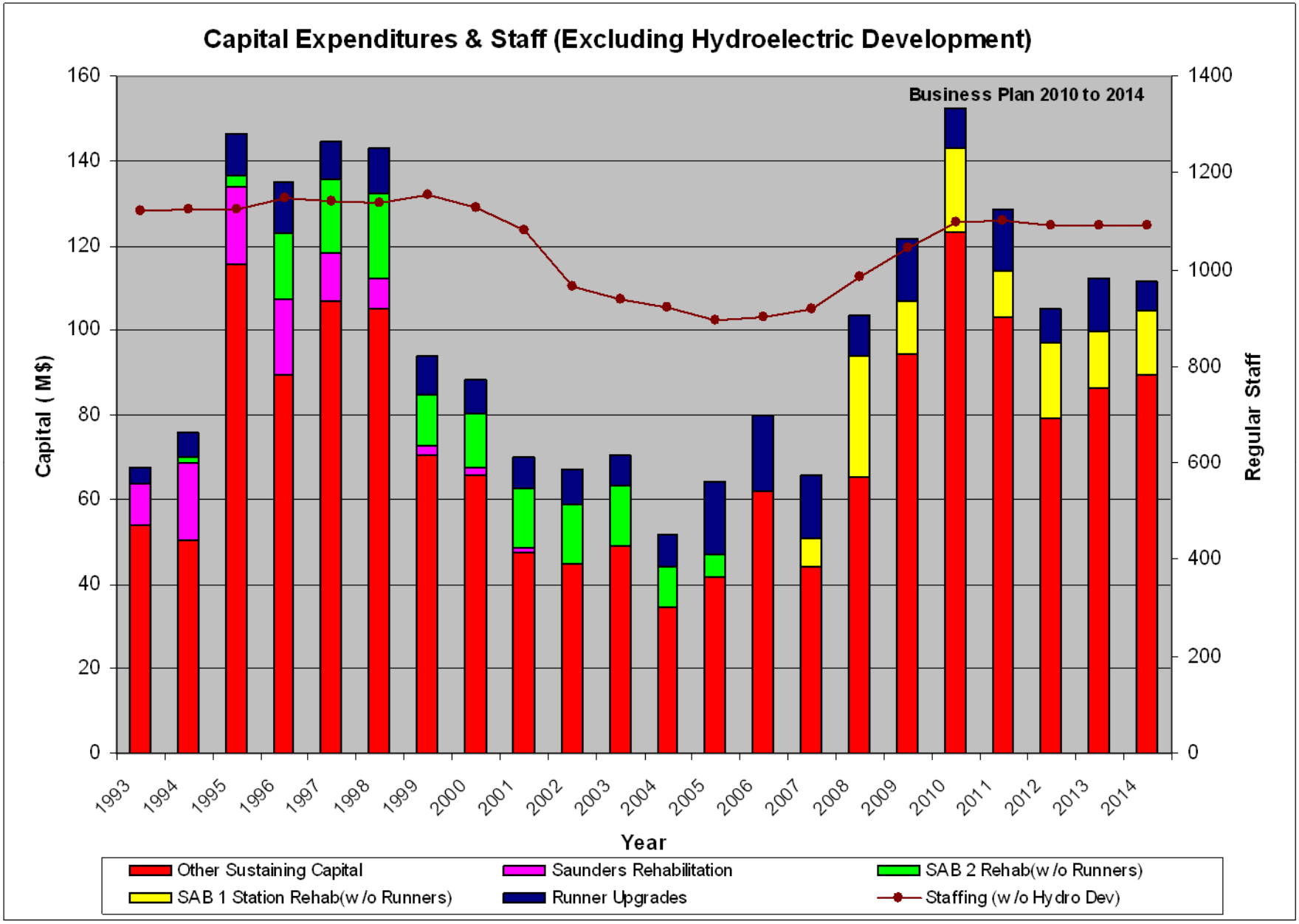
- Large portfolio of Hydro stations/units of varying vintage, technology and design makes it a challenge to prioritize maintenance and investments
- Portfolio of hydroelectric assets classified into 5 asset classes:
  1) Flagship
  2) Workhorse
  3) Middle of the Pack
  4) Small Plants
  5) Marginal Plants
- Stations in each asset class have similar characteristics/attributes & priorities.
- Provides asset management framework for:
  1) Determination of business priorities
  2) Assignment of risk tolerance
  3) Allocation of investment resources
  4) Determination of maintenance priorities (LEM)
- Economic value vs risk was used to classify stations into each asset class (risks include operational/environmental, condition, future investment, etc)

Prioritization Matrix - Projects and Maintenance Activities

		Business Objectives (Work Categories)			
Asset Class	Stations	Regulatory and Obligations (See Note 2)	Maintain Condition (MC)		Value Enhancing or Improvement
			Asset Protection	Production	Non-production	
Flagship	SAB II, R.H. Saunders, Des Joachims, SAB 1	1	2	3	8	NPV, IRR & PAYBACK
Workhorse	Abitibi Canyon, DeCew NF23, Otto Holden, Otter Rapids Pine Portage, Lower Notch, Kipling, Chenaux Harmon, Little Long, Mountain Chute, SAB PGS Caribou Falls, Stewartville, Whitedog, Silver Falls Aguasabon	1	2	4	9	NPV, IRR & PAYBACK PERIOD
Middle of the Pack	Barrett Chute, Chats Falls, Alexander, Manitou Falls Cameron Falls, Smoky Falls, Arnprior, Lac Seul Kakabeka Falls, DeCew ND1, Ear Falls	1	2	5	10	NPV, IRR & PAYBACK PERIOD
Small Plants	Healey Falls, Big Chute, Ragged Rapids, Matabitchuan Ranney Falls, Big Eddy, Sidney, Meyersberg Seymour, South Falls, Crystal Falls, Indian Chute Eugenia, Frankford, Trethewey Falls, Hagues Reach High Falls, Hanna Chute, Sills Island, Auburn Stinson, McVittie, Coniston, Merrickville Lakefield	1	6	7	13	NPV, IRR & PAYBACK PERIOD
Marginal	Hound Chute, Calabogie, Wawaitin, Lower Sturgeon Sandy Falls, Bingham Chute, Elliott Chute, Nipissing	1	11	12	14	NPV, IRR & PAYBACK PERIOD

1. Projects are assigned a priority in the Work Program Catalogue/Project Listing by applying this matrix in order to establish the relative importance of projects.
2. Regulatory/Obligations category includes expenditures required to satisfy contractual obligations, dam safety requirements, health and safety regulations, environmental regulations, and corporate policy. It is expected that all projects in this category will be funded or corrective action be taken.
3. Value enhancing or Performance Improvement projects, are to be assessed on an individual basis and must meet corporate financial guidelines.
4. Refer to the " Business Objectives/Work Categories - Definitions" for a description of what is included in each category.
5. Plants highlighted in red are being redeveloped.

Capital Investments (Past, Present & Future)



Hydro Revenue, Cost, Staffing and Performance Summary

HYDRO TOTAL	2009 Forecast	2010	2011	2012	2013	2014
Energy TW.h	**36**	**34.1**	**34.4**	**33.8**	**34.4**	**36.0**
Total Revenue (M$)						
OM&A (M$)						
- Base						
- Projects (Totals from project listings)						
Capital & MFA (M$)						
- MFA						
- Projects (Totals from project listings)						
Total Regular Staff at YE	**1077**	**1138**	**1144**	**1130**	**1131**	**1132**
- PWU	697	729	733	720	723	722
- Society	285	306	307	306	304	306
- Management Group	95	103	104	104	104	104
Temporary Staff FTEs	**12**	**16**	**16**	**16**	**16**	**16**
Fuel/GRC & Other Water Rentals (M$)	**365**	**353**	**358**	**357**	**353**	**347**
Total Gross Labour ($M)	**145**	**154**	**161**	**169**	**173**	**179**
- Total Gross Regular	143	152	159	167	171	177
- Total Gross Temporary & Other	2	2	2	2	2	2
- Overtime	7	7	8	8	8	9
- Overtime (% of Gross labour)	5	4.9	4.9	4.9	4.9	5.0
Availability Factor %	**93.1**	**91.0**	**92.4**	**92.6**	**92.3**	**92.8**
Equivalent Forced Outage Rate (EFOR) %	1.5	1.5	1.5	1.5	1.5	1.5
Scheduled Outage Factor (SOF) %	5.7	7.8	6.4	6.2	6.5	6.0
Incapability Factor %	6.9	9.0	7.6	7.4	7.7	7.2
OM&A UEC ($/MW.h)						
FUEC ($/MW.h) (GRC+Water Rentals)						
PUEC ($/MW.h) (Operations)						
Contribution Margin (M$)						
Capacity (MW)	**6943**	**6995**	**7000**	**6966**	**7228**	**7484**

OM&A And Capital - Year Over Year Changes (2009 to 2010)

Capacity Changes During Planning Period

Hydro Capacity Summary	2009	2010	2011	2012	2013	2014	Change (2010 to 2014)
TOTAL CAPACITY AT BEGINNING OF YEAR (MW)	6,961	6,943	6,996	7,000	6,966	7,228	
Runner Upgrade Program	11.2	12.6	4.4	18.8	18.0	12.1	65.9
SAB 1 G7 Conversion (25 Cycle to 60 Cycle-does not incl. runner upgrade portion)	54.6						0.0
SAB 1 (Decommissioning of 25 cycle system - G1 & G2)	-92.0						0.0
Lake Gibson	[redacted]						
Upper Mattagami Redevelopment							
Sandy Falls							
Lower Sturgeon							
Wawaitin							
Hound Chute							
Lower Mattagami Redevelopment							
Little Long							
Harmon							
Kipling							
Smoky Falls							
Mattagami Lake Dam							
Newpost Creek							
Healey Falls							
Ranney Falls							
Lac Seul GS							
Long Lake							
Little Jackfish							
Lake Gibson							
South Falls							
TOTAL CAPACITY AT END OF YEAR (MW)							

Energy Production Plan (Impacts of Surplus Baseload Generation)

Business Plan 2010-2014 Energy Production Forecast with SBG					
PLANT GROUP	2010 TWh	2011 TWh	2012 TWh	2013 TWh	2014 TWh
Niagara Plant Group Total	12.99	13.23	13.21	13.27	14.14
Group SBG	0.18	0.46	0.80	0.34	0.75
Niagara PG Adjusted SBG Group Total	12.81	12.77	12.41	12.93	13.39
OSPG Group Total	12.56	12.61	12.61	12.53	12.56
Group SBG	0.00	0.02	0.05	0.02	0.03
OSPG Adjusted SBG Group Total	12.56	12.60	12.55	12.51	12.54
Northeast Plant Group Total					
Group SBG					
NEPG Adjusted SBG Group Total					
Northwest Plant Group Total					
Group SBG					
NWPG Adjusted SBG Group Total					
Central Hydro Plant Group Total					
Group SBG					
CHPG Adjusted SBG Group Total					
HYDROELECTRIC TOTAL					
Total SBG					
ADJUSTED SBG HYDROELECTRIC TOTAL					

[redacted]

Appendix B
Regulated Asset Information

Hydro Regulated Asset Performance & Cost Summary

Regulated Hydro (Includes Hydro Central Office Allocations)	2009 Forecast	2010	2011	2012	2013	2014
Energy TW.h	**19.5**	**19.3**	**19.4**	**19.0**	**19.6**	**20.3**
Total Revenue (M$)	**733**	**713**	**741**	**730**	**804**	**837**
OM&A (M$)	**67**	**67**	**78**	**72**	**71**	**76**
- Base	59.7	61.9	68.7	62.2	63.7	67.0
- Projects (Totals from project listings)	6.9	5.3	9.7	10.0	7.7	8.7
Capital & MFA (M$)	**41**	**54**	**40**	**37**	**32**	**29**
- MFA	0.2	0.2	1.2	0.3	0.3	0.3
- Projects (Totals from project listings)	40.5	53.3	38.7	36.5	31.6	28.4
Total Regular Staff at YE	**313**	**319**	**318**	**307**	**309**	**309**
Temporary Staff FTEs	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**
Fuel/GRC & Other Water Rentals (M$)	**263**	**266**	**269**	**269**	**267**	**260**
Total Gross Labour ($M)	**42**	**43**	**45**	**47**	**47**	**49**
- Total Gross Regular	40.9	42.3	44.3	46.2	46.2	48.3
- Total Gross Temporary & Other	0.8	0.3	0.3	0.3	0.4	0.4
- Overtime	2.2	2.2	2.4	2.5	2.5	2.6
- Overtime (% of Gross labour)	**5.4**	**5.2**	**5.3**	**5.4**	**5.4**	**5.3**
Availability Factor %	**93.8**	**90.3**	**90.8**	**90.7**	**91.7**	**92.0**
Equivalent Forced Outage Rate (EFOR) %	**1.4**	**1.3**	**1.3**	**1.3**	**1.3**	**1.3**
Scheduled Outage Factor (SOF) %	5.1	8.7	8.1	8.3	7.3	6.9
Incapability Factor %	6.2	9.7	9.2	9.3	8.3	8.0
OM&A UEC ($/MW.h)	**3.4**	**3.5**	**4.0**	**3.8**	**3.6**	**3.7**
FUEC ($/MW.h) (GRC+Water Rentals)	**13.5**	**13.7**	**13.9**	**14.1**	**13.6**	**12.8**
PUEC ($/MW.h)	**16.9**	**17.2**	**17.9**	**17.9**	**17.3**	**16.5**
Contribution Margin (M$)	**403**	**380**	**393**	**390**	**465**	**502**
Capacity (MW)	**3302**	**3312**	**3312**	**3315**	**3320**	**3322**

Niagara Plant Group

Niagara Plant Group	2009 Forecast	2010	2011	2012	2013	2014
Energy TW.h	**12.4**	**12.4**	**12.4**	**12.1**	**12.7**	**13.4**
Total Revenue (M$)	**465**	**457**	**474**	**463**	**519**	**551**
OM&A (M$)	**45.8**	**44.4**	**53.4**	**46.3**	**47.7**	**50.1**
- Base	40.6	40.3	46.7	40.3	41.4	43.9
- Projects	5.2	4.0	6.7	6.0	6.3	6.3
Capital & MFA (M$)	**28.0**	**36.2**	**30.7**	**30.9**	**25.3**	**25.2**
- MFA	0.2	0.2	1.2	0.3	0.3	0.3
- Projects	27.8	36.0	29.5	30.6	25.0	24.9
Total Regular Staff at YE	**243**	**251**	**250**	**239**	**241**	**241**
Temporary Staff FTEs	**0**	**0**	**0**	**0**	**0**	**0**
GRC & Other Water Rentals (M$)	**167**	**172**	**175**	**174**	**173**	**166**
Total Gross Labour ($M)	**33**	**34**	**35**	**37**	**37**	**38**
- Total Gross Regular	31.9	33.4	35.0	36.5	36.2	37.9
- Total Gross Temporary & Other	0.7	0.3	0.3	0.3	0.3	0.4
- Overtime	1.9	1.9	2.0	2.1	2.2	2.2
- Overtime (% of Gross labour)	**6.0**	**5.7**	**5.8**	**5.8**	**6.0**	**5.8**
Availability Factor %	**89.5**	**88.2**	**89.5**	**88.3**	**90.0**	**89.1**
Equivalent Forced Outage Rate (EFOR) %	1.5	1.8	1.8	1.8	1.8	1.8
Scheduled Outage Factor (SOF) %	9.3	9.9	9.0	10.2	8.5	9.5
Incapability Factor %	10.5	11.8	10.5	11.7	10.0	10.9
OM&A UEC ($/MW.h)	**3.7**	**3.6**	**4.3**	**3.8**	**3.8**	**3.7**
GRC UEC ($/MW.h) (GRC+Water Rentals)	**13.5**	**13.9**	**14.1**	**14.4**	**13.7**	**12.4**
PUEC ($/MW.h)	**17.2**	**17.4**	**18.4**	**18.3**	**17.5**	**16.1**
Capacity (MW)	**2257**	**2267**	**2267**	**2270**	**2275**	**2277**

Key Programs & Issues

- Major rehabilitation/upgrade of SAB1 G9 in 2009/2010, G10 in 2013, G3 in 2012.
- Civil rehabilitation projects for SAB1 continue through planning period (e.g. concrete restoration, roof replacement, tailrace bridge and piers, etc.)
- DeCew Falls ND1 G8 scheduled for overhaul in 2011. Penstock replacement 2009 to 2011. Station Protection and control upgrades scheduled for 2011/2012.
- SAB PGS Unit rehabilitation on G2-5 planned for 2011-2014. PGS Unit transformers also scheduled for replacement 2009-11. Unit breakers and governors planned for replacement 2011-13.
- SAB 2 Station Service System Replacement 2010/2011 and Governor system upgrade 2013/2014
- Development and implementation of Niagara Bridge program including maintenance, divestment and investment ongoing. Divestiture of four bridges being pursued.
- Optimization Initiative – Niagara Optimization Working Group
- Continue to build and improve public franchise.
- Manage risks of equipment failures:
  - PGS Reliability & Turbine Leakage.
  - PGS Transformer failure. Replacement planned in 2010/11.

Saunders GS

Saunders GS (includes OSPG Support Costs)	2009 Forecast	2010	2011	2012	2013	2014
Energy TW.h	**7.1**	**6.9**	**7.0**	**7.0**	**7.0**	**7.0**
Total Revenue (M$)	**268**	**255**	**267**	**267**	**285**	**286**
OM&A (M$)	**16.2**	**13.6**	**16.0**	**17.6**	**15.4**	**16.7**
- Base	14.6	12.4	13.1	13.6	14.0	14.3
- Projects (Totals from project listings)	1.7	1.2	3.0	4.0	1.4	2.4
Capital & MFA (M$)	**12.7**	**17.3**	**9.2**	**5.9**	**6.6**	**3.4**
- MFA	0.0	0.0	0.0	0.0	0.0	0.0
- Projects (Totals from project listings)	12.7	17.3	9.2	5.9	6.6	3.4
Total Regular Staff at YE (Saunders Only)	**71**	**68**	**68**	**68**	**68**	**68**
Temporary Staff FTEs	**0.0**	**1**	**1**	**1**	**1**	**1**
GRC & Other Water Rentals (M$)	**96**	**94**	**94**	**94**	**94**	**94**
Total Gross Labour (M$)	**9**	**10**	**10**	**11**	**11**	**11**
- Total Gross Regular	8.6	9.8	10.2	10.7	11.0	11.4
- Total Gross Temporary & Other	0.1	0.0	0.0	0.0	0.0	0.0
- Overtime	0.4	0.3	0.3	0.3	0.4	0.4
- Overtime (% of Gross labour)	**4.2**	**3.2**	**3.1**	**3.1**	**3.2**	**3.2**
Availability Factor %	95.5	93.7	94.2	96.1	96.3	98.9
Equivalent Forced Outage Rate (EFOR) %	1.1	0.4	0.4	0.4	0.4	0.4
Scheduled Outage Factor (SOF) %	3.6	6.0	5.5	3.6	3.4	0.8
Incapability Factor %	4.5	6.3	5.8	3.9	3.7	1.1
OM&A UEC ($/MW.h)	**2.3**	**2.0**	**2.3**	**2.5**	**2.2**	**2.4**
FUEC ($/MW.h)	**13.6**	**13.5**	**13.5**	**13.5**	**13.5**	**13.5**
PUEC	**15.8**	**15.5**	**15.8**	**16.1**	**15.7**	**15.9**
Capacity (MW)	**1045**	**1045**	**1045**	**1045**	**1045**	**1045**

Key Programs & Issues

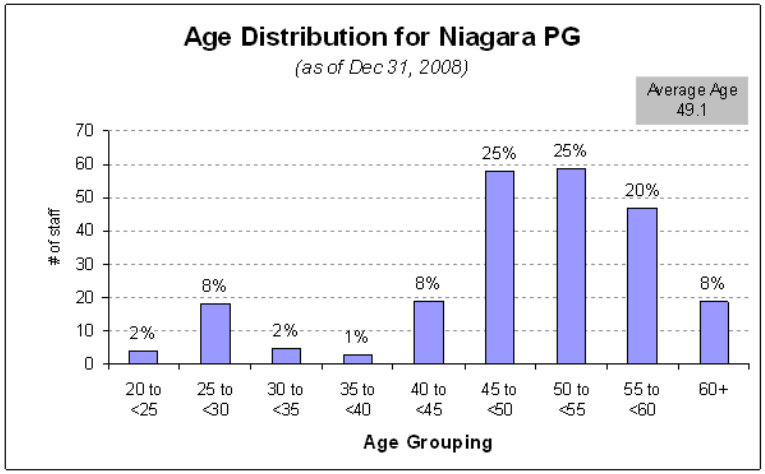
- Protection and Controls replacement project (2009 to 2011).
- St. Lawrence Power Development Visitor Centre to be completed in 2010 (part of Saunders GS capital costs)
- Barnhardt Island Bridge Repainting – Joint Works (NYPA Project) in 2012
- Ice Sluices Deck and Steel Support Beam Rehabilitation in 2011
- NYPA Joint Works including the Barnhardt Island Bridge repairs, inspection of Long Sault Dam and crane lead abatement totals $5.5M

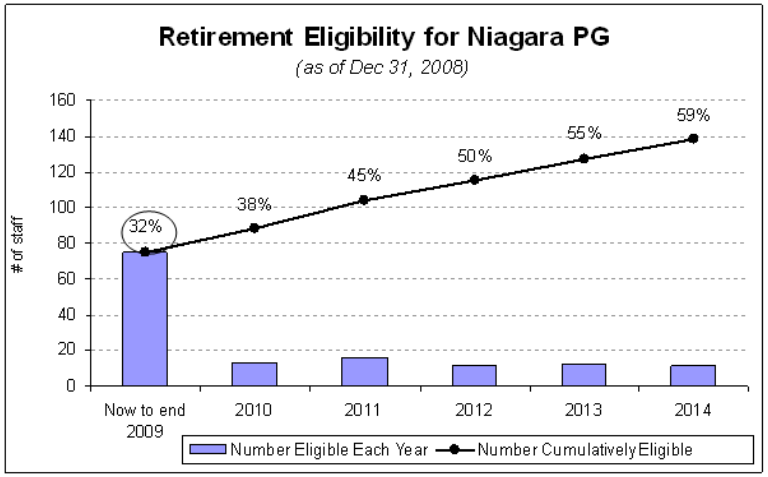
Issues/Risks:

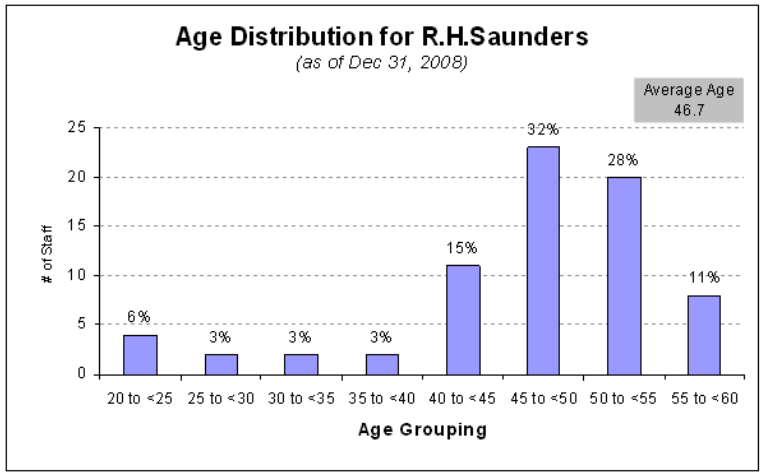
- American eel mitigation funding included at ($540-$685k per year). Improved Eel Ladder was installed in 2009.
- Saunders concrete growth rate faster than expected. Monitoring continues. Could require re-slotting in 3 to 8 yrs.

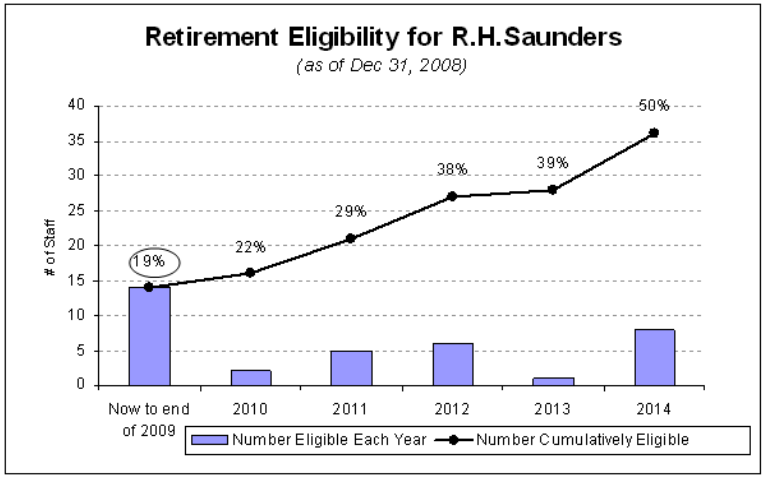
Human Resources – Demographics (Regulated Plants)

- 32% of Niagara staff are eligible to retire by end of 2009 and 59% by end of 2014. Demographics and retirement eligibility at R.H. Saunders are better than Niagara, but still an issue.









- Due to the staff shortages in engineering / project support and some trades areas, it has been a challenge to complete the planned 2009 work program in Niagara.
- To address the demographic issue, Niagara is adding apprentices and operating trainees, as well as engineers and contract monitors. The apprentices will overlap with experienced trades staff for training and knowledge transfer. Staff complement at Niagara will increase from 243 in 2009 to 250 in 2011, and decline to 241 in 2013/4.

Numbers may not add due to rounding.

Table 1
Operating Costs Summary - Regulated Hydroelectric ($M)

Line No.	Cost Item	2007 Actual	2008 Actual	2009 Actual	2010 Budget	2011 Plan	2012 Plan
		(a)	(b)	(c)	(d)	(e)	(f)
	OM&A:						
1	**Base OM&A**	78.6	53.9	61.5	61.8	68.7	62.2
2	**Project OM&A**	7.0	14.6	9.1	5.3	9.7	10.0
3	**Allocation of Corporate Costs**	21.9	26.3	24.9	25.1	24.8	26.3
4	**Allocation of Centrally Held Costs**	16.1	14.6	17.4	20.3	22.9	25.5
5	**Asset Service Fee**	2.3	2.5	2.6	2.0	2.1	2.0
6	**Total OM&A**	125.9	111.8	115.5	114.4	128.2	125.9
7	**Gross Revenue Charge**	241.8	253.5	259.6	257.2	257.1	252.2
	Other Operating Cost Items:						
8	**Depreciation and Amortization**	68.5	63.9	67.1	63.9	65.6	65.0
9	**Income Tax**	0.0	0.0	23.0	16.5	30.6	27.4
10	**Capital Tax**	8.8	8.7	8.6	2.9	N/A	N/A
11	**Property Tax**	0.0	0.0	0.0	0.0	0.0	0.0
12	**Total Operating Costs**	445.0	437.9	473.8	454.9	481.5	470.5

BASE OM&A - REGULATED HYDROELECTRIC

1.0 PURPOSE

This evidence presents the regulated hydroelectric base OM&A costs for the historical years, bridge year and test period.

2.0 OVERVIEW

This evidence supports the approval sought for the proposed regulated hydroelectric base OM&A for the test period. The regulated hydroelectric base OM&A expenses for 2007 - 2012 are provided in Ex. F1-T2-S1 Table 1. The test period base OM&A expenses are $68.7M and $62.2M in 2011 and 2012, respectively.

Base OM&A costs represent the resources required to fund routine, day-to-day operations and maintenance-related activities in support of the production of electricity from OPG's regulated hydroelectric generating units, along with associated administration and Hydroelectric Central Support Group costs.

3.0 REGULATED HYDROELECTRIC BASE OM&A

The regulated hydroelectric OM&A budget is established through the annual business planning process (see Ex. A2-T2-S1 and Ex. F1-T1-S1). Base OM&A expenditures for OPG's regulated hydroelectric facilities are attributed on a work program basis, consistent with how costs are incurred. Base OM&A budgets are attributed to each of the plant groups based on the following work programs: operations, maintenance, and administration support.

Operations costs include all direct costs to operate the generating facilities for the purpose of generating electricity or producing other related products (e.g., ancillary services required by the electricity system). These costs include costs for control room operators, water management activities including dam operations, dam safety surveillance inspections, waterway patrol, water flow monitoring/snow surveys, ice breaking, and log operations. These costs also include OPG's portion of all joint works

operations costs, shared with the New York Power Authority ("NYPA") pursuant to Joint Works Agreements.

Maintenance includes all costs associated with the direct maintenance of the facilities to ensure their normal, safe, and environmentally sound operation. Base maintenance activities are programmed by the type of work: preventive (to reduce the need for corrective maintenance), corrective (to address breakdowns), and emergent (condition based maintenance, resulting from inspections). Work is also categorized by the following objectives: regulatory (e.g., health and safety, dam safety, and environment) and contractual obligations (e.g., joint works), and maintain condition/sustaining.

Maintenance plans are established in a maintenance management system. The plans are used to prioritize work execution and used to support budget requirements. As indicated in Ex. F1-T1-S1, investment in hydroelectric facilities (including base OM&A funding) is determined using a structured portfolio approach, and streamlined reliability centred maintenance principles. The maintenance work program also includes OPG's portion of the maintenance costs for joint works, which are shared with NYPA.

Administration costs within the plant groups include all common support costs incurred for the production facilities that are not directly related to the production of electricity. This includes: Asset Management and Technical Support Services, Project Management, Human Resources and other Support Services, Finance, and the Plant Manager's Office. A program to divest certain Niagara Plant Group bridges is also included with the Niagara Plant Group's administrative costs from 2009 - 2011.

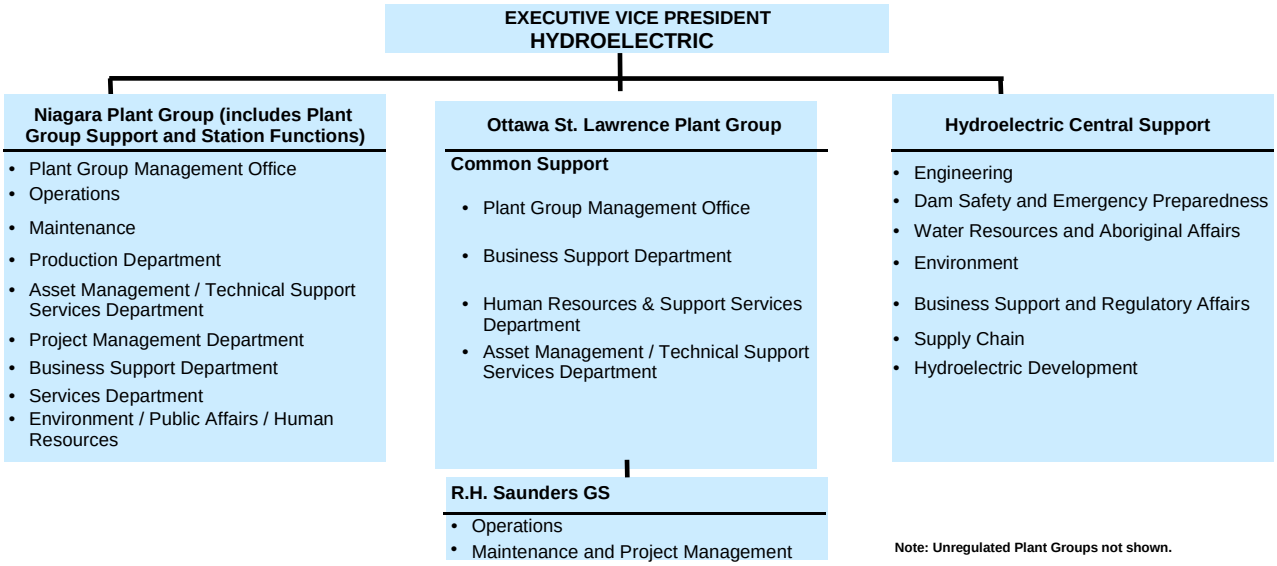
OPG owns several bridges in the Niagara Region. OPG has ongoing maintenance responsibilities for these roadway bridges and has legal obligations to maintain them during their service life and replace them at end of life. A strategy has been put in place to divest the bridges to the local municipalities or regions on mutually agreed terms and conditions, thereby reducing the future costs, liabilities, and risks to OPG.

The year-over-year variances in base OM&A expenditures for the historical, bridge and test years are discussed in Ex. F1-T2-S1. Exhibit F1-T2-S1 Table 1 provides a summary of base OM&A over the 2007 - 2012 period.

Detailed descriptions of the OM&A costs for the Niagara Plant Group and R.H. Saunders are provided below in sections 3.1, 3.2, and 3.3. Section 3.3 also describes the Ottawa - St. Lawrence Plant Group common support costs and the methodology for allocating these to R.H. Saunders. This level of allocation exists only for R.H. Saunders as a result of it being the only regulated facility within the Ottawa - St. Lawrence Plant Group. Since the Niagara Plant Group is comprised entirely of regulated facilities, no such allocation is necessary.

In addition to the costs incurred within the plant groups, certain other costs incurred to support the regulated hydroelectric facilities are provided on a centralized basis. The Hydroelectric Central Support Groups' costs include functions and activities not provided within the plant groups such as specialized Engineering, Business Support and Regulatory Affairs, Water Resources and Aboriginal Affairs, Dam Safety and Emergency Preparedness, Environment, Hydroelectric Development, and Supply Chain. Section 3.4 includes a description of these Hydroelectric Central Support Groups, and section 3.5 describes the methodology for allocating their costs to the Niagara Plant Group and R.H. Saunders.

Hydroelectric Organization



3.1 Niagara Plant Group Costs

The following Niagara Plant Group departments operate under the Niagara Plant Group Manager:

- Human Resources Department
- Business Support Department
- Production Department
- Asset Management and Technical Support Services Department
- Project Management Department
- Services Department

3.1.1 Human Resources Department

The Human Resources Department provides plant group support in the areas of employee services, labour relations, vacancy management, health and safety, disability management, compensation, and pay services. The staff associated with these functions form part of OPG's Corporate Human Resources Department and the costs associated with supporting the Niagara Plant Group are allocated through the cost allocation process described in Ex. F4-T4-S1. Also reporting to the Manager of the Human

Resources Department are eight full time staff directly funded by the Niagara Plant Group providing support for public affairs, stakeholder relations, community relations services, environmental services and local training program co-ordination functions within the Niagara Plant Group. Their costs are budgeted, collected, and reported in the Niagara Plant Group under the appropriate program rather than allocated through the cost allocation process described in Ex. F4-T4-S1.

Starting in 2010, all trainees have been assigned to a training organization for administrative, control and tracking purposes. This organization is overseen by a training co-ordinator who manages the training program and all associated costs. However, direct day-to-day supervision for trainees is provided by their respective Plant Group departments. In 2011, there are expected to be 20 trainees in this group by year end. These trainees are part of the Niagara Plant Group's staff compliment and their costs are included in the base OM&A budget.

3.1.2 Business Support Department

The Business Support Department, which is managed by the Site Controller, provides financial management and materials management support to the Niagara Plant Group. This department is responsible for coordinating the budgeting process, performing financial assessments on all business cases related to the Niagara Plant Group and its facilities, and monitoring adherence to corporate policies with respect to business expenses, procurement, and internal control. The staff associated with these functions are part of OPG's Finance Group and the costs of supporting the Niagara Plant Group are allocated through the corporate cost allocation process described in Ex. F3-T1-S1. In addition, also reporting to the Site Controller are four full time staff directly funded by the Niagara Plant Group providing support for material management by operating the plant group's stores function, including purchasing material performing all shipping and receiving functions, and inventory and warehousing controls. Their costs are part of the plant groups staff complement, and, as such, are included as part of the plant group direct costs.

3.1.3 Production Department

The Production Department's function is to operate and maintain the regulated generation assets to produce electrical capacity and energy and energy-related products and services at targeted performance levels. The scope of required work includes: operation and maintenance of the Sir Adam Beck I, Sir Adam Beck II, and Sir Adam Beck Pump Generating Station ("PGS"), and DeCew Falls I, Decew Falls II and all associated water conveyance structures in accordance with approved plans and applicable policies, contracts, and legal requirements. The department is managed by a Production Manager. All costs associated with the Production Department are budgeted, collected and reported in the Niagara Plant Group OM&A budget. In 2011, there are expected to be 96 staff (year-end headcount) supporting the requirements of the Production Department.

3.1.4 Asset Management and Technical Support Services Department

The Asset Management and Technical Support Services Department provides specialist expertise in the area of business strategy, planning, programming, asset portfolio management, decision support, business effectiveness, due diligence, and engineering governance. The department also assists in ensuring the Niagara Plant Group meets its targets for capacity and energy, including energy-related products and services, as well as providing staff specialist expertise in the area of generation asset management consistent with Hydroelectric strategies, policies and programs.

The department is managed by the Asset Management and Technical Services Manager ("Asset Manager") and has two sub-departments, the Technical Services Department and the System Support Department. The Technical Services Department provides electrical, mechanical and civil engineering services, as well as technical services (separate and distinct from the services provided by the central Engineering group that will be discussed below in section 3.4.1), dam safety management, management systems coordination (including registration for the International Organization for Standardization), compliance with Market Rules, as well as providing liaison services between the plant group and central Hydro Engineering. The System Support

Department provides drafting, clerical, administrative, records management, and information technology processes and services to the plant group. All costs associated with the department are budgeted, collected and reported in the Niagara Plant Group OM&A and capital budgets. In 2011, there are expected to be 36 staff (year-end headcount) supporting the functions of the Asset Management and Technical Support Services Department.

3.1.5 Project Management Department

The Project Management Department is responsible for delivering projects at targeted levels of performance and results. The scope of the assigned work includes the management and execution of projects in support of the Asset Manager. The department is responsible for the execution of all Niagara Plant Group controlled capital and non-standard projects and includes a Site Project Group, Engineering Management Group, and a rehabilitation crew. In 2011, there are expected to be 28 staff (year-end headcount) executing the responsibilities of the Project Management Department and the costs associated with their services are budgeted, collected, and reported against the Niagara Plant Group capital and OM&A budgets. In the event there is less project work than budgeted, labour costs not associated with project work are recorded as base OM&A.

3.1.6 Services Department

The Services Department is responsible for an annual work program which supports the needs of the Niagara Plant Group that are not part of operations and maintenance activities directly associated with production equipment. The department is managed by the Services Manager and has three sections: River Control Operations, Field Services, and Shop Services. River Control Operations provides 24 hour staffing of the Niagara International Control Works in order to manage the Niagara River water flows in accordance with the International Boundary Waters Treaty. Other activities include: outside maintenance, snow removal, ice breaker operations, maintenance of transport and work equipment, and property maintenance related to generating facilities. The department is also responsible for the joint works program as agreed with New York

Power Authority ("NYPA") under the Joint Works Agreement. The Shop Services section provides specialized machine shop services and welding shop services to the Niagara Plant Group. In 2011, there are expected to be 57 staff (year-end headcount) in this department.

All costs associated with the joint works program are budgeted, collected, and reported in accordance with the Joint Works Agreements. All costs associated with the Niagara Plant Group regulated facilities and structures are budgeted, collected and reported in the Niagara Plant Group OM&A budget.

3.2 R.H. Saunders Generating Station Costs

The R.H. Saunders Production/Project Department manages the station to produce electrical capacity and energy and energy-related products and services at targeted performance levels. The scope of required work includes: operation and maintenance of the station in accordance with approved plans and applicable policies, contracts, and legal requirements. Almost all of the OM&A budget for R.H. Saunders is comprised of maintenance and operations expenses. Starting in 2008, the Production/Project Department assumed responsibility for the management of all capital and OM&A projects at the station. All other services are provided to R.H. Saunders from either the Ottawa - St. Lawrence Plant Group or by Hydroelectric Central Support Groups, both of which are discussed in subsequent sections of this exhibit. The R.H. Saunders Production/Project Department staff complement has remained relatively stable around the planned number of 68 staff. Similarly, excluding extraordinary items, the OM&A budget has also remained relatively stable**.**

Operations expenses include control room operations, which will have a total staff of 15 (year-end headcount) in 2011, responsible for various water management activities such as: dam operations, waterway patrol, water flow monitoring, and ice management, and all joint works operations expenses shared with NYPA.

Maintenance plans have been developed for R.H. Saunders based on streamlined reliability centred maintenance practices (Ex. A1-T4-S2). Base maintenance activities are categorized by these objectives: regulatory, maintain condition, contractual (i.e., NYPA joint works), dam safety, environmental, policy, and health and safety. There are expected to be 53 staff (year-end headcount) supporting the maintenance programs and project execution in 2011, including the production/project manager and two first line managers for the electrical and mechanical trades, who also manage engineering support, clerical, and supply chain activities.

3.3 Ottawa - St. Lawrence Plant Group Common Costs

This section describes the Ottawa - St. Lawrence Plant Group central departments and explains the methodology for allocating a portion of their costs to R.H. Saunders.

There are four departments in the Ottawa - St. Lawrence Plant Group providing support services to R.H. Saunders. Effective 2008 the Project Management Department was amalgamated with the Production Departments in the Plant Group. This has resulted in the project management resources becoming a direct base OM&A expense, replacing the allocation of these costs that existed previously.

The Plant Group Management Department leads, manages, and supports the provision of common services. The Human Resource and Support Services Department provides a range of common services and expertise, and supplies public affairs, stakeholder relations, and community relations services. Effective 2010 the environmental section that was part of the Human Resource and Support Services Department was reorganized into the Asset Management and Technical Services Department to better align accountabilities and resources. The Business Support Department provides general administrative support, fleet management administration, accounts receivables and payables, procurement support for project execution, and the administration of project management enterprise systems. The total cost of these three groups is allocated to R.H. Saunders based on its proportion of the total budgeted base OM&A within the Ottawa - St. Lawrence Plant Group. Base OM&A is generally linked to the size

of the station and its generation and therefore provides a reasonable basis for allocating common services costs as discussed below.

The Asset Management and Technical Support Services Department provides specialist expertise in the area of business strategy, planning, programming, asset portfolio management, decision support, business effectiveness, due diligence, and engineering governance. The department also provides electrical, mechanical, and civil engineering services (separate and distinct from the more specialized services provided by the central Engineering Group discussed below), information and records management services, and is responsible for business programming and performance reporting functions.

R.H. Saunders is already resourced to provide the vast majority of asset management and engineering support so the level of support provided from Asset Management and Technical Support Services Department is fairly modest. In addition, R.H. Saunders is resourced to provide all of its own information and records management functions. As such, based on management's estimates, 15 per cent of the asset management and engineering services costs and none of the information and records management function costs from this department are allocated to R.H. Saunders.

Effective 2010 the Environmental Section, comprising four staff, was reorganized into the Asset Management Department. This reorganization does not impact the level of services provided by the Environmental Section to R. H. Saunders, and, therefore, environmental support costs will continue to be allocated to Saunders based on its proportion of the total budgeted base production OM&A within the Ottawa/St.Lawrence Plant Group.

Overall, approximately 20 per cent of the costs associated with the four common support service departments are allocated to R.H. Saunders. The allocations were made in accordance with the methodology recommended by R.J. Rudden Associates and Black & Veatch Corporation as described below in section 3.5.

3.4 Hydroelectric Central Support Groups Descriptions

The following Hydroelectric Central Support Groups' costs are allocated in part to the regulated facilities:

- Engineering
- Dam Safety and Emergency Preparedness
- Water Resources and Aboriginal Affairs
- Business Support and Regulatory Affairs
- Environment
- Hydroelectric Development
- Supply Chain
- Executive Vice President's Office

The Hydroelectric Central Support Groups provide common or specialized services to all of OPG's hydroelectric plant groups, both regulated and non-regulated. This section provides a brief description of the functions and key activities of each central support group. Section 3.5 describes the methodology used to allocate costs to the regulated and non-regulated facilities.

3.4.1 Engineering

The Engineering Division provides specialized civil, mechanical, and electrical engineering support to all the hydroelectric plant groups. It includes three main departments - Civil, Mechanical, and Electrical Engineering.

The Civil Engineering Department provides expertise in the following areas:

- Structural
- Geotechnical
- Instrumentation
- Hydrotechnical (hydraulics and hydrology)
- Specialized inspection and maintenance support
- Owner's engineer and advice for projects
- Dam safety engineering

- Dam performance monitoring, instrumentation, assessment, data management, and reporting
- Dam safety emergency response support
- Geographic Information System
- Drafting Governance

The Mechanical Engineering Department provides expertise in the following areas:

- Hydraulic turbines
- Sluice and head gates
- Cranes
- Piping
- Non-destructive examinations

The Electrical Engineering department provides expertise in the following areas:

- Hydro generators
- Power transformers
- Breakers
- Rotating exciters
- Grounding
- Protections
- Static exciters / voltage regulators
- Metering
- Governor controls
- Market compliance
- NERC Cybersecurity

The Engineering Division has 61 staff (2011 year-end headcount), consisting of engineers, technicians, and clerks.

3.4.2 Dam Safety and Emergency Preparedness

The Dam Safety and Emergency Preparedness Group, which has five staff (2011 year-end headcount), provides oversight and guidance on dam safety and emergency preparedness at all of OPG's dams. Key elements of their program include oversight of dam-related comprehensive inspections, assessments, design reviews, monitoring, safety upgrades, and personnel training as follows:

- Develop and maintain a managed system for dam safety, waterways public safety and emergency preparedness programs, including establishing program objectives, scope, accountabilities, assessment and reporting.
- Develop and maintain the hydroelectric standards for emergency preparedness, provide oversight on tests, drills and exercises, and coordinate participation with corporate emergency preparedness as required.
- Develop and maintain dam safety governance documents and technical standards that are aligned with regulations, corporate policy and industry best practices.
- Assess compliance with regulations, corporate dam safety policy and programs for waterways public safety and emergency preparedness, provide advice to meet/maintain compliance.
- Report annually to the OPG Board of Directors on the results of the dam and waterways public safety program and regular updates on emerging dam and public safety issues.

3.4.3 Water Resources and Aboriginal Affairs

The Water Resources and Aboriginal Affairs Group, which has 14 staff (2011 year-end headcount), provides business level expertise and services for the management of water resources and Aboriginal relations including:

- Water management policy and planning (negotiating, establishing, and maintaining relationships with regulatory agencies and boards)
- Energy forecasting
- Administration of agreements (e.g., water power leases, licenses of occupation, crown leases, Parks Canada, Quebec, and water conveyance)
- Day-ahead coordination of hydroelectric resources

- Integration of capacity and energy forecasts submitted by plant groups
- Aboriginal relations
- Leading past grievance negotiations with First Nations and administering payments associated with settled past grievances

3.4.4 Business Support and Regulatory Affairs

The Business Support and Regulatory Affairs Division, which has 14 staff (2011 year-end headcount), provides business-related oversight/support for the EVP - Hydroelectric and support to all of the plant groups in the following areas:

- Business planning and budgeting (five year time horizon)
- Strategic Planning
- Performance reporting
- Production support and integration (e.g., Maintenance Module for Streamlined Reliability Centred Maintenance)
- Benchmarking
- Market operations support
- Asset management oversight in areas such as project prioritization and life cycle planning
- Annual incentive plan development and monitoring for Hydroelectric Management
- Interface with corporate support groups as required
- Regulatory support for OPG's rate filing
- Centralized document management support for the hydroelectric business

3.4.5 Environment

The Environment Division, which has seven staff (2011 year-end headcount), provides environmental oversight for the EVP-Hydroelectric. In addition, this division supports the business by providing expertise and services in a wide range of environmental areas including:

- ISO 14001 Environmental Management Systems
- Legislative monitoring and compliance

- Aquatic and terrestrial biology
- Environmental assessments
- Environmental approvals
- Land, water, and waste management
- Environmental risk management

3.4.6 Hydroelectric Development

Hydroelectric Development's role is to expand and re-develop OPG's existing sites as well as to develop new locations where feasible. This group identifies, studies, plans, and oversees the conceptual work, design and execution of hydroelectric re-development and new development projects (e.g., Niagara Tunnel project). The group includes the Vice President of Hydroelectric Development, project managers, project engineers, and project specialists. In 2011, there are expected to be 41 staff (year-end headcount) in this group. The work program is primarily capital in nature. However, before a project is approved and released, costs incurred for conceptual and preliminary engineering studies are classified as OM&A expenses. There are also general OM&A expenses incurred by this group that must be allocated to the Plant Groups. These include costs to maintain a hydroelectric developments database, develop and provide information to the Ontario Power Authority (e.g., Integrated Power System Plan process), and interface with the various government ministries (Ministry of Natural Resources, Ministry of the Environment, and Ministry of Finance) with respect to hydroelectric developments.

3.4.7 Hydroelectric Supply Chain

The Supply Chain Division, which has 13 staff (2011 year-end headcount), provides procurement support activities and materials management activities for all the hydroelectric plant groups and Hydroelectric Development.

3.4.8 Executive Vice President's Office

The costs budgeted in this category include various expenses incurred by the EVP - Hydroelectric, including travel, administrative support and membership costs in various

hydroelectric associations, such as the International Hydropower Association and Canadian Hydropower Association. In 2011 there are expected to be two staff (year-end headcount) in this category.

3.5 Allocation Methodology for Hydroelectric Central Support Cost

The method for allocating Hydroelectric Central Support Group Costs was reviewed by R.J. Rudden Associates in 2006 and Black & Veatch Corporation in 2009, as part of an OPG-wide review (Ex. F3-T1-S1). R.J. Rudden Associates recommended that as a general principle, direct assignment (i.e., time estimates or management estimates of full time equivalents dedicated to a particular group) should be used where practical and efficient, and base OM&A costs should be used to allocate all other central support group costs that cannot be directly assigned. The recommendations were implemented by OPG starting in 2006. R.J. Rudden also reviewed the allocation of Ottawa - St. Lawrence common costs to R.H. Saunders and its recommendations were adopted (see allocation methodology in section 3.3 above).

With respect to Hydroelectric central support costs, R.J. Rudden Associates and Black & Veatch recommended the use of plant group base OM&A costs to allocate central costs that cannot be directly assigned or where it is inefficient to perform direct assignment. This includes costs for the office of the EVP - Hydroelectric, Business Support and Regulatory Affairs, Water Resources and Aboriginal Affairs, Dam Safety and Emergency Preparedness and Environment. OPG accepted this recommendation and uses the base OM&A approach to allocate planned and actual costs for each of these central support groups.

As described below, a direct assignment approach was generally used for Engineering, Supply Chain and Hydroelectric Development (except the Hydroelectric Development VP Office and Project Management Office costs).

3.5.1 Allocation of Engineering

The costs for Engineering services are allocated as follows:

- Estimates of engineering cost allocations for each year in the planning cycle are developed during the business planning/budgeting process. Each department in the Engineering Division develops time estimates for each of the plant groups (or plants in the case of R.H. Saunders) based on a high level review of each plant group's future work plans/projects and anticipated support requirements, as well as a review of previous year's historical engineering support costs for each plant group.
- Total engineering hours are then allocated to each plant group based on these reviews.
- The total engineering budget for the year is allocated using the ratio of estimated hours for each plant group divided by the total engineering hours. The 2011 and 2012 planned engineering allocations to each plant group are calculated by applying the 2010 ratios (i.e., the ratios developed as part of the 2010 - 2014 business planning process) to the forecast costs in 2011 and 2012, respectively.

3.5.2 Hydroelectric Development

Hydroelectric Development OM&A costs are either directly attributed to the regulated stations where applicable, or allocated based on the total cost estimates for development projects. If a project is in the pre-concept or concept phase, and is related to a regulated facility or site, then its costs are directly attributed to that site (e.g., the PGS Expansion Study). The costs associated with the office of the Vice President - Hydroelectric Development and the general OM&A expenses referred to above in section 3.4.6 are allocated based on estimated project expenditures. General OM&A costs are allocated based on the total estimates of capital and OM&A projects. Since the project portfolio varies year by year, the portion of general OM&A costs allocated to the regulated plants varies between 7 per cent and 17 per cent of the total hydroelectric development base OM&A costs over the period from 2007 - 2012.

3.5.3 Supply Chain

The allocation of Supply Chain costs is based on management's time estimates. Approximately three staff are dedicated to procurement and material management activities related to the regulated operations. Therefore, less than 30 per cent of the 11 person Supply Chain group's costs are allocated to the regulated operations. Allocation between the Niagara Plant Group and R.H. Saunders is based on further time estimates by management of the responsibilities assigned to staff. Two of the staff are assigned to the Niagara Plant Group and are physically located in Niagara, while the remaining staff person is dedicated to R.H. Saunders.

Numbers may not add due to rounding.

Table 1
Base OM&A - Regulated Hydroelectric ($M)

Line No.	Item	2007 Actual	2008 Actual	2009 Actual	2010 Budget	2011 Plan	2012 Plan
		(a)	(b)	(c)	(d)	(e)	(f)
	Base OM&A:						
1	**Niagara Plant Group**	38.3	44.6	46.7	47.2	53.5	46.3
2	**Saunders GS**	40.3	9.4	14.8	14.6	15.2	15.8
3	**Total Base OM&A**	78.6	53.9	61.5	61.8	68.7	62.2
	Labour[1]:						
4	**Niagara Plant Group**	26.7	28.2	27.8	30.1	31.3	33.0
5	**Saunders GS**	8.0	8.8	8.8	8.3	8.7	9.1
6	**Total Labour**	34.7	37.0	36.6	38.4	40.0	42.1

Notes:
1 Labour expense is included in Base OM&A.

Numbers may not add due to rounding.

Table 2
Base OM&A by Major Components - Regulated Hydroelectric ($M)

Line No.	Prescribed Facility	Labour	Materials	External Purchased Services	Other	Allocated Support Costs	Total Base OM&A
		(a)	(b)	(c)	(d)	(e)	(f)
	Budget - Calendar Year Ending December 31, 2007						
1	**Niagara Plant Group**	28.3	1.9	4.9	0.0	4.9	40.0
2	**Saunders GS**	8.0	1.0	1.7	1.1	2.8	14.6
3	**Total**	36.3	2.9	6.6	1.1	7.7	54.6
	Actual - Calendar Year Ending December 31, 2007						
4	**Niagara Plant Group**	26.7	3.5	6.0	(1.3)	3.4	38.3
5	**Saunders GS**	8.0	0.8	1.6	27.0	2.9	40.3
6	**Total**	34.7	4.3	7.6	25.7	6.3	78.6
	Budget - Calendar Year Ending December 31, 2008						
7	**Niagara Plant Group**	29.0	1.5	5.3	0.1	5.8	41.7
8	**Saunders GS**	8.5	1.0	1.7	0.5	2.7	14.4
9	**Total**	37.5	2.5	7.0	0.6	8.5	56.1
	Actual - Calendar Year Ending December 31, 2008						
10	**Niagara Plant Group**	28.2	3.4	7.8	0.5	4.7	44.6
11	**Saunders GS**	8.8	1.1	2.4	(5.4)	2.5	9.4
12	**Total**	37.0	4.4	10.2	(4.9)	7.2	53.9
	Budget - Calendar Year Ending December 31, 2009						
13	**Niagara Plant Group**	30.3	1.4	5.4	0.1	5.9	43.1
14	**Saunders GS**	8.9	1.0	1.7	0.4	2.8	14.8
15	**Total**	39.2	2.5	7.0	0.5	8.7	57.9
	Actual - Calendar Year Ending December 31, 2009						
16	**Niagara Plant Group**	27.8	3.1	6.5	4.9	4.4	46.7
17	**Saunders GS**	8.8	1.0	2.5	(0.1)	2.6	14.8
18	**Total**	36.6	4.1	9.0	4.8	7.0	61.5
	Budget - Calendar Year Ending December 31, 2010						
19	**Niagara Plant Group**	30.1	2.6	7.4	0.2	6.9	47.2
20	**Saunders GS**	8.3	0.9	2.3	0.0	3.1	14.6
21	**Total**	38.4	3.5	9.7	0.2	10.0	61.8
	Plan - Calendar Year Ending December 31, 2011						
22	**Niagara Plant Group**	31.3	2.4	12.7	0.3	6.8	53.5
23	**Saunders GS**	8.7	1.0	2.3	0.1	3.1	15.2
24	**Total**	40.0	3.4	15.1	0.4	9.9	68.7
	Plan - Calendar Year Ending December 31, 2012						
25	**Niagara Plant Group**	33.0	2.2	4.7	0.4	6.0	46.3
26	**Saunders GS**	9.1	1.0	2.4	0.1	3.2	15.8
27	**Total**	42.1	3.2	7.1	0.5	9.2	62.2

Numbers may not add due to rounding.

Table 3

Staff Summary - Regulated Hydroelectric

Line No.	Group	2007 Actual	2007 Budget	2008 Budget	2008 Actual	2009 Budget	2009 Actual	2010 Budget	2011 Plan	2012 Plan
		(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
1	**Niagara Plant Group Staff FTEs**	228.8	229.4	236.2	235.4	233.0	246.0	254.1	254.2	251.4
2	**Saunders GS Staff FTEs**	65.5	64.1	67.8	70.6	68.5	69.6	68.8	68.8	68.8
3	**Total Staff FTEs**	294.3	293.5	304.0	306.0	301.5	315.6	322.9	323.0	320.2

COMPARISON BASE OM&A – REGULATED HYDROELECTRIC

1.0 PURPOSE

This evidence presents period-over-period comparisons of base OM&A cost for the regulated hydroelectric facilities for 2007 - 2012.

2.0 OVERVIEW

This evidence supports the approval sought for regulated hydroelectric base OM&A for the test period. Exhibit F1-T2-S2, Tables 1, 2 and 3 set out the comparison of base OM&A by organizational unit over the 2007 – 2012 period. As per section 2.8.1 of the OEB Filing Guidelines, period-over-period changes under 10 per cent are not explained.

3.0 PERIOD-OVER-PERIOD CHANGES – BRIDGE YEAR AND TEST PERIOD

Exhibit F1-T2-S2 Table 1 sets out the Hydroelectric Central Support Groups OM&A budgets by organizational or functional area for the bridge year and test period. These costs are allocated to the Niagara Plant Group and R.H. Saunders, using the methodology described in Ex. F1-T2-S1. Table 1 does not include the corporate allocations, which are discussed in Ex. F3-T1-S1.

Exhibit F1-T2-S2 Table 2c identifies the Hydroelectric base OM&A costs for the Niagara Plant Group for the bridge year and test period. It includes the portion of Hydroelectric Central Support Group OM&A expenses allocated to the Niagara Plant Group for the same period. It does not include the corporate allocations which are discussed in Ex. F3-T1-S1.

Exhibit F1-T2-S2 Table 3c sets out the Hydroelectric base OM&A costs for R.H. Saunders for the bridge year and test period. It includes a base OM&A allocation from the Ottawa - St. Lawrence Plant Group (“OSPG”) support organizations and from the Hydroelectric Central Support Groups as per the methodology described in Ex. F1-T2-S1. It does not include the corporate allocations which are discussed in Ex. F3-T1-S1.

3.1 Period-over-Period Changes – Test Period

2012 Plan versus 2011 Plan

Cost changes from 2011 to 2012 for allocations from the Hydroelectric Central Support Groups, and R.H. Saunders, including allocations from the OSPG support organizations are under 10 per cent.

Administration costs for the Niagara Plant Group are planned to decrease by $6.9M from 2011 to 2012 due to the conclusion of the Niagara Bridge Divestiture Program as discussed in Ex. F1-T2-S1, section 3.0. Year-over-year variability in the Divestiture Program is due to changes in the number and size of the bridges dealt with in any given year. Cost changes in Niagara Plant Group operations and maintenance are less than 10 per cent.

2011 Plan versus 2010 Budget

Cost changes from 2010 to 2011 for allocations from the Hydroelectric Central Support Groups, and R.H. Saunders, including allocations from the OSPG support organizations are under 10 per cent.

Niagara Plant Group administration costs are forecast to increase by $5.1M in 2011 to $11.4M compared to the 2010 budget of $6.3M. The change is due to the Niagara Bridge Divestiture Program which increases from $1.8M in 2010 to $6.9M in 2011. Cost changes in operations and maintenance are less than 10 per cent.

3.2 Period-over-Period Changes – Bridge Year

2010 Budget versus 2009 Actual

The $3.1M increase in the amount of Hydroelectric Central Support Groups costs allocated in 2010 as compared to 2009 is due to increases in the following costs:

- New Geographic Information System (“GIS”) dam safety mapping and aerial photography costs and the addition of a GIS program coordinator in 2010. The GIS costs are included in the Engineering Division budget.
- Addition of engineering and water resources trainees to address demographic issues.

- Staffing additions in Engineering Services and other central support groups to address additional work programs (e.g., additional procurement requirements).
- The addition of a drafting specialist in the Engineering Division to perform specialized drafting governance and oversight activities. This service was previously provided by the Thermal Business Unit, but the position is being eliminated in 2010 due to planned coal station closures.
- Increased work and support associated with Hydroelectric Development including support for the Niagara Tunnel Project, and concept phase work on the potential Lake Gibson Development and the potential expansion of the Pump Generating Station ("PGS").
- Unused contingency in 2009 held by Executive Vice President ("EVP") – Hydroelectric for unforeseen critical work for the regulated assets.
- Year-over-year labour cost escalation.

Niagara Plant Group

Administration costs in 2010 are expected to be $2.0M lower than the 2009 actual costs. The Niagara Bridge Divestiture Program decreases from $4.0M in 2009 to $1.8M in the 2010 budget. Administrative costs for moving and training are expected to increase by $0.2M. Changes in costs from 2009 to 2010 for operations and maintenance are under 10 per cent.

R.H. Saunders Generating Station

For R.H. Saunders, base OM&A spending is budgeted to be $0.7M lower in 2010 when compared to the 2009 actual of $12.2M. The changes in operations, maintenance, and allocated OSPG common support costs are less than 10 per cent.

4.0 PERIOD-OVER-PERIOD CHANGES – HISTORICAL PERIOD

Exhibit F1-T2-S2 Table 1 presents the base OM&A costs for the Hydroelectric Central Support Groups that are allocated to the regulated facilities for the historical period.

Exhibit F1-T2-S2 Tables 2a and 2b present the base OM&A for the Niagara Plant Group for the historical period and includes the base OM&A costs allocated from the Hydroelectric Central Support Groups.

Exhibit F1-T2-S2 Tables 3a and 3b present the base OM&A for R.H. Saunders for the historical period and includes the allocated base OM&A costs from the Ottawa - St. Lawrence Plant Group Central Support Departments and the Hydroelectric Central Support Groups.

2009 Actual versus 2009 Budget

Hydroelectric Central Support Groups

The central support groups allocated costs were $1.7M or 23 per cent under budget in 2009 due to:

- Higher than planned attrition and unfilled vacancies across the central support groups (resulting in lower labour costs).
- Reduced allocations from Hydroelectric Development due to delays in concept phase work (e.g., Lake Gibson).
- Unused contingency in 2009 held by EVP – Hydroelectric for unforeseen critical work for the regulated assets.
- Lower than planned costs for implementation of the North American Electric Reliability Corporation ("NERC") Cyber Security Project.
- Reductions in the use of engineering consultants and other consultants (e.g., aboriginal relations consultant).
- Reductions in travel costs and discretionary expenditures.

Niagara Plant Group

The Niagara Plant Group Administration spending in 2009 was $3.6M over budget. In 2009, an additional $4.0M in costs were incurred for the Niagara Bridge Divestiture Program. Further additional costs of $0.9M were related to increased activity for environmental, dam safety, and public safety programs, $0.2M for moving and Training Costs, and $0.5M for assessment work on projects. These costs have been offset by a reduction in labour burdens of $0.2M and an overall reduction in labour costs due to staff vacancies of $1.8M. Maintenance and operation cost variances were under 10 per cent.

R.H. Saunders Generating Station

R.H. Saunders OM&A cost variances, including allocated OSPG common support costs, were under 10 per cent for 2009.

2009 Actual versus 2008 Actual

Hydroelectric Central Support Group

Cost changes from 2008 to 2009 for allocations from the Hydroelectric Central Support Groups, were under 10 per cent.

Niagara Plant Group

Operations costs in 2009 were $0.7M higher than 2008. This was due to a staff increase in hydroelectric operator trades trainees, and small increases in external purchased services and other costs. Administration costs increased by $4.1M due to the additional costs incurred for the Niagara Bridge Divestiture Program, and additional moving and training costs, offset by labour reductions due to delays in filling vacancies. Changes in maintenance costs were under 10 per cent.

R.H. Saunders Generating Station

R.H. Saunders direct OM&A spending in 2008 was $6.9M as compared to $12.2M in 2009. Excluding an extraordinary credit of ($5.2M) in 2008 related to a legal settlement, base spending remained essentially the same in the two years. Excluding the settlement credit, the remaining maintenance, operations, administration, and allocated OSPG support cost changes were under 10 per cent.

2008 Actual versus 2008 Budget

Hydroelectric Central Support Groups

Actual 2008 allocated costs were $1.3M under budget due to lower external purchased services expenditures for the NERC Cyber Security project, and delays in filling staff vacancies across the central support groups, especially in Engineering and Hydroelectric Development. The EVP - Hydroelectric contingency was also not required, saving about $0.3M.

Niagara Plant Group

Niagara Plant Group maintenance costs in 2008 were $4.4M higher than the budget. The additional spending was mainly incurred on certain one-time maintenance activities. With this work, the plant group addressed many issues related to the condition of its facilities and public safety concerns. The additional maintenance activities included several facility concrete repairs, overhauls of governor pumps at Sir Adam Beck PGS, replacement of lights and heaters at Sir Adam Beck II headworks for safety, Sir Adam Beck II intake guardrail repairs for public safety, Sir Adam Beck II overhead screen door replacement for safety, upgrades to elevators to increase reliability, repairs to the DeCew Falls I roof access ladder and platform, DeCew Falls II head works window replacements, fence upgrades at the lilac gardens for public safety, International Control Dam maintenance building HVAC replacement. In all, over 110 additional maintenance activities were undertaken in 2008, some of which had been planned for 2009. Due to the deferral of several OM&A projects in 2008, plant group staff was redeployed to perform maintenance work. Operations and administration cost variances were under 10 per cent.

R.H. Saunders Generating Station

This station's total base OM&A spending in 2008 was $6.9M. The budget level was $11.7M. Excluding an extraordinary credit of ($5.2M) in 2008 related to a legal settlement, other operating, maintenance, administration, and allocated OSPG support cost changes were under 10 per cent.

2008 Actual versus 2007 Actual

Hydroelectric Central Support Groups

Costs allocated from central support groups for 2008 were $1.2M higher than the costs in 2007 due to a number of factors:

- The addition of $0.5M in 2008 for definition phase work and implementation associated with the NERC Cyber Security standards. OPG was required to comply with these standards by the end of 2009.
- Under-spending in 2007 by all central support groups due to continuing attrition and delays in hiring ($0.9M). Several projects were deferred from 2007 to subsequent years

due to engineering staff shortfalls. An engineer-in-training program was initiated in 2007 to address existing staffing shortfalls and to supplement existing engineers expected to retire during 2008 - 2012. This program will continue through to 2011 to mitigate the impact of demographics.

- Addition of support staff to assist in activities associated with new internal controls, audit activities, regulatory activities and other due diligence activities ($0.4 M).
- Transfer of the EVP - Hydroelectric salary from a central corporate payroll cost centre to the hydroelectric cost centre ($0.2 M).
- Increases in labour rates and payroll burdens.

Niagara Plant Group

Maintenance costs for 2008 were higher than in 2007 by $2.9M. As described above in the 2008 actual versus budget discussion, an increased number of high priority base maintenance items were undertaken in 2008. The additional maintenance work was primarily aimed at safety issues such as fencing, and also to address the condition of Niagara Plant Group facilities.

Administration costs for 2008 were $2.0M higher than the 2007 actual cost of $2.2M. This cost increase was a result of lower than average administration costs for 2007, due to a one-time credit of $1.6M received from Hydro One for OPG's operations and maintenance support of Hydro One equipment located inside the Sir Adam Beck I powerhouse for the period dating back to the demerger of Ontario Hydro in 1999. In addition, administration spending increased approximately $0.5M as the result of hiring three additional staff combined with changes to labour rates and payroll burdens. Cost changes in operations are less than 10 per cent.

R.H. Saunders Generating Station

Excluding the extraordinary expense of $27.2M in 2007 and the extraordinary credit of ($5.2M) in 2008, which both related to a legal settlement, total OM&A spending at R.H. Saunders was $1.9M higher in 2008 than 2007 ($12.1M versus $10.2M).

Maintenance expenses for 2008 are $1.8M higher than the actual expenditures in 2007, but only $0.3M higher than the 2007 budget amount. The reasons for the lower actual maintenance spending in 2007, contributing to the relative increase for 2008, are outlined in the 2007 actual versus budget discussion below. Cost changes in operations are less than 10 per cent.

Ottawa/St. Lawrence Plant Group common costs decreased by $0.3M in 2008 as compared to the 2007 actual allocated costs. This is a result of the restructuring discussed in Ex. F1-T2-S1, section 3.3.

2007 Actual versus 2007 Budget

Hydroelectric Central Support Groups

Costs allocated from central support groups for 2007 were $1.4M under budget due to the following factors:

- Staffing under-variance due to staff departures and slower hiring ($0.5M)
- The EVP - Hydroelectric contingency was not required in 2007 ($0.3M)
- Lower consulting costs ($0.2M)
- Labour rate under-variance due to a difference between the demographic plan assumptions and the actual demographics (i.e., actual staff mix starting to get younger, thereby reducing the average rate)

Niagara Plant Group

Total base OM&A spending in 2007 was $0.4M less than budget ($34.8M versus the budget of $35.2M). Spending in operations was $2.0M below plan as a result of contingency funds budgeted in operations being transferred to maintenance activities. Additional maintenance activities resulted in approximately $3.7M in additional costs. These activities included unplanned maintenance activities necessary to maintain generators in operation, health and safety improvements, and additional field service work for snow removal, fence repair, and public safety signage. As described in Ex. F1-T2-S1, the Production Department is responsible for both the operation and maintenance of the Niagara Plant Group facilities. Its

budget includes a contingency to address unforeseen events that could impact the performance of the Niagara generating stations.

Administration costs were approximately $2.1M below budget mainly due to the one-time cost recovery from Hydro One of $1.6M described above in the 2008 Plan versus 2007 Actual discussion. In addition, a cost transfer from administration to maintenance of approximately $0.4M resulted from the shifting of project staff from the Projects Department to the Production Department. The transfer was a result of using contract labour for the Sir Adam Beck I G7 Frequency Conversion project. The administration budget held funding for the project staff to cover time not spent on projects such as training, and health and safety meetings.

R.H. Saunders Generating Station

Total base OM&A spending in 2007 was $37.4M versus the budget of $11.7M. This was the result of an extraordinary item ($27.2M) related to the settlement of a past grievance with a First Nation. Excluding that expense, total base OM&A spending in 2007 was $1.5M below budget.

Maintenance expenses were $1.5M below plan as a result of the following changes cost containment for OPG's portion of the American eel studies and initiatives ($0.7M), lower joint works expenses than estimated from the New York Power Authority ($0.3M), staff vacancies, shifting of maintenance staff to execute projects, and the deferral of some community initiatives and activities.

Cost variances for R.H. Saunders operations and Ottawa/St. Lawrence Plant Group common cost allocations were less than 10 per cent.

Numbers may not add due to rounding.

Table 1
Comparison of Base OM&A ($M)
Central Support Groups - Regulated Hydroelectric

Line No.	Group	2007 Budget	(c)-(a) Change	2007 Actual	(e)-(c) Change	2008 Actual	(e)-(g) Change	2008 Budget
		(a)	(b)	(c)	(d)	(e)	(f)	(g)
1	**Business Support & Reg'ty Affairs**	0.6	(0.2)	0.4	0.2	0.6	(0.1)	0.7
2	**Water Resources & Aboriginal Affairs**	1.0	(0.1)	0.9	0.1	1.0	(0.1)	1.1
3	**Dam Safety & Emergency Prep**	0.4	(0.1)	0.3	0.1	0.4	(0.0)	0.4
4	**Environment**	0.5	(0.1)	0.4	0.1	0.5	(0.0)	0.5
5	**Supply Chain**	0.6	(0.0)	0.5	0.0	0.5	(0.1)	0.6
6	**Hydroelectric Development**	0.3	(0.1)	0.3	(0.1)	0.1	(0.2)	0.3
7	**Engineering Services**	2.2	(0.2)	2.1	0.2	2.2	(0.2)	2.4
8	**EVP Office**	0.8	(0.7)	0.1	0.7	0.8	(0.7)	1.5
9	**Total**	6.3	(1.4)	4.9	1.2	6.1	(1.3)	7.5

Line No.	Group	2008 Actual	(c)-(a) Change	2009 Actual	(c)-(e) Change	2009 Budget
		(a)	(b)	(c)	(d)	(e)
10	**Business Support & Reg'ty Affairs**	0.6	(0.1)	0.5	(0.2)	0.8
11	**Water Resources & Aboriginal Affairs**	1.0	(0.0)	0.9	(0.1)	1.1
12	**Dam Safety & Emergency Prep**	0.4	0.0	0.4	0.0	0.4
13	**Environment**	0.5	(0.0)	0.4	(0.1)	0.5
14	**Supply Chain**	0.5	(0.0)	0.5	(0.1)	0.6
15	**Hydroelectric Development**	0.1	(0.0)	0.1	(0.3)	0.4
16	**Engineering Services**	2.2	0.4	2.6	(0.0)	2.6
17	**EVP Office**	0.8	(0.4)	0.3	(0.9)	1.2
18	**Total**	6.1	(0.3)	5.8	(1.7)	7.6

Line No.	Group	2009 Actual	(c)-(a) Change	2010 Budget	(e)-(c) Change	2011 Plan	(g)-(e) Change	2012 Plan
		(a)	(b)	(c)	(d)	(e)	(f)	(g)
19	**Business Support & Reg'ty Affairs**	0.5	0.2	0.7	0.0	0.7	(0.0)	0.7
20	**Water Resources & Aboriginal Affairs**	0.9	0.2	1.2	0.0	1.2	(0.0)	1.2
21	**Dam Safety & Emergency Prep**	0.4	0.1	0.5	0.0	0.5	(0.0)	0.5
22	**Environment**	0.4	0.1	0.5	0.0	0.5	0.1	0.6
23	**Supply Chain**	0.5	0.2	0.7	0.0	0.7	(0.0)	0.6
24	**Hydroelectric Development**	0.1	1.2	1.2	0.1	1.3	(0.8)	0.6
25	**Engineering Services**	2.6	1.0	3.6	(0.4)	3.2	0.1	3.3
26	**EVP Office**	0.3	0.2	0.6	0.0	0.6	(0.0)	0.6
27	**Total**	5.8	3.1	8.9	(0.2)	8.7	(0.7)	8.0

Numbers may not add due to rounding.

Table 2a
Comparison of Base OM&A ($M)
Niagara Plant Group

Line No.	Group	2007 Budget	(c)-(a) Change	2007 Actual	(e)-(c) Change	2008 Actual	(e)-(g) Change	2008 Budget
		(a)	(b)	(c)	(d)	(e)	(f)	(g)
	Niagara Plant Group:							
1	**Operations**	7.6	(2.0)	5.6	0.2	5.8	(0.3)	6.1
2	**Maintenance**	23.3	3.7	27.0	2.9	29.9	4.4	25.5
3	**Administration**	4.3	(2.1)	2.2	2.0	4.2	(0.1)	4.3
4	**Total Niagara Plant Group**	35.2	(0.4)	34.8	5.1	39.9	4.0	35.9
	Allocated Central Support Group Costs:							
5	**Business Support & Reg'ty Affairs**	0.4	(0.2)	0.3	0.2	0.5	(0.1)	0.5
6	**Water Resources & Aboriginal Affairs**	0.7	(0.2)	0.5	0.2	0.8	(0.0)	0.8
7	**Dam Safety & Emergency Prep**	0.3	(0.1)	0.2	0.1	0.3	(0.0)	0.3
8	**Environment**	0.4	(0.1)	0.2	0.1	0.4	(0.0)	0.4
9	**Supply Chain**	0.4	(0.0)	0.3	0.0	0.4	(0.0)	0.4
10	**Hydroelectric Development**	0.3	(0.1)	0.3	(0.1)	0.1	(0.2)	0.3
11	**Engineering Services**	1.7	(0.2)	1.6	0.2	1.7	(0.2)	1.9
12	**EVP Office**	0.6	(0.5)	0.1	0.5	0.6	(0.5)	1.1
13	**Total Allocated Costs**	4.9	(1.5)	3.4	1.3	4.7	(1.1)	5.8
14	**Total**	40.1	(1.8)	38.2	6.4	44.6	2.9	41.7

Numbers may not add due to rounding.

Table 2b
Comparison of Base OM&A ($M)
Niagara Plant Group

Line No.	Group	2008 Actual	(c)-(a) Change	2009 Actual	(c)-(e) Change	2009 Budget
		(c)	(d)	(e)	(f)	(g)
	Niagara Plant Group:					
1	**Operations**	5.8	0.7	6.5	0.2	6.3
2	**Maintenance**	29.9	(2.4)	27.5	1.4	26.1
3	**Administration**	4.2	4.1	8.3	3.6	4.7
4	**Total Niagara Plant Group**	39.9	2.4	42.3	5.2	37.1
	Allocated Central Support Group Costs:					
5	**Business Support & Reg'ty Affairs**	0.5	(0.0)	0.4	(0.2)	0.6
6	**Water Resources & Aboriginal Affairs**	0.8	(0.0)	0.7	(0.1)	0.8
7	**Dam Safety & Emergency Prep**	0.3	0.0	0.3	0.0	0.3
8	**Environment**	0.4	(0.0)	0.3	(0.1)	0.4
9	**Supply Chain**	0.4	(0.0)	0.3	(0.1)	0.4
10	**Hydroelectric Development**	0.1	(0.0)	0.1	(0.3)	0.4
11	**Engineering Services**	1.7	0.2	2.0	(0.1)	2.1
12	**EVP Office**	0.6	(0.3)	0.2	(0.7)	0.9
13	**Total Allocated Costs**	4.7	(0.3)	4.4	(1.5)	5.9
14	**Total**	44.6	2.1	46.7	3.7	43.0

Numbers may not add due to rounding.

Table 2c
Comparison of Base OM&A ($M)
Niagara Plant Group

Line No.	Group	2009 Actual	(c)-(a) Change	2010 Budget	(e)-(c) Change	2011 Plan	(g)-(e) Change	2012 Plan
		(a)	(b)	(c)	(d)	(e)	(f)	(g)
	Plant Group:							
1	**Operations**	6.5	0.3	6.8	0.5	7.3	0.0	7.3
2	**Maintenance**	27.5	(0.3)	27.2	0.8	28.0	0.5	28.5
3	**Administration**	8.3	(2.0)	6.3	5.1	11.4	(6.9)	4.5
4	**Total Plant Group**	42.3	(2.0)	40.3	6.4	46.7	(6.4)	40.3
	Allocated Central Support Group Costs:							
5	**Business Support & Reg'ty Affairs**	0.4	0.1	0.5	0.0	0.5	(0.0)	0.5
6	**Water Resources & Aboriginal Affairs**	0.7	0.1	0.9	0.0	0.9	(0.0)	0.8
7	**Dam Safety & Emergency Prep**	0.3	0.0	0.4	0.0	0.4	(0.0)	0.4
8	**Environment**	0.3	0.0	0.3	0.0	0.4	0.0	0.4
9	**Supply Chain**	0.3	0.2	0.5	0.0	0.5	(0.1)	0.5
10	**Hydroelectric Development**	0.1	1.2	1.2	0.1	1.3	(0.8)	0.6
11	**Engineering Services**	2.0	0.7	2.7	(0.3)	2.4	0.1	2.5
12	**EVP Office**	0.2	0.2	0.4	0.0	0.4	(0.0)	0.4
13	**Total Allocated Costs**	4.4	2.5	6.9	(0.1)	6.8	(0.8)	6.0
14	**Total**	46.7	0.5	47.2	6.3	53.5	(7.2)	46.3

Numbers may not add due to rounding.

Table 3a
Comparison of Base OM&A ($M)
Saunders GS

Line No.	Group	2007 Budget	(c)-(a) Change	2007 Actual	(e)-(c) Change	2008 Actual	(e)-(g) Change	2008 Budget
		(a)	(b)	(c)	(d)	(e)	(f)	(g)
	Station:							
1	**Operations**	2.1	(0.1)	2.1	0.1	2.1	(0.1)	2.3
2	**Maintenance**	9.6	25.7	35.3	(30.5)	4.7	(4.7)	9.4
3	**Administration**	0.0	0.1	0.1	(0.1)	0.0	0.0	0.0
4	**Total Station**	11.7	25.7	37.4	(30.5)	6.9	(4.8)	11.7
	Allocated Plant Group Common Costs:							
5	**Plant Group Management**	0.2	(0.0)	0.2	(0.1)	0.2	0.0	0.2
6	**Business Support**	0.2	0.1	0.3	(0.1)	0.2	(0.0)	0.2
7	**HR Support Services**	0.4	(0.0)	0.3	0.0	0.4	0.0	0.3
8	**Asset Mgmt & Technical Support**[1]	0.6	(0.1)	0.4	(0.1)	0.3	(0.0)	0.4
9	**Total Plant Group Allocated Costs**	1.4	(0.1)	1.3	(0.3)	1.1	(0.0)	1.1
	Allocated Central Support Group Costs:							
10	**Business Support & Reg'ty Affairs**	0.2	0.0	0.2	(0.0)	0.1	(0.0)	0.2
11	**Water Resources & Aboriginal Affairs**	0.3	0.1	0.4	(0.1)	0.2	(0.0)	0.3
12	**Dam Safety & Emergency Prep**	0.1	0.0	0.1	(0.0)	0.1	(0.0)	0.1
13	**Environment**	0.1	0.0	0.2	(0.1)	0.1	(0.0)	0.1
14	**Supply Chain**	0.2	(0.0)	0.2	0.0	0.2	(0.0)	0.2
15	**Hydroelectric Development**	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16	**Engineering Services**	0.5	0.0	0.5	0.0	0.5	0.0	0.5
17	**EVP Office**	0.2	(0.2)	0.0	0.1	0.2	(0.2)	0.4
18	**Total Allocated Central Support Costs**	1.5	0.1	1.5	(0.1)	1.4	(0.2)	1.7
19	**Total**	14.6	25.7	40.3	(30.9)	9.4	(5.0)	14.4

Notes:
1 2007 Project Management Costs have been included with Asset Management.

Numbers may not add due to rounding.

Table 3b
Comparison of Base OM&A ($M)
Saunders GS

Line No.	Group	2008 Actual	(c)-(a) Change	2009 Actual	(c)-(e) Change	2009 Budget
		(a)	(b)	(c)	(d)	(e)
	Station:					
1	**Operations**	2.1	0.2	2.3	(0.1)	2.4
2	**Maintenance**	4.7	5.2	9.9	0.3	9.6
3	**Administration**	0.0	0.0	0.0	0.0	0.0
4	**Total Station**	6.9	5.4	12.2	0.2	12.0
	Allocated Plant Group Common Costs:					
5	**Plant Group Management**	0.2	0.0	0.2	0.0	0.2
6	**Business Support**	0.2	(0.1)	0.1	(0.1)	0.2
7	**HR Support Services**	0.4	0.1	0.4	0.1	0.3
8	**Asset Mgmt & Technical Support**	0.3	0.1	0.4	0.0	0.4
9	**Total Plant Group Allocated Costs**	1.1	0.1	1.1	0.0	1.1
	Allocated Central Support Group Costs:					
10	**Business Support & Reg'ty Affairs**	0.1	(0.0)	0.1	(0.1)	0.2
11	**Water Resources & Aboriginal Affairs**	0.2	(0.0)	0.2	(0.0)	0.3
12	**Dam Safety & Emergency Prep**	0.1	0.0	0.1	0.0	0.1
13	**Environment**	0.1	(0.0)	0.1	(0.0)	0.1
14	**Supply Chain**	0.2	(0.0)	0.2	(0.0)	0.2
15	**Hydroelectric Development**	0.0	0.0	0.0	0.0	0.0
16	**Engineering Services**	0.5	0.1	0.7	0.1	0.5
17	**EVP Office**	0.2	(0.1)	0.1	(0.2)	0.3
18	**Total Allocated Central Support Costs**	1.4	0.0	1.5	(0.2)	1.7
19	**Total**	9.4	5.5	14.8	0.0	14.8

Numbers may not add due to rounding.

Table 3c
Comparison of Base OM&A ($M)
Saunders GS

Line No.	Group	2009 Actual	(c)-(a) Change	2010 Budget	(e)-(c) Change	2011 Plan	(g)-(e) Change	2012 Plan
		(a)	(b)	(c)	(d)	(e)	(f)	(g)
	Station:							
1	**Operations**	2.3	(0.1)	2.2	0.2	2.4	0.1	2.5
2	**Maintenance**	9.9	(0.6)	9.3	0.4	9.7	0.4	10.1
3	**Administration**	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	**Total Station**	12.2	(0.7)	11.5	0.6	12.1	0.5	12.6
	Allocated Plant Group Common Costs:							
5	**Plant Group Management**	0.2	0.0	0.2	(0.0)	0.2	0.0	0.2
6	**Business Support**	0.1	0.0	0.1	0.0	0.1	0.0	0.1
7	**HR Support Services**	0.4	(0.3)	0.1	0.0	0.2	0.0	0.2
8	**Asset Mgmt & Technical Support**	0.4	0.2	0.7	0.0	0.7	0.0	0.7
9	**Total Plant Group Allocated Costs**	1.1	(0.0)	1.1	0.0	1.2	0.0	1.2
	Allocated Central Support Group Costs:							
10	**Business Support & Reg'ty Affairs**	0.1	0.1	0.2	0.0	0.2	0.0	0.2
11	**Water Resources & Aboriginal Affairs**	0.2	0.1	0.3	0.0	0.3	0.0	0.3
12	**Dam Safety & Emergency Prep**	0.1	0.0	0.1	0.0	0.1	0.0	0.1
13	**Environment**	0.1	0.0	0.1	0.0	0.1	0.0	0.2
14	**Supply Chain**	0.2	0.0	0.2	0.0	0.2	0.0	0.2
15	**Hydroelectric Development**	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16	**Engineering Services**	0.7	0.2	0.9	(0.1)	0.8	0.0	0.8
17	**EVP Office**	0.1	0.1	0.1	0.0	0.2	0.0	0.2
18	**Total Allocated Central Support Costs**	1.5	0.5	2.0	(0.1)	1.9	0.1	2.0
19	**Total**	14.8	(0.2)	14.6	0.6	15.2	0.6	15.8

PROJECT OM&A – REGULATED HYDROELECTRIC

1.0 PURPOSE

This evidence provides a summary of the OM&A project expenses for the regulated hydroelectric facilities.

2.0 OVERVIEW

The regulated hydroelectric project OM&A expense for 2007 - 2012 is provided in Ex. F1-T3-S1 Table 1. The test period project OM&A expenses of $9.7M and $10.0M (in 2011 and 2012, respectively) form part of the OM&A expense in the revenue requirement.

OPG's OM&A projects differ from base OM&A work because they have a non-recurring scope of work, a generally longer timeline and a higher materiality threshold. In contrast, base OM&A work activities are typically of an ongoing or routine nature. OM&A projects are distinct from capital projects because they do not meet the criteria for capitalization under OPG's capitalization policy (see Ex. A2-T2-S1). Hydroelectric plant groups manage both capital and OM&A projects (including those for the regulated facilities) in a project listing that forms the basis for budgeting during the annual business planning process. Projects are identified through routine inspections, engineering reviews and detailed plant condition assessments. The process for identifying and prioritizing hydroelectric projects is described in Ex. F1-T1-S1.

OM&A projects are mainly sustaining expenditures for repairs and maintenance, such as major unit overhauls. The costs are above a materiality threshold (typically $50k), but do not meet the rules for capitalization. In addition to maintenance projects for production equipment, there are many projects related to aging civil structures. Project OM&A expenditures on production equipment include the unit rehabilitation program at Sir Adam Beck Pump Generating Station, which is expected to start in 2011. This project is estimated at $15M, of which $3.3M is planned to be spent in 2011 and 2012. Major OM&A projects are listed in Ex. F1-T3-S3.

The management of regulated hydroelectric OM&A projects is identical to that of capital projects as described in Ex. D1-T1-S1.

Numbers may not add due to rounding.

Table 1
Project OM&A - Regulated Hydroelectric ($M)

Line No.	Prescribed Facility	2007 Actual	2008 Actual	2009 Actual	2010 Budget	2011 Plan	2012 Plan
		(a)	(b)	(c)	(d)	(e)	(f)
1	**Niagara Plant Group**	6.5	10.4	8.0	4.0	6.7	6.0
2	**Saunders GS**	0.4	4.2	1.1	1.2	3.0	4.0
3	**Total**	7.0	14.6	9.1	5.3	9.7	10.0

COMPARISON OF PROJECT OM&A - REGULATED HYDROELECTRIC

1.0 PURPOSE

This evidence presents period-over-period comparisons of project OM&A for the regulated hydroelectric facilities.

2.0 PERIOD-OVER-PERIOD CHANGES

Year-over-year variances are presented by plant group in Ex. F1-T3-S2 Table 1 and by project category in Ex. F1-T3-S2 Table 2 and are explained here.

3.0 PERIOD-OVER-PERIOD CHANGES – TEST PERIOD

2012 Plan versus 2011 Plan

From 2011 to 2012, overall regulated hydroelectric OM&A project expenditures are expected to increase by $0.3M to a total of $10.0M. Of the total, Niagara Plant Group project expenditures are expected to decrease by $0.7M to $6.0M. This decrease is due to the completion of: the overhaul of Unit G8 at DeCew Falls I, repairs to the Elevator number 1 shaft at Sir Adam Beck I, concrete restoration of the Sir Adam Beck I screenhouse, and a number of other small projects. The decreases are offset by increased costs related to the major unit overhaul project at Sir Adam Beck Pump Generating Station ("PGS"). At R.H. Saunders, project expenditures are $1.0M more in 2012 than 2011. The increase is due to the project to remove existing lead-based paint and apply corrosion protection on the Barnhardt Island Bridge in 2012 at an estimated net cost of $3.4M. This is a Joint Works project with New York Power Authority ("NYPA") and is regulatory (contractual) in nature. The increase related to the Barnhardt Island Bridge is offset by the completion in 2011 of the Ice Sluice Deck Support Beam Rehabilitation project at a planned cost of $2.0M.

Expenditures, when viewed by project category, show an increase in regulatory (contractual) projects due to the Barnhardt Island Bridge project planned for 2012, while sustaining projects decrease as a number of sustaining repair projects are completed in 2011.

2011 Plan versus 2010 Budget

From 2010 to 2011, overall regulated hydroelectric OM&A project expenditures are expected to increase by $4.4M to a total plan of $9.7M. This is comprised of an increase in Niagara Plant Group project expenditures of $2.7M and an increase of $1.7M at R.H. Saunders. Niagara Plant Group's total increase results from planned rehabilitation work at DeCew Falls I Unit G8, the repairs to the Sir Adam Beck I elevator number 1 shaft, concrete restoration of the Sir Adam Beck I screenhouse, and the start of the Sir Adam Beck PGS major unit rehabilitation program. R.H. Saunders planned increase of $1.7M covers a number of small civil and mechanical repair projects. The largest project planned for 2011 is the $2.0M Ice Sluice Deck Support Beam Rehabilitation mentioned above.

Expenditures by project category show only a small increase in regulatory projects. The increase in sustaining projects is due to the repair projects described above.

4.0 PERIOD-OVER-PERIOD CHANGES – BRIDGE YEAR

2010 Budget versus 2009 Actual

From 2009 to 2010, overall regulated hydroelectric OM&A project expenditures are expected to decrease by $3.8M to a total expenditure level of $5.3M. Niagara Plant Group OM&A project expenditures are expected to decrease from $8.0M to $4.0M in 2010. The significant drop in budgeted project costs for the Niagara Plant Group is due to the completion of a number of projects including the DeCew Falls 1 G6 turbine and generator overhaul, several large concrete repairs at Sir Adam Beck I and II, powerhouse crane repairs at Sir Adam Beck II, and the completion of the Unit PG6 overhaul and dyke repairs at Sir Adam Beck PGS. R.H. Saunders' project OM&A expenditures are relatively unchanged at $1.1M in 2009 versus the 2010 budget of $1.2M.

Consistent with overall level of OM&A project spending, the expenditures by project category show decreases for both sustaining and regulatory projects in 2010 versus 2009. Regulatory projects are expected to decrease due to the completion of a number of small safety and environmental projects in 2009. Sustaining projects are expected to decrease due to the completion of the Niagara Plant Group projects described above.

5.0 PERIOD-OVER-PERIOD CHANGES – HISTORICAL PERIOD

2009 Actual versus 2009 Budget

For 2009, overall regulated hydroelectric OM&A project expenditures were $9.1M or $3.0M below budget. For the Niagara Plant Group, OM&A project costs were $2.3M below budget. The variance was mainly due to the deferral of the Sir Adam Beck I powerhouse roof replacement ($2.4M), offset by increased expenditures on other projects such as the Unit PG6 overhaul and dyke repairs at Sir Adam Beck PGS. The 2009 actual project OM&A expenses for R.H. Saunders were $0.7M lower than budget mainly due to lower than planned expenditures on Joint Works projects controlled by the New York Power Authority ("NYPA"), and the deferral of the cleaning of the R.H. Saunders' main dam foundation drainage system. This project was deemed to be unnecessary at his time, as investigation work found the drains to be performing satisfactorily from a dam safety perspective.

For expenditures by project category, regulatory projects were $6.4M below budget while sustaining projects were $3.4M above budget for 2009. Regulatory projects were below budget due to the lower than planned expenditures on Joint Works projects at R.H. Saunders, the deferral or cancellation of a number of bridge projects in the Niagara Plant Group, and the deferral of canal erosion protection projects at DeCew Falls. The deferral of regulatory projects allowed for increased spending on sustaining projects, specifically the Unit PG6 overhaul and dyke repairs at Sir Adam Beck PGS, and additional spending on concrete repairs at Sir Adam Beck I.

2009 Actual versus 2008 Actual

From 2008 to 2009, overall regulated hydroelectric OM&A project expenditures decreased by $5.5M, from $14.6M to $9.1M. Niagara Plant Group OM&A project spending in 2009 was $2.4M lower than 2008 actual spending of $10.4M. Decreased spending at Niagara Plant Group was a result of the completion of Unit PG6 overhaul at the Sir Adam Beck PGS. OM&A project spending at R.H. Saunders was $3.0M lower in 2009 than in 2008 ($1.1M versus $4.2M). 2008 saw the completion of several regulatory and civil projects, the largest being the Eel Ladder Extension and Improvement project, and the rehabilitation of the access road and parking areas around the facility.

Consistent with the overall level of OM&A project spending, the expenditures by project category show decreases for both sustaining and regulatory projects in 2009 versus 2008. Regulatory projects decrease slightly due to the completion of the eel ladder at R.H. Saunders in 2008. Sustaining projects decrease due to the completion of Niagara Plant Group projects described above.

2008 Actual versus 2008 Budget

For 2008, overall regulated hydroelectric OM&A project expenditures were $14.6M or $1.7M higher than budget. Niagara Plant Group OM&A project spending in 2008 was $0.4M below budget. There was $3.2M in unexpected spending for a unit overhaul required at Sir Adam Beck PGS following the failure of seals in the Unit PG6 turbine runner resulting in oil leaks. This large unbudgeted repair and $0.6M in discovery work on Sir Adam Beck II powerhouse crane project required reduced expenditures and the deferral of other projects in order to maintain 2008 project spending within the approved budget for the Niagara Plant Group. The remaining $0.4M variance is a result of unused contingencies on completed projects. R.H. Saunders' OM&A project spending in 2008 was $2.1M higher than budget as a result of the Eel Ladder Extension and Improvement project that was unplanned. The eel ladder had to be improved to bring the station into full regulatory compliance with the Ontario Endangered Species Act. Higher than originally planned contractor costs for several smaller projects also contributed to higher project spending at R.H Saunders.

For expenditures by project category, regulatory projects were $3.2M below budget while sustaining projects were $4.9M above budget for 2008. Regulatory projects were below budget due to the deferral or cancellation of a number of bridge repair projects in the Niagara Plant Group, offset by higher than planned spending on the Eel Ladder Extension and Improvement project at R.H. Saunders. Sustaining projects were above budget due to the unplanned expenditures described above, in particular, the Unit PG6 overhaul and dyke repairs at Sir Adam Beck PGS.

2008 Actual versus 2007 Actual

From 2007 to 2008, overall regulated hydroelectric OM&A project expenditures increased by $7.6M (from $7.0M to $14.6M). This is comprised of an increase in project expenditures of $3.9M in the Niagara Plant Group and an increase of $3.7M at R.H. Saunders. The Niagara Plant Group's total increase results from $2.1M in underspent projects in 2007 combined with new projects identified above, offset by the deferral or cancellation of a number of bridge repairs (which will now be replaced or divested) and other projects. R.H. Saunders' OM&A increased by $3.7M due to the addition of the unplanned Eel Ladder Extension and Improvement project and a number of other smaller civil and mechanical repair projects. These include: $0.7M for the rehabilitation of the access road and parking areas around the facility, $0.3M to complete the elevator rehabilitation project which was deferred from 2007 as discussed below, and several Joint Works projects controlled by NYPA.

For expenditures by project category, the increase in regulatory projects is mainly due to the addition of the eel ladder project and Joint Works projects at R.H. Saunders. The increase in sustaining projects is due to the addition of overhauls at DeCew Falls I Unit G8 and the Sir Adam Beck PGS Unit PG6, and the addition of several civil repair projects, offset by the completion of the major overhauls of the turbine-generators at DeCew Falls II in 2007.

2007 Actual versus 2007 Budget

For 2007, overall regulated hydroelectric OM&A project expenditures were $2.9M below budget. Niagara Plant Group expenditures were approximately $2.1M under budget. The reduced expenditures were a result of deferring the DeCew Falls G6 and G8 overhaul projects totalling $1.1M, the delayed execution of the DeCew Falls' headworks road repairs project totalling $0.7M, and $0.4M underspent on the Sir Adam Beck I screenhouse wall repairs resulting from delays due to weather conditions.

R.H. Saunders' OM&A project expenses in 2007 were $0.4M which was approximately $0.7M below the budget of $1.2M. This lower than planned spending was the result of reclassifying two projects to capital after determining that replacement was more cost effective than repair and upgrade ($0.3M) and deferring two projects into 2008 to allow for

better execution of the HVAC replacement project and the Station Service Water Replacement project. Deferred projects were the elevator rehabilitation ($0.3M) and the repair of dam safety instrumentation ($0.2M).

Numbers may not add due to rounding.

Table 1
Comparison of Project OM&A - Regulated Hydroelectric ($M)

Line No.	Prescribed Facility	2007 Budget	(c)-(a) Change	2007 Actual	(e)-(c) Change	2008 Actual	(e)-(g) Change	2008 Budget
		(a)	(b)	(c)	(d)	(e)	(f)	(g)
1	**Niagara Plant Group**	8.7	(2.1)	6.5	3.9	10.4	(0.4)	10.8
2	**Saunders GS**	1.2	(0.7)	0.4	3.7	4.2	2.1	2.1
3	**Total**	9.9	(2.9)	7.0	7.6	14.6	1.7	12.9

Line No.	Prescribed Facility	2008 Actual	(c)-(a) Change	2009 Actual	(c)-(e) Change	2009 Budget
		(a)	(b)	(c)	(d)	(e)
4	**Niagara Plant Group**	10.4	(2.4)	8.0	(2.3)	10.3
5	**Saunders GS**	4.2	(3.0)	1.1	(0.7)	1.8
6	**Total**	14.6	(5.5)	9.1	(3.0)	12.1

Line No.	Prescribed Facility	2009 Actual	(c)-(a) Change	2010 Budget	(e)-(c) Change	2011 Plan	(g)-(e) Change	2012 Plan
		(a)	(b)	(c)	(d)	(e)	(f)	(g)
7	**Niagara Plant Group**	8.0	(4.0)	4.0	2.7	6.7	(0.7)	6.0
8	**Saunders GS**	1.1	0.1	1.2	1.7	3.0	1.0	4.0
9	**Total**	9.1	(3.8)	5.3	4.4	9.7	0.3	10.0

Numbers may not add due to rounding.

Table 2
Comparison of Project OM&A by Category - Regulated Hydroelectric ($M)

Line No.	OM&A Project Category	2007 Budget	(c)-(a) Change	2007 Actual	(e)-(c) Change	2008 Actual	(e)-(g) Change	2008 Budget
		(a)	(b)	(c)	(d)	(e)	(f)	(g)
1	**Regulatory**	1.0	(0.6)	0.4	2.3	2.6	(3.2)	5.8
2	**Sustaining**	8.9	(2.3)	6.6	5.3	11.9	4.9	7.0
3	**Value Enhancing/Strategic**	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	**Total**	9.9	(2.9)	7.0	7.6	14.6	1.7	12.9

Line No.	OM&A Project Category	2008 Actual	(c)-(a) Change	2009 Actual	(c)-(e) Change	2009 Budget
		(a)	(b)	(c)	(d)	(e)
5	**Regulatory**	2.6	(1.0)	1.7	(6.4)	8.1
6	**Sustaining**	11.9	(4.5)	7.4	3.4	4.0
7	**Value Enhancing/Strategic**	0.0	0.0	0.0	0.0	0.0
8	**Total**	14.6	(5.5)	9.1	(3.0)	12.1

Line No.	OM&A Project Category	2009 Actual	(c)-(a) Change	2010 Budget	(e)-(c) Change	2011 Plan	(g)-(e) Change	2012 Plan
		(a)	(b)	(c)	(d)	(e)	(f)	(g)
9	**Regulatory**	1.7	(0.5)	1.2	0.1	1.3	2.4	3.7
10	**Sustaining**	7.4	(3.3)	4.1	4.3	8.4	(2.1)	6.3
11	**Value Enhancing/Strategic**	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	**Total**	9.1	(3.8)	5.3	4.4	9.7	0.3	10.0

DETAILS OF OM&A PROJECTS – REGULATED HYDROELECTRIC

1.0 PURPOSE

This evidence provides a project listing and business case summaries for OM&A project expenditures for the regulated hydroelectric facilities during the test period.

2.0 OVERVIEW

A tiered reporting structure for OM&A projects has been used:

- Tier 1: For projects with a total cost of $10M or greater and which have budgeted expenditures during the test period, business case summaries are provided if available.
- Tier 2: All projects with a total cost of $5M to $10M are individually listed, with the project name, description and project cost information provided.
- Tier 3: An aggregated total of the budgeted expense for all projects with a total cost of $0 to $5M is provided.

Based on the tiered reporting structure, there is one regulated hydroelectric project that falls into Tier 1 (Ex. F1-T3-S3 Table 1), and none that falls into Tier 2 (Ex. F1-T3-S3 Table 2). Tier 3 projects are shown in Ex. F1-T3-S3 Table 3.

2.1 New Projects without a Business Case Summary

The one regulated hydroelectric project greater than $10M is not released and therefore does not have a Business Case Summary. This project is described below. Other project information including in-service dates and test period costs are shown in Ex. F1-T3-S3 Table 1.

2.1.1 Sir Adam Beck Pump Generating Station - Units 1 to 5 Overhauls (SABP0036)

The scope of this project is to overhaul the Pump Generating Station (“PGS”) units 1 to 5. The project is currently in the identification phase.

The units at the PGS employ very complicated Dariaz runners. This runner design uses an internal servomotor arrangement to adjust turbine blade pitch to optimize operating efficiency through a wide range of head heights and generator loadings. In addition, the blade pitch can be adjusted so that the unit functions efficiently as a pump.

A unit overhaul program at the PGS was last completed in the mid to late 1990s. There was an expectation, at that time, that after completing these overhauls the runner life at these units would be 25 to 30 years. This period is consistent with the life expectancies of the Francis type runners at OPG's other generating stations and was consistent with the previous unit's service life at the PGS. However, since the unit overhauls were completed, the number of start-stop and pump-generating cycles that the PGS units have experienced has increased significantly. The number of cycles is expected to further increase in response to changes in the Ontario generation mix and electricity system operation.

In 2008, the seals on the unit PG6 runner failed after approximately ten years of service necessitating an emergency unit overhaul (Ex. F1-T1-S1, section 4.1). Based on a careful inspection of the condition of the PG6 runner internal mechanisms, OPG has concluded that 15 years is a more reasonable service life expectation, given the complicated nature of the runner and the expected number of start-stop and pump-generation cycles. In addition, inspection of the runner blades indicated that there is significant blade deformation that is a result of cavitation repairs conducted in the past. Correcting the blade deformation of the remaining units will increase unit efficiency and energy production.

Unit overhauls will begin with units PG1 and PG3 as these units were the first to be overhauled in the 1990's and currently have the greatest risk of failure. The results from the inspection of runner internal mechanisms during these overhauls will be used to confirm the 15 year life expectancy of these runners and to justify the overhauls on units PG2, PG4 and PG5. The first unit overhaul (PG1) is planned for 2012. The remaining four unit overhauls are planned for after the test period.

Numbers may not add due to rounding.

Table 1
OM&A Project Listing - Regulated Hydroelectric
Projects >$10M Total Project Cost[1]

Line No.	Project Name	Project Summary Ref. No.	Category	Start Date	In-Service Date	Total Project Cost ($M)	2007 Actual ($M)	2008 Actual ($M)	2009 Actual ($M)	2010 Budget ($M)	2011 Plan ($M)	2012 Plan ($M)
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)
	Project summaries for the following projects are included in this section of the application											
	Niagara Plant Group											
1	Sir Adam Beck Pump GS - Units 1-5 Overhauls	SABP0036	Sustaining	2011	2016	15.0	0.0	0.0	0.0	0.0	0.4	2.9
	Saunders GS											
2	No projects in this category					0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	**Total**					15.0	0.0	0.0	0.0	0.0	0.4	2.9

Notes:
1 Projects with expenditures during Test Period.

Numbers may not add due to rounding.

Table 2
OM&A Project Listing - Regulated Hydroelectric
Projects $5M - $10M Total Project Cost[1]

Line No.	Project Name	Category	Project Description	Total Project Cost ($M)
	(a)	(b)	(c)	(d)
	Niagara Plant Group			
1	No projects in this category			0.0
	Saunders GS			
2	No projects in this category			0.0
3	**Total**			0.0

Notes:
1 Projects with expenditures during Test Period.

Numbers may not add due to rounding.

Table 3
OM&A Project Listing - Regulated Hydroelectric
Projects <$5M Total Project Cost[1]

Line No.	Project Description	Number of Projects	Total Project Cost ($M)	Average Cost Of All Projects ($M)
		(a)	(b)	(c)
	Niagara Plant Group			
1	**Aggregate Total All Projects <$5M**	14	15.4	1.1
	Saunders GS			
2	**Aggregate Total All Projects <$5M**	15	12.9	0.9
3	**Total**	29.0	28.3	1.0

Notes:
1 Projects with expenditures during Test Period.

GROSS REVENUE CHARGE – REGULATED HYDROELECTRIC

1.0 PURPOSE

This evidence describes the gross revenue charges ("GRC") that OPG, as a hydroelectric generator, is required to pay pursuant to legislative and regulatory requirements.

2.0 OVERVIEW

The forecast GRC for the regulated hydroelectric facilities is $257.1M and $252.2M in 2011 and 2012 respectively and forms part of the test period revenue requirement. Ex.. F1-T4-S1, Table 1 presents the GRC for the years 2007 - 2012. Section 3.0 below describes what the GRC is, sets out its statutory authority and sets out how the amounts payable are calculated.

3.0 GROSS REVENUE CHARGE ON HYDROELECTRIC GENERATING STATIONS

The GRC refers to the taxes and charges that, as of January 2001, are required to be paid by owners of hydroelectric generating stations under section 92.1 of the *Electricity Act, 1998*. The GRC consists of two components:

- A property tax component payable to the Minister of Finance or the OEFC.
- A water rental component payable to the Minister of Finance by all holders of water power leases.

All aspects of GRC payments made by OPG to the Province are governed by legislation or regulation. As such, OPG does not control the GRC charges associated with its regulated hydroelectric facilities.

Each of OPG's six regulated hydroelectric stations is subject to the GRC property tax component. Four of the regulated hydroelectric stations, Sir Adam Beck I, Sir Adam Beck II, Sir Adam Beck Pump Generating Station ("PGS") and R.H. Saunders, are subject to water rental charges. Since the land and reservoirs associated with operation of the DeCew Falls stations are not subject to water power leases, the DeCew Falls stations are not subject to

the GRC water rental component charge. However, water conveyance charges are paid to the St. Lawrence Seaway Management Corporation per the terms of lease agreements with the St. Lawrence Seaway Management Corporation and as described in greater detail later in this section.

O. Reg. 124/02 (amended by O. Reg. 9/10, filed January 20, 2010) under the *Electricity Act, 1998* defines the methodology for calculating the GRC. The GRC is determined by multiplying the station's annual generation by a deemed price of $40/MWh and by the appropriate GRC rate (described below).

O. Reg. 124/02 also defines how a station's annual generation is determined for purposes of calculating GRC. A station's "annual generation for a year is the amount of electricity generated by the station during the year, other than electricity that is consumed directly in the generation of electricity at the station without being conveyed through a transmission or distribution system". O. Reg. 124/02 also prescribes the methodology for determining a station's annual generation when that station has used water associated with another station or has allowed another station to use the water normally associated with it (see Ex. G1-T1-S1 for a discussion of Water Transactions).

The GRC property tax component charge consists of graduated tax rates through four tiers of production and applies to each of the six regulated hydroelectric generating stations. The GRC property tax component charge is assessed at 2.5 per cent on gross revenue from the first 50 GWh of annual generation from the generating station, at 4.5 per cent on gross revenue from the next 350 GWh (from 50 to 400 GWh), at 6 per cent on gross revenue from the next 300 GWh (from 400 to 700 GWh), and at 26.5 per cent on gross revenue from annual generation in excess of 700 GWh.

The GRC water rental component charge is assessed at the fixed rate of 9.5 per cent on the gross revenue calculated from annual generation determined for each of Sir Adam Beck I, Sir Adam Beck II, Sir Adam Beck PGS, and R.H. Saunders.

Rates applicable to the GRC property and water rental components are summarized in the following chart:

Chart 1
Gross Revenue Charge Components

Station Production (GWh/yr)	Water Rental Rate (%)	Property Graduated Rate (%)	Total GRC Rate (%)
0 – 50	9.5	2.5	12.0
50 – 400	9.5	4.5	14.0
400 – 700	9.5	6.0	15.5
> 700	9.5	26.5	36.0

The GRC property tax component charges applicable to the regulated hydroelectric stations are payable to the OEFC. Under section 3(1) of the *Assessment Act* (Ontario), land, buildings and structures used in connection with a hydroelectric generating station are exempt from taxation under the *Assessment Act* (Ontario), including those held by OPG. However, property tax on land and buildings not used in connection with the hydroelectric generating stations is paid by OPG under the provisions of the *Assessment Act* (Ontario).

The GRC water rental component charges applicable to the four regulated hydroelectric sites, which are operated under water power leases (Sir Adam Beck I, Sir Adam Beck II, Sir Adam Beck PGS, and R.H. Saunders), are payable to the Ontario Minister of Finance, with the exception of a portion of the GRC water rental component payable with respect to the Sir Adam Beck Complex which is payable to the Niagara Parks Commission as required by O. Reg. 135/02 under the *Electricity Act, 1998.*

O. Reg. 124/02 also provides for a deduction in the calculation of gross revenue. Eligible capacity associated with new, redeveloped, or upgraded hydroelectric generating stations may be able to claim a deduction as described in O. Reg. 124/02, resulting in lower GRC charges.

As previously identified, the land and reservoirs associated with the operation of the DeCew plants are not held pursuant to water power leases. They are therefore not subject to the GRC water rental component charge. However, charges are incurred by OPG under an agreement with the St. Lawrence Seaway Management Corporation. Water used for power generation at the DeCew plants is withdrawn from the Welland Ship Canal at Allanburg. OPG compensates the St. Lawrence Seaway Management Corporation for conveying water from Lake Erie through the St. Lawrence Seaway Management Corporation's canal to the Allanburg intakes. A Supplemental Agreement to the lease went into effect July 1, 2008. Under the terms of the Supplemental Agreement, water conveyance charges are determined based on the actual monthly average DeCew diversion flow. St. Lawrence Seaway Management Corporation water conveyance charges are expected to range between $5M to $6M annually in 2011 and 2012. The St. Lawrence Seaway Management Corporation costs have been included with the Niagara Plant Group's GRC totals in Ex. F1-T4-S1 Table 1.

Numbers may not add due to rounding.

Table 1
Gross Revenue Charge - Regulated Hydroelectric ($M)

Line No.	Prescribed Facility	2007 Actual[1]	2008 Actual	2009 Actual	2010 Budget	2011 Plan	2012 Plan
		(a)	(b)	(c)	(d)	(e)	(f)
1	**Niagara Plant Group**	151.6	159.0	163.2	163.5	162.6	157.9
2	**Saunders GS**	90.2	94.5	96.4	93.7	94.5	94.3
3	**Total**	241.8	253.5	259.6	257.2	257.1	252.2
4	**NYPA Water Transactions[2]**	1.6	1.4	2.4	6.0	5.5	5.0

Notes:

1 "2007 final" Actuals differ slightly from the "2007 preliminary" Actuals presented previously as Prefiled Evidence in EB-2007-0905.

2 GRC amounts associated with NYPA Water Transactions are not included in the totals presented above.

COMPARISON OF GROSS REVENUE CHARGE – REGULATED HYDROELECTRIC

1.0 PURPOSE

This evidence presents period-over-period comparisons of the gross revenue charge ("GRC") for the regulated hydroelectric facilities for 2007 - 2012.

2.0 OVERVIEW

This evidence supports the approvals sought for the GRC. O. Reg. 124/02 (amended by O. Reg. 9/10, filed January 20, 2010) prescribes that the fixed price of $40/MWh is to be used for determining GRC for the regulated hydroelectric facilities. This price was in place throughout the historical period (2007 - 2009) and is expected to continue unchanged in the bridge year and test period (2010 - 2012). Exhibit F1-T4-S2 Table 1 sets out the comparison of the GRC by plant group for 2007 - 2012. The St. Lawrence Seaway Management Corporation lease costs, pertaining to DeCew water conveyance charges, have been included in the Niagara Plant Group's GRC totals.

3.0 PERIOD-OVER-PERIOD CHANGES – TEST PERIOD

2012 Plan versus 2011 Plan

The year-over-year change in GRC is due solely to changes in the production forecasts. The regulated hydroelectric production is expected to decrease from 19.4 TWh in 2011 to 19.0 TWh in 2012 (see Ex. E1-T1-S2), resulting in a decrease in the GRC from $257.1M to $252.2M.

2011 Plan versus 2010 Budget

The year-over-year change in GRC is due solely to changes in the production forecasts. The regulated hydroelectric production is forecast to be similar for 2010 and 2011, projected at 19.3 TWh and 19.4 TWh, respectively (see Ex. E1-T1-S2). GRC is estimated to be just over $257.0M for the two years.

4.0 PERIOD-OVER-PERIOD CHANGES – BRIDGE YEAR

2010 Budget versus 2009 Actual

The difference in GRC between 2009 and 2010 is due solely to year-over-year changes in production. The production forecast for 2010 (19.3 TWh) is projected to be slightly lower than the actual 2009 production of 19.4 TWh (see Ex. E1-T1-S2). GRC is expected to decrease accordingly, from $259.6M in 2009 to $257.2M in 2010.

5.0 PERIOD-OVER-PERIOD CHANGES – HISTORICAL PERIOD

2009 Actual versus 2009 Budget

The difference in GRC between the 2009 budget and the 2009 actual is due solely to differences between forecast and actual production. The production plan for 2009 was 18.5 TWh versus actual production of 19.4 TWh (see Ex. E1-T1-S2). This difference resulted in an increase in the GRC from $244.1M (budgeted) to $259.6M (actual).

2009 Actual versus 2008 Actual

The difference in GRC between 2008 and 2009 is due solely to year-over-year changes in production. Actual production increased from 19.0 TWh in 2008 to 19.4 TWh in 2009 (see Ex. E1-T1-S2). This resulted in a GRC increase from $253.5M in 2008 to $259.6M in 2009.

2008 Actual versus 2008 Budget

The change in GRC is due solely to changes between budgeted and actual 2008 production. The budgeted production for 2008 was 17.4 TWh versus actual production of 19.0 TWh (see Ex. E1-T1-S2). This difference resulted in an increase in the GRC from $228.2M (budgeted) to $253.5M (actual).

2008 Actual versus 2007 Actual

The difference in GRC between 2007 and 2008 is due solely to year-over-year changes in production. Actual production increased from 18.2 TWh in 2007 to 19.0 TWh in 2008 (see Ex. E1-T1-S2). This resulted in a GRC increase from $241.8M in 2007 to $253.5M in 2008.

2007 Actual versus 2007 Budget

The difference in GRC for 2007 between budgeted and actual is due solely to differences in forecast and actual production. The production budget for 2007 was 17.5 TWh versus actual production of 18.2 TWh (see Ex. E1-T1-S2). This difference resulted in an increase in the GRC from $228.9M (budgeted) to $241.8M (actual).

Numbers may not add due to rounding.

Table 1
Comparison of Gross Revenue Charge - Regulated Hydroelectric ($M)

Line No.	Prescribed Facility	2007 Budget	(c)-(a) Change	2007 Actual[1]	(e)-(c) Change	2008 Actual	(e)-(g) Change	2008 Budget
		(a)	(b)	(c)	(d)	(e)	(f)	(g)
1	**Niagara Plant Group**	143.0	8.6	151.6	7.4	159.0	14.2	144.9
2	**Saunders GS**	85.9	4.3	90.2	4.2	94.5	11.1	83.4
3	**Total**	228.9	12.9	241.8	11.7	253.5	25.3	228.2
4	**NYPA Water Transactions[2]**	1.0	0.6	1.6	(0.2)	1.4	0.9	0.4

Line No.	Prescribed Facility	2008 Actual	(c)-(a) Change	2009 Actual	(c)-(e) Change	2009 Budget
		(a)	(b)	(c)	(d)	(e)
5	**Niagara Plant Group**	159.0	4.2	163.2	7.1	156.2
6	**Saunders GS**	94.5	1.9	96.4	8.5	87.9
7	**Total**	253.5	6.1	259.6	15.5	244.1
8	**NYPA Water Transactions[2]**	1.4	1.0	2.4	0.9	1.4

Line No.	Prescribed Facility	2009 Actual	(c)-(a) Change	2010 Budget	(e)-(c) Change	2011 Plan	(g)-(e) Change	2012 Plan
		(a)	(b)	(c)	(d)	(e)	(f)	(g)
9	**Niagara Plant Group**	163.2	0.2	163.5	(0.9)	162.6	(4.7)	157.9
10	**Saunders GS**	96.4	(2.6)	93.7	0.7	94.5	(0.1)	94.3
11	**Total**	259.6	(2.4)	257.2	(0.1)	257.1	(4.9)	252.2
12	**NYPA Water Transactions[2]**	2.4	3.6	6.0	(0.5)	5.5	(0.5)	5.0

Notes:
1 "2007 final" Actuals differ slightly from the "2007 preliminary" Actuals presented previously as Prefiled Evidence in EB-2007-0905.
2 GRC amounts associated with NYPA Water Transactions are not included in the totals presented above.

OM&A PURCHASED SERVICES – REGULATED HYDROELECTRIC

1.0 PURPOSE

This evidence presents the purchases of OM&A services and products for the regulated hydroelectric facilities that meet the threshold of 1 per cent of total OM&A expense before taxes consistent with the OEB's filing guidelines.

2.0 OVERVIEW

An overview of OPG's procurement process is presented in Ex. F3-T3-S1.

The regulated hydroelectric OM&A expense before taxes is equal to the sum of the regulated hydroelectric base OM&A plus project OM&A expense. This amount ranges from $67.1M in 2010 to a high of $85.6M in 2007 as presented in Ex. F1-T1-S1 Table 1. For the regulated hydroelectric facilities the threshold of 1 per cent of the OM&A expense before taxes is approximately $500k.

Information on vendor contracts for OM&A purchased services within the regulated hydroelectric business that are equal to or in excess of the $500k threshold for any of the years 2007, 2008 and 2009 is presented in Chart 1.

Chart 1
Purchase of Services – Regulated Hydroelectric OM&A Contracts

Vendor Name	Description/Nature of Activities	Tendering Process		Rationale if Single Source
		Competitive	Single Source	
Aecon Industrial	Wide range of construction activity at Niagara plant group, including paving, roof repair, and removal of surplus equipment.	✓		
Charles Jones Industrial Limited	Supply of tools and shop equipment.	✓		
Comstock Canada	Wide range of construction activities at Niagara plant group, including, transformer removal, drain work, cliff stabilization, road repair and widening, fore bay cleanout, tailrace deck repair, screenhouse wall repair, and gantry crane work.	✓		
E.S. Fox	Wide range of construction activities at Niagara plant group, including refurbishment of stop logs and gates, electrical upgrades, parking lot work, and refurbishment of washrooms	✓		
Kinectrics	Concrete work at Niagara and a dam safety investigation at Saunders.	✓	✓ at R.H. Saunders	For the R.H. Saunders dam safety investigation, Kinectrics was the only supplier with the skills and expertise to drill into the dam substrate and analyze the conditions.

Total 2007 Spend ($M) = 5.0
Total 2008 Spend ($M) = 2.3
Total 2009 Spend ($M) = 2.4