



Hydro Thermal Operations 2013-15 Business Plan

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Hydro Thermal Operations Strategies & Key Deliverables

1. Operate and Maintain Hydro & Thermal Plants with Focus on Sustaining & Regulatory Work

- Safe and reliable plant operations through prudent maintenance and investment strategy with significant deferral/reductions of value enhancing and low risk work. Utilize a risk-based approach (ie, Plant Condition/Engineering Risk Assessments) for determining investment priorities
 - Continue to strengthen and develop relationships with stakeholders to sustain continued operations at existing HTO facilities and [REDACTED]
 - Maintain/improve excellent safety, environmental and reliability performance. Continue prudent investments and improvements in Dam and Public Safety program
 - [REDACTED]
- commitments are met and value to OPG is maximized

2. Transform Hydro Thermal Operations into a Low Cost, Agile and Variable Business Model

- Complete implementation of BTS centre-led model, reductions, and initiatives
- Transition the business to a more flexible and cost variable model
- [REDACTED]
- Prepare OEB 2014/15 Cost of Service filing and Niagara Tunnel Prudency Review. Prepare for and implement Incentive Regulation as per OEB appropriate schedule
- Implement/operationalize Information Management Transformation project (SAP to Passport/Asset Suite)

Hydro Thermal Operations Strategies & Key Deliverables (Cont'd)

3. Optimize Costs & Project Timing - Move Hydro Value Enhancing/Capacity Projects to Post 2016 Period and [REDACTED]

- Total plan over plan OM&A cost reduction of [REDACTED] ([REDACTED] in 2012, [REDACTED] in 2013 and [REDACTED] in 2014) achieved through:
 - [REDACTED] and deferral of lowest risk major overhaul and civil maintenance projects in the Hydro fleet ([REDACTED])
 - Absorption of labour escalation ([REDACTED]) through productivity improvements and work program reductions and optimization
 - Reductions in non-base labour and other costs of approximately [REDACTED] per year (eg, Society PSA reductions associated with reduced project portfolio, overtime savings on outages, non-essential travel reductions)
- Total plan over plan capital cost reduction of [REDACTED] during 2012 to 2014 period. HTO will execute the planned capital project portfolio for existing assets on budget and schedule (average [REDACTED] per year)

4. Grow the Business

- Provide Project Management support to ensure projects are safely delivered on time, budget and scope
- Support Corporate Business Development in new generation opportunities ([REDACTED] [REDACTED] Ranney Falls, [REDACTED])
- [REDACTED]

Planning Assumptions (2013 to 2015)

Hydro

- Focus on regulatory and sustaining work during planning period. Value enhancing projects (runner upgrades) deferred to post 2015 period
- Hydro major unit refurbishment and outage program aligned with Darlington refurbishment timing. Non-system impactful outages deferred to post 2016 period
- PGS Reservoir rehabilitation and full station outage deferred from 2014 to 2016/17 to mitigate Surplus Baseload Generation (SBG) spill losses
- Niagara Tunnel in-service mid-2013 (6 months early) and cost of \$1.5B versus budget of \$1.6B

Thermal

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General

- HTO staff dedicated to the implementation of the IMT project funded by BAS (Capital – Execution Phase)
- Development projects entering Execution Phase in 2013 are included in the HTO Business Plan. Hydro Development/repowering projects in definition and concept phase, [REDACTED], are included in the Corporate Business Development plan
- Aboriginal past grievance provision/contingency will be funded by Stakeholder Relations (\$5 M per yr)

Hydro Thermal Operations Performance Summary

	2012 Actual	2013	2014	2015
<u>PRODUCTION</u>				
Capacity (MW)	[REDACTED]			
Hydro	6,996	6,996	7,063	7,433
Thermal	[REDACTED]			
Energy (TWh)	[REDACTED]			
Hydro	[REDACTED]			
Thermal	[REDACTED]			
Hydro Availability (%)	91.2	91.6	92.6	91.2
Thermal Start Guarantee (%)	[REDACTED]			
EFOR (OP) (%)	[REDACTED]			
<u>RESOURCES</u>				
Total OM&A (\$M)	[REDACTED]			
Base OM&A (\$M)	[REDACTED]			
Project OM&A (\$M)	[REDACTED]			
Total Capital (\$M)	[REDACTED]			
[REDACTED]	[REDACTED]			
Niagara Tunnel (\$M)	231	184	0	0
[REDACTED]	[REDACTED]			
Regular Staff	[REDACTED]			

Hydro Thermal Operations OM&A Plan over Plan

OM&A (\$M)	<u>2012</u> <u>Actual</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>
Approved 2012 OM&A Business Plan				
Business Transformation - Phase 1 Transfers to Corporate Groups Corporate Labour Escalation Challenge (PWU, Society, & Management) Labour Rate & Burden Changes (2013-2015)				
Revised 2013 OM&A Guideline				
<div style="background-color: black; width: 500px; height: 80px; margin-bottom: 10px;"></div> Non-Standard Projects Changes Schedule Change (deferred, cancelled or advanced) Scope Change Cost Change (escalation and revised estimates) New Project (from Plant Conditon Assessments) Other				
2013 OM&A Submission				
2013 OM&A Submission versus Revised 2013 OM&A Guideline				

Hydro Thermal Operations Capital Plan over Plan

CAPITAL (\$M)	<u>2012</u> <u>Actual</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>
Approved 2012 Capital Business Plan				
Business Transformation - Phase 1 Transfers to Corporate Groups				
Revised 2012 Capital Business Plan				
<u>Operations Projects Changes</u>				
Schedule Change (deferred, cancelled or advanced)				
Scope Changes				
Cost Changes (escalation and revised estimates)				
New Project (from Plant Condition Assessment)				
Other				
<u>Destiny Project Changes</u>				
Niagara Tunnel Project	8	5	-32	0
Total 2013 Capital Submission				
2013 Capital Submission versus Revised 2012 Capital BP				

Hydro Development / Thermal Repowering Projects

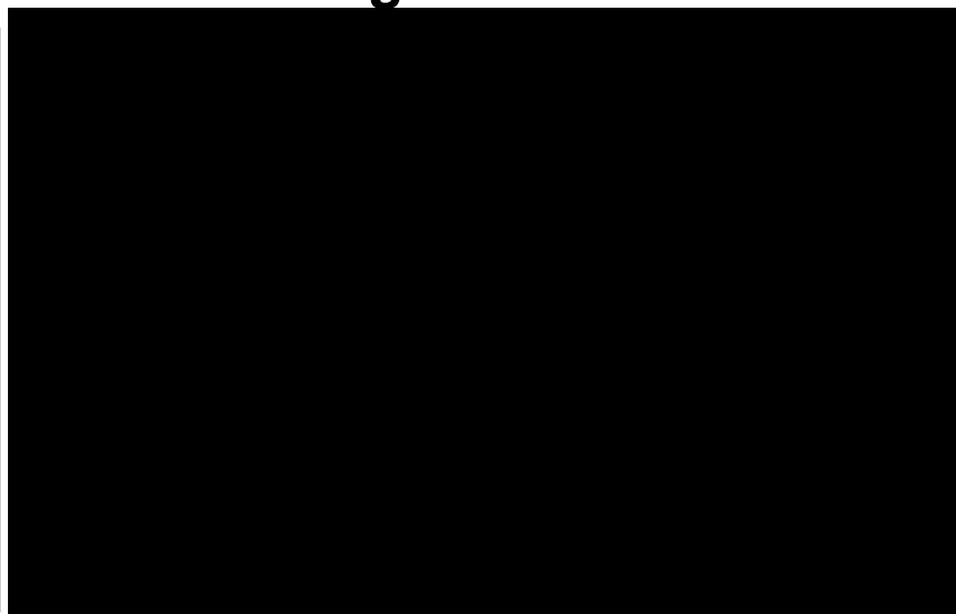
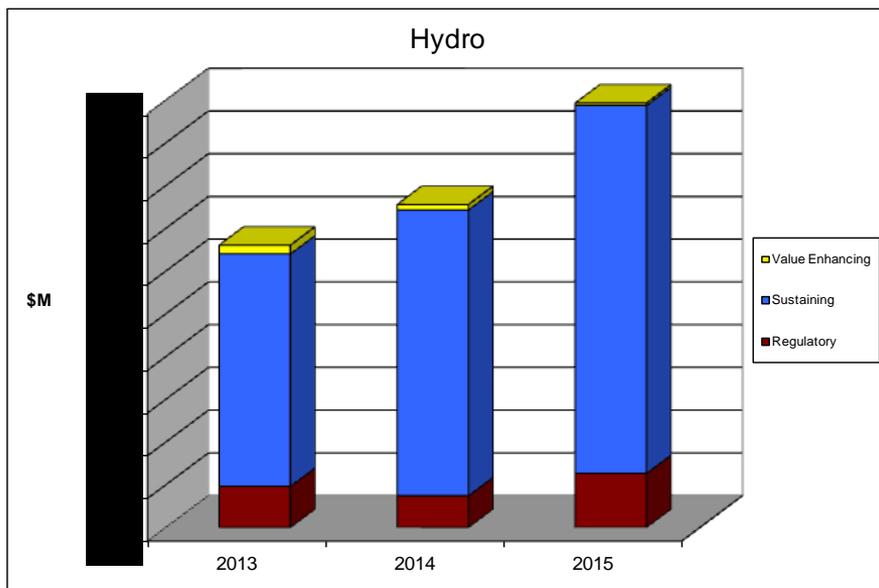
Base Case	Capacity	LUEC	2012 LTD	2013	2014	2015	2016	2017	Future costs	Total
	MW	cents/kWh	\$M	\$M	\$M	\$M	\$M	\$M	\$M	\$M
Projects In Execution (HTO)										
Niagara Tunnel Project	n/a	6.8	1,316	184						1,500
Total HTO										

Base Case	Capacity	LUEC	2012 LTD	2013	2014	2015	2016	2017	2018	Total
	MW	cents/kWh	\$M	\$M	\$M	\$M	\$M	\$M	\$M	\$M
Projects In Definition Phase (CBD)										
Ranney Falls	9	10 to 12	1	3	19	19	1			42
SAB PGS Reservoir Rehabilitation	n/a	n/a	7	3	0	0	176	176		362
Total CBD (Definition Phase)										

* Projects in Definition Phase are included and funded in the Corporate Business Development (CBD) Business Plan

- Projects in execution phase included in the HTO Business Plan. Projects in Definition Phase (except Thunder Bay GS) included and funded in the Corporate Business Development (CBD) Business Plan
- Projects in Definition Phase, including [REDACTED], Ranney Falls and SAB PGS Reservoir Rehabilitation, will be transferred to HTO after execution phase releases are approved
- [REDACTED]
- High Planning Scenario projects including [REDACTED] and Lake Gibson are included in the Corporate Business Development Business Plan

Project Expenditures on Existing Assets



- Continued re-investment for the long term safety and sustainment of the existing assets includes project expenditures averaging [REDACTED] per year (Capital [REDACTED] & OM&A [REDACTED])
- Determination of investment levels and priorities are based on Plant Condition/Engineering Risk Assessments and inspections/testing, and consider station/fleet age , type of equipment, station role (peaking vs base), reliability targets, contract commitments [REDACTED], and business objectives and risks
- Hydro re-investment levels of ~1% of the “replacement cost” (excluding new facilities) are based on good practice
- Major Hydro investments during planning period include:
 - replacement of ageing “power train components” such as turbines, generators, transformers
 - repairs, rehabilitation or replacement of ageing civil structures including powerhouses, penstocks, dams, sluiceways and bridges
 - replacement or refurbishment of sluiceways & stoplogs (regulatory/safety) and headgates
 - replacement of control equipment (automation) to improve efficiency and accommodate market dispatch requirements

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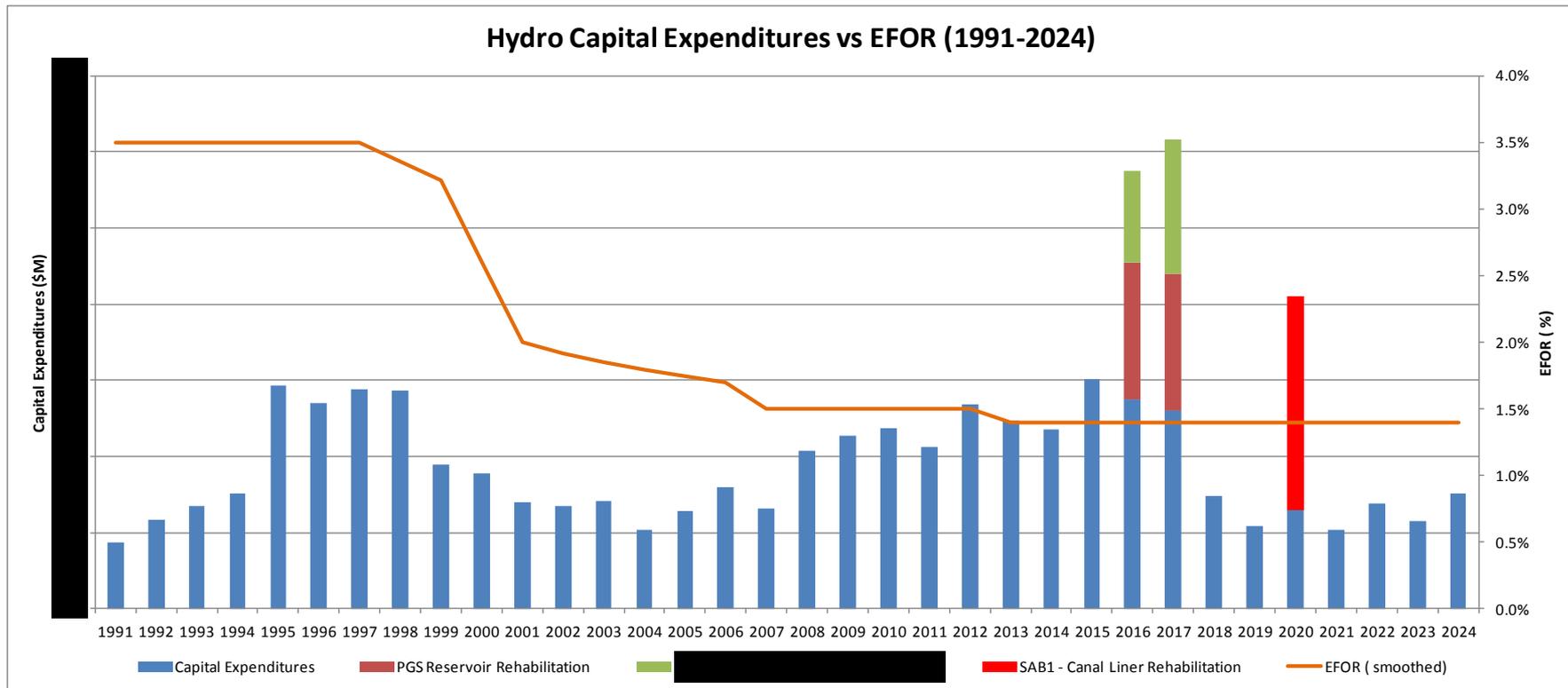


Hydro Thermal Operations Existing Fleet Project Portfolio Plan over Plan

	2012	2013	2014
2012-2014 BP			
Hydro Capital and OM&A Project Investments (M\$)			
Thermal Capital and OM&A Project Investments (M\$)			
2012-2014 BP Total Hydro + Thermal Investment			
2013-2015 BP			
Hydro Capital and OM&A Project Investments (M\$)			
Thermal Capital and OM&A Project Investments (M\$)			
2013-2015 BP Total Hydro + Thermal Investment			
Total HTO Project Portfolio Plan Over Plan Change			

- In the 2012-2014 period, the HTO operations project portfolio (Capital and OM&A Non Standard projects) [REDACTED] by a total of [REDACTED] [REDACTED] and [REDACTED] of Hydro value-enhancing projects

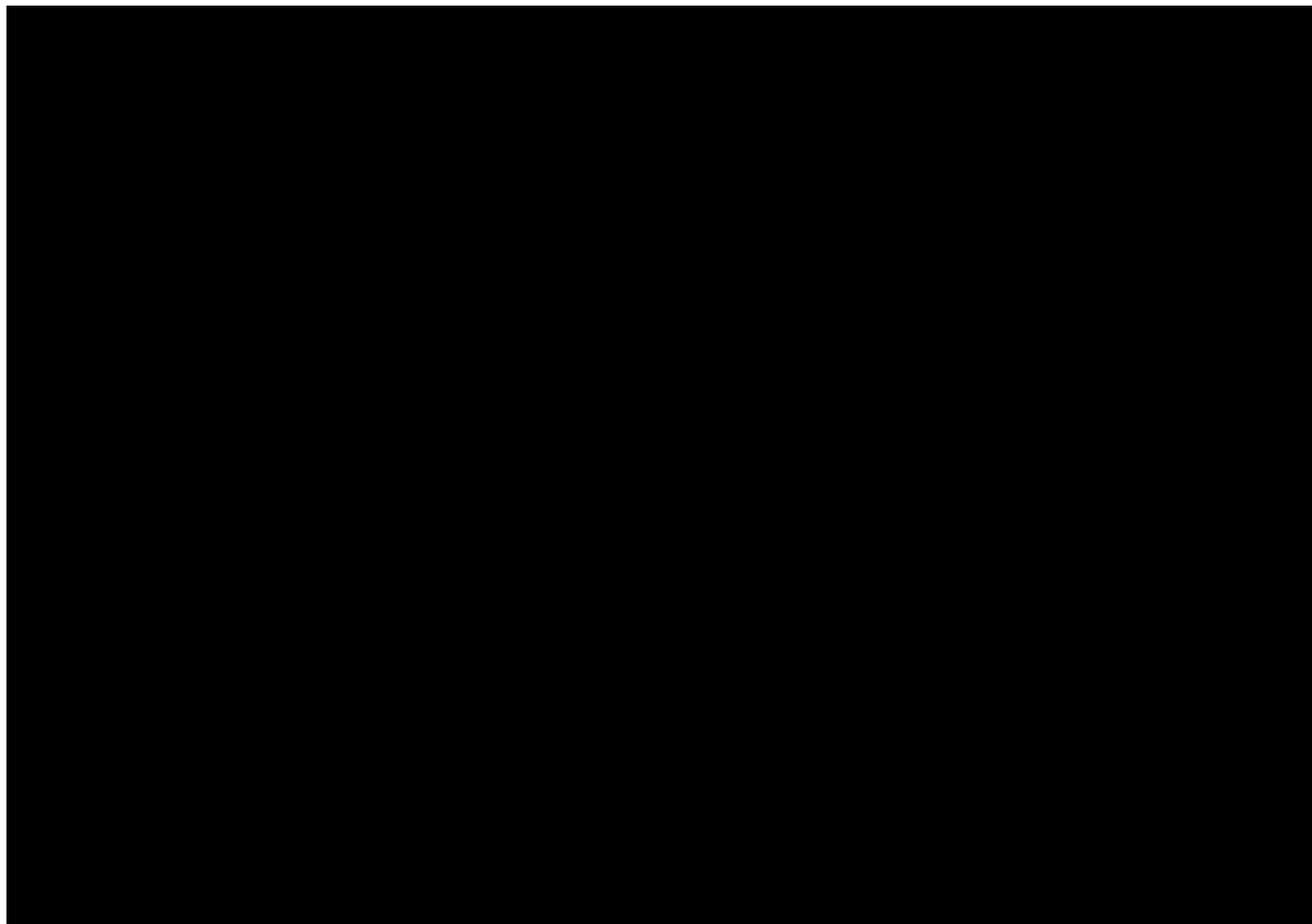
Historical Hydro Capital vs EFOR



- From 1990 to 2003, large Hydro stations primarily built before 1958 were rehabilitated (eg, Saunders, SAB 2, Otto Holden, and Chenux)
- From 2006 to 2020, remaining large stations have been, or will be rehabilitated (eg, Abitibi Canyon, Des Joachims, Decew Falls, Stewartville, Mountain Chute)
- In addition, large civil projects (PGS Reservoir liner rehabilitation, [redacted] and SAB 1 canal rehabilitation) are planned
- The investment program, along with the Leading Edge Maintenance Program, has resulted in significant reliability (EFOR) improvements.

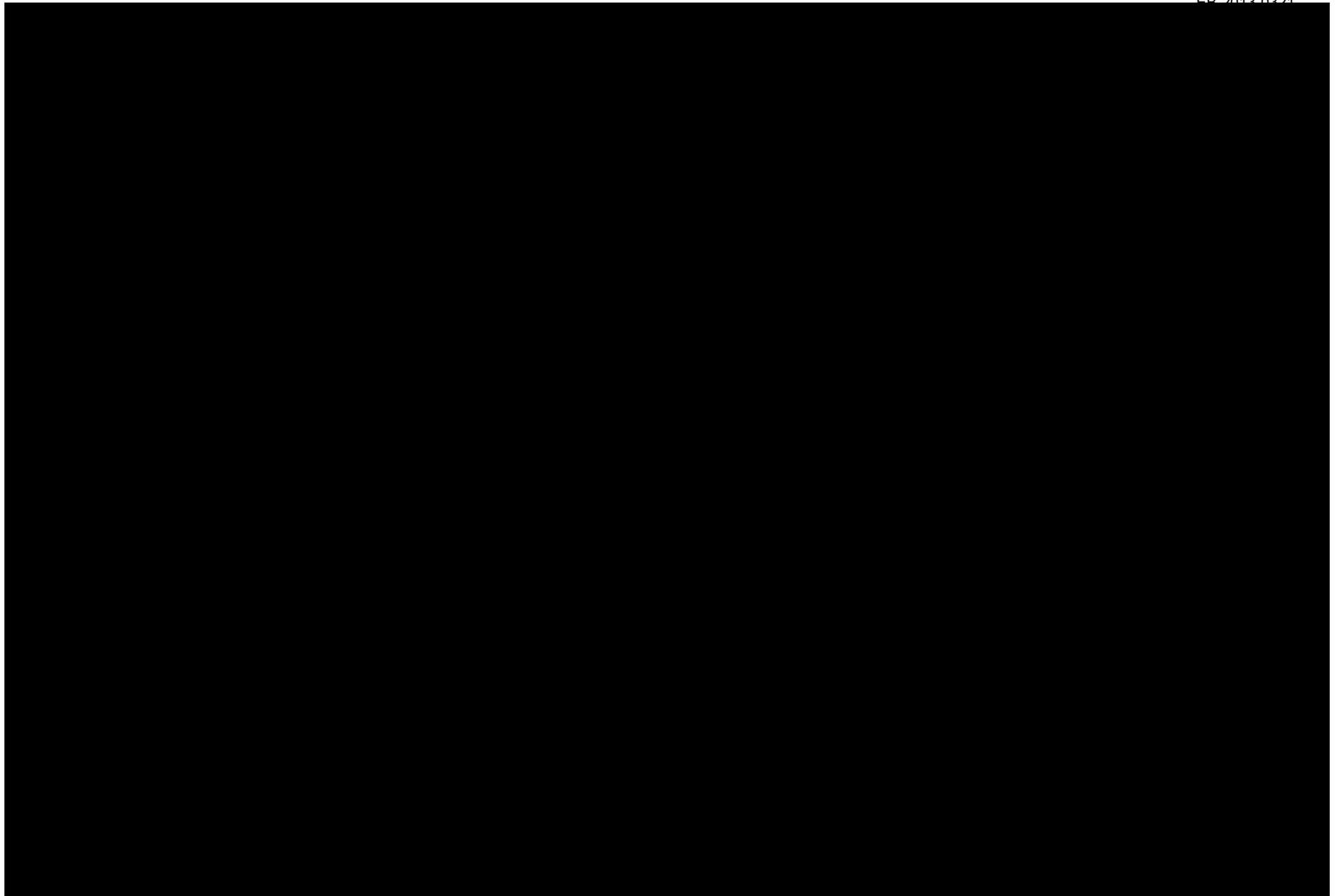
Note: Capital Costs in \$ of the year

Hydro Thermal Operations Staff Plan & Strategy



- HTO expected to achieve overall BTS end state staff numbers in 2015
- Overall HTO attrition rates favourable, however, mismatches in retirement vs ongoing skill requirements will necessitate replacements in critical areas (eg operators)





Key Business Risks

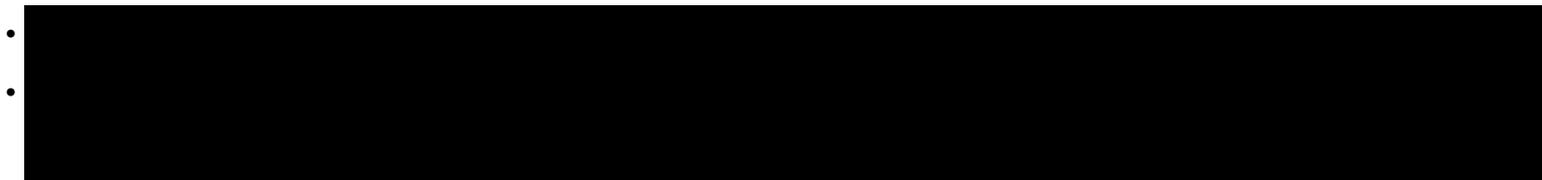
		Risk Ranking
1		
2		
3	Aboriginal: Increasing complexity of role and potential cost increases for unsettled past grievances	Medium
4	Uncertainty of full cost recovery for Hydro Regulated Assets and Niagara Tunnel Project	Medium
5	Implementation costs of new Provincial Dam Safety technical guidelines. Overall cost risk has been reduced compared to previously proposed MNR guidelines last year. Site specific impacts need to be assessed and could result in additional capital costs not included in plan (\$100M to \$400M)	Medium
6	Environmental risks associated with Ontario Endangered Species Act and Federal Species at Risk Act (compliance may require physical improvement costs and/or impacts on production/revenue) (\$100M)	Medium
7	Increased cost and delayed completion of destiny projects (NTP – Low; [REDACTED])	Low
8	Increased costs due to new Heritage Act (\$30M)	Low
9	New requirements for Permits to Take Water	Low
10	Uncertainty with future reliability of Hydro and Thermal plants associated with changing operating modes (eg, more stops and starts and gate operations due to SBG mitigation and wind integration)	Low
11	Structural and other operational risks associated with AAR induced concrete growth at Otto Holden and Saunders, ageing penstocks, and ageing bridges in Niagara	Low
12	Underestimating Future Cost Escalation for Major Equipment and Civil Construction	Low
13	Uncertainty with successful implementation of IMT Project and adequacy of Passport/Asset Suite	Low

Looking To The Future - Opportunities

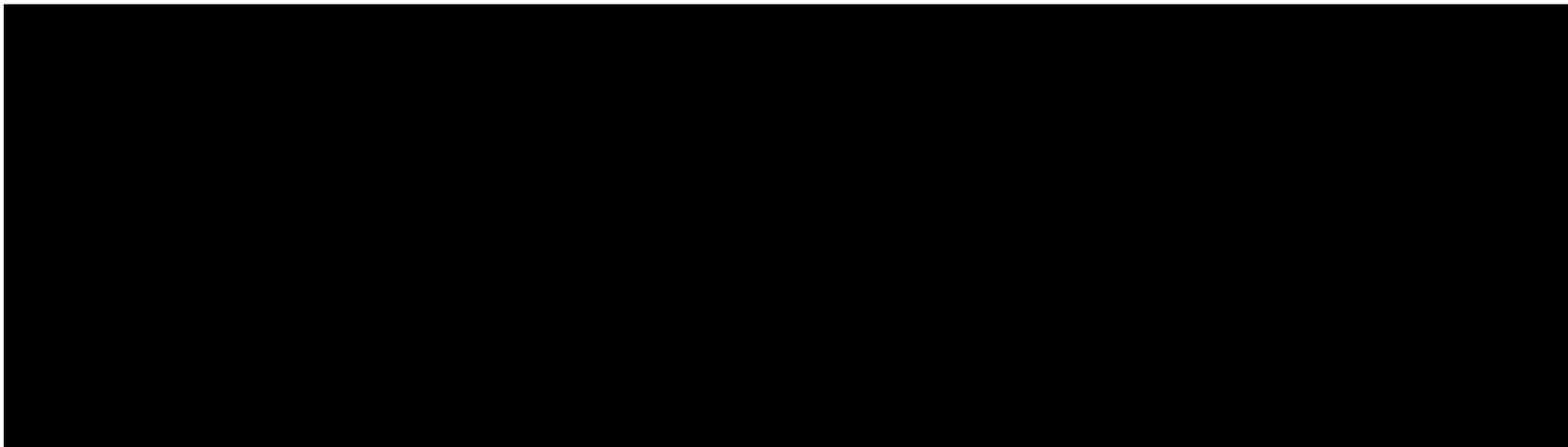
The following opportunities and strategies will be reviewed by HTO during the 2013-2015 BP Period

1. Transition the business to a more cost variable model

- Optimization of Hydro overhaul and major maintenance resourcing strategy



2.



3.

4.

5. Investment Strategy aligned with regulated,  requirements



Appendices

Hydro Asset Profile

STATIONS PROFILE



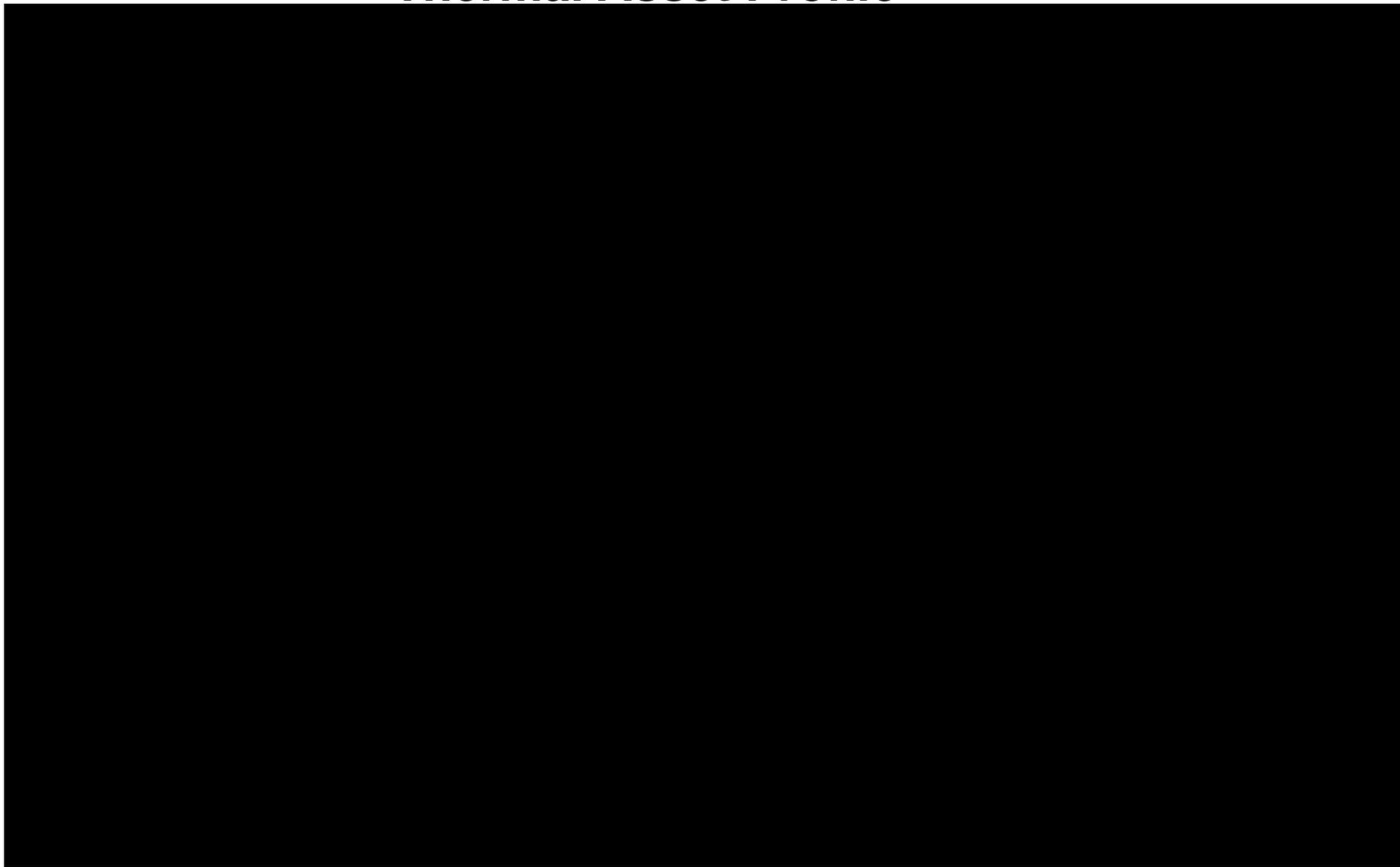
NO. OF STATIONS	65
AVERAGE ENERGY	34.3 TWh/yr
CAPACITY	6996 MW
AVERAGE AGE	71 yrs
NO. OF GENERATING UNITS	234
SMALLEST / LARGEST UNIT	1 MW / 137 MW
NO. OF DAMS	232
BOOK VALUE OF ASSETS	~\$7.1 B

PEOPLE / WORK CENTRES / LAND

PLANT GROUPS	5
WORK CENTRES	22
CONTROL CENTRES (includes International Control Dam Control Centre)	7
TOTAL STAFF (PG only)	~980 (2012 Plan)
OPERATORS	~105
NO. OF RIVER SYSTEMS	24
HYDRO OWNED LAND	~17,000 hectares
LEASED LAND (flooded)	~800, 000 hectares



Thermal Asset Profile



HTO Reliability Performance

	2012 Budget	2012 YE Actuals	2013	2014	2015
Hydro					
Availability	91.2%	91.2%	91.6%	92.6%	91.2%
Scheduled Outage Factor	7.4%	7.4%	7.3%	6.3%	7.7%
EFOR	1.4%	2.0%	1.4%	1.4%	1.4%
Spill Losses (Forced + Planned Outages) (GWh)	220	198	366	384	368
Thermal					
Start Guarantee					
CAWN					
Maintenance Outage Factor (%)					
EFOR(OP)					

Runner Replacement /Upgrade Program

2013-2015 BP Runner Upgrades	Completed 1992 to 2011	2012 Actual	2013	2014	2015	2013-2015 BP Total	2016	2017	2018	2019	2020	Total (2013 to 2020)
CAPACITY (MW)	464	[REDACTED]										
ENERGY (GWh)	885	[REDACTED]										
TOTAL CAPITAL COST (M\$)	243	[REDACTED]										
OM&A COST (M\$)	23	[REDACTED]										

- All runner replacements that were in the plan, solely to enhance value (not sustaining), have been deferred to the 2016 to 2020 period (eg Otter Rapids)
- During the Business Plan period, HTO capacity and energy are expected to [REDACTED] respectively, as a result of runner upgrades. This is a [REDACTED] compared to last year's plan
- From 1992 to 2012, HTO will have realized an increase in capacity of 464 MW and 885 GWh, as a result of the runner upgrade program