Regulated Hydroelectric Operations

OPG Regulated Facilities
Payment Amounts

Stakeholder Meeting #1
March 29, 2010

Mario Mazza
Director, Business Support & Regulatory Affairs
Hydro
Outline

- Regulated Hydroelectric – Base OM&A costs
- Regulated Hydroelectric – Project OM&A costs
- Regulated Hydroelectric – Gross Revenue Charge
- Summary of Costs
- Factors That Affect Water Supply For Regulated Hydroelectric Energy Production
- Historical Energy Production
- Regulation of Water Rights
- Energy Forecasting Methodology Overview
- Energy Production Forecast Values
Base OM&A costs include routine day-to-day operations and maintenance-related activities in support of Production, along with associated administration and Hydroelectric Central Support costs.

Niagara Plant Group costs include allocations from Hydroelectric Central Support, and R.H. Saunders costs include allocations from both Ottawa St. Lawrence Plant Group and Hydroelectric Central Support.

Productivity improvements have been incorporated in operating and maintenance practices (e.g., Streamlined Reliability Centered Maintenance, skills broadening, consolidation of control rooms and overtime management).
Base OM&A – Activities

**Plant Group**

**Operations (O)**
- Control room operators
- Water management activities (e.g., dam operations, flow monitoring, ice boom installation / removal and ice breaking)

**Maintenance (M)**
- Preventative (reliability centred maintenance)
- Corrective (to address breakdowns)
- Emergent (condition based, resulting from inspections)
- Regulatory (health and safety, dam and public safety and environment)
- Contractual obligations (e.g., Joint Works with NYPA)

**Administration (A)**
- Plant Group common support costs including Plant Group manager, asset management, local technical support, project management, and business services

**Hydroelectric Central Support**
Hydroelectric Central Support provides common or specialized services to all of OPG’s plant groups (e.g., engineering). Hydroelectric Central Support costs are either directly assigned or allocated to the regulated hydroelectric stations by using base OM&A and or capital.
## Base OM&A - Summary

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<td>5.8</td>
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<td>8.7</td>
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<td><strong>Total Base OM&amp;A</strong></td>
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<td><strong>53.9</strong></td>
<td><strong>61.5</strong></td>
<td><strong>61.8</strong></td>
<td><strong>68.7</strong></td>
<td><strong>62.2</strong></td>
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OM&A projects have clearly defined scope of work and timeline (non-routine work)
- OM&A projects are distinct from capital projects (do not meet the criteria for capitalization)
- Project management methodology is the same as for capital projects
- OM&A projects typically fall into two categories:
  - Maintenance of production equipment (e.g., major unit overhauls)
  - Repairs to civil works (e.g., repairs to bridges, dams, and powerhouses)

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<td>Total Project OM&amp;A</td>
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### Capital Expenditures Summary

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<td><strong>Total Capital</strong></td>
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<td><strong>160.1</strong></td>
<td><strong>251.0</strong></td>
<td><strong>295.3</strong></td>
<td><strong>328.0</strong></td>
<td><strong>235.8</strong></td>
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Gross Revenue Charge (GRC)

- GRC payments are set by regulation made under the *Electricity Act, 1998*.
- GRC consists of two components applied to station energy production:
  - Water Rentals (fixed rate of 9.5%)
  - Property Tax (graduated rates, which increase with increasing production)
- The deemed price is $40/MWh.
- Payments to the St. Lawrence Seaway Management Corporation for the DeCew Falls stations have been included with Niagara Plant Group’s GRC.

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<td>Total</td>
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<td>259.6</td>
<td>257.2</td>
<td>257.1</td>
<td>252.2</td>
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Regulated Hydroelectric OM&A Costs

![Bar Chart: Regulated Hydroelectric OM&A Costs]

- **2007 Actual**: $250 - $300
- **2008 Actual**: $250 - $300
- **2009 Actual**: $250 - $300
- **2010 Budget**: $250 - $300
- **2011 Plan**: $250 - $300
- **2012 Plan**: $250 - $300

- **GRC**
- **Base OM&A**
- **Project OM&A**

Regulated Facilities Payment Amounts
Factors that Affect Water Supply for Energy Production

- Inflow from upstream sources (Upper Great Lakes)
- Local basin supply:
  - Precipitation
  - Evaporation
  - Runoff Coefficients (ground absorption)
- Weed Effects/Retardation
- Ice effects (partial blockages at intakes and area of river)
Historical energy production has varied significantly during past 30 years. There could be significant swings of over 1.5 TWh from one year to the next. Production forecast variability is highly dependant on Mother Nature.
Niagara Diversion Treaty (Canada & USA):
- Main objective of treaty is to protect scenic beauty of Falls
- Falls Flow requirement is first priority. Remaining flow is for power generation
- OPG and NYPA share the water available for generation equally, excluding the Long Lac/Ogoki diversion water, which is solely used by OPG at Niagara
- Continues in perpetuity, but terminable by either party on 12 months prior written notice

Sir Adam Beck GS 1 & 2

- Uses water from the Niagara River conveyed via two tunnels, and water from the Niagara/Welland Rivers diverted through an open cut canal

DeCew Falls Diversion:

- Uses water from Lake Erie, conveyed through the Welland Canal by the St. Lawrence Seaway Management Corporation (navigational needs have priority)

St. Lawrence – R.H. Saunders

- Water levels and river operations are governed by the International St. Lawrence River Board of Control (ISLRBC)
Energy Forecasting – General Methodology

Forecast methodology is essentially the same as last rate application.

Step 1:

Forecast Water Levels and Flows

- **Short Term:**
  Using hydrological models developed by government agencies, water levels and flows are forecast for the local basins associated with the regulated hydroelectric assets (short term forecast).

- **Long Term:**
  For periods beyond two years, the flow trends back towards monthly historic median values.
Step 2:

**Forecast Energy Using Water Levels / Flows and OPG Energy Models**

- OPG energy forecast models use the water flow forecast and apply generating unit physical characteristics units, energy efficiency ratings (kW/cms) and availability information (planned outages) to determine forecast energy production.

- During 2009, Surplus Baseload Generation (SBG) was more prevalent in Ontario due to reduced electricity demand. Significant SBG is forecast to continue through the test period. Consequently, an SBG adjustment has been integrated into the production forecast.
## Energy Production Forecast Values

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<td>12.3</td>
<td>12.4</td>
<td>12.4</td>
<td>12.1</td>
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<td>Saunders GS(^1)</td>
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<td>7.1</td>
<td>6.9</td>
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<td><strong>Total</strong></td>
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<td><strong>19.0</strong></td>
<td><strong>19.4</strong></td>
<td><strong>19.3</strong></td>
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<td>Other:</td>
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<td>CNP Generation(^2)</td>
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<td>(0.7)</td>
<td>(0.2)</td>
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**Notes:**

1. Saunders values represent total station production (including energy delivered to HQ).
2. CNP (Canadian Niagara Power) Generation is included in the Niagara Plant Group total production.
Questions?