An Overview of Hydro-Québec

August 31, 2011
Snapshot

- Hydro-Québec is the largest power generator in North America
  - 98% renewable energy

- Hydro-Québec is among the largest power transmission companies in North America
  (> 17B US$ in transmission assets)

- Hydro-Québec is the largest electric utility in Canada
Corporate Structure

23,000 employees

Hydro Québec
Generation

Hydro Québec
TransEnergie

Hydro Québec
Distribution

Hydro Québec
Équipement et services partagés
Hydro-Québec Production

- **Generation assets:** 29B US$
- **98%** renewable energy
- **60** hydroelectric generating stations
- **26 reservoirs**
  (capacity of **175 TWh**)
- **1 nuclear power plant**
- **Capacity:** > 40,000 MW
- **Annual investment:** 2B US$
Hydro-Québec TransÉnergie

- Transmission assets: 17B US$
- 33,453 km of transmission lines
  - Including 11,422 km of 735 kV lines
- 514 transmission substations
- 17 interconnections with neighboring markets (> 6,000 MW)
- Annual investment: 1B US$
Hydro-Québec Distribution

- Distribution assets: 9B US$
- 4 million customers
- Sales breakdown:
  - Residential customers: 41%
  - Large industrial customers: 31%
  - Commercial & institutional customers: 25%
- Smart grid initiatives
  - AMI-Meters
  - Automated reactive power / voltage control
Key Business Priorities

Energy efficiency

Renewable energy

Technological Innovation
Hydroelectric Projects

- Eastmain-1: 507 MW
- Sarcelle: 918 MW – 8.7 TWh
- Rupert Diversion
- Toulnustouc: 526 MW
- Péribonka: 405 MW
- Chute-Allard: 139 MW
- Romaine: 1,550 MW – 8 TWh
- Rapides-des-Coeurs

Commissioned since 2005
Under construction
Greenhouse Gas Emissions

- **Nuclear**: 6 g CO₂ eq/kWh
- **Wind**: 9 g CO₂ eq/kWh
- **Hydroelectric with reservoir***: 10 g CO₂ eq/kWh
- **Photovoltaic solar**: 38 g CO₂ eq/kWh
- **Thermal: natural gas**: 422 g CO₂ eq/kWh
- **Thermal: coal**: 957 g CO₂ eq/kWh

* Northern hemisphere
Electricity Sales Outside Québec (Canada and the United States)

Total electricity sales outside Québec*
* U.S., New Brunswick and Ontario markets

Storage
175 TWh

2009 / 2010

TWh 23.0 / 23.3
B US$ 1.5 / 1.5

Hydro-Québec’s hydroelectric generating stations and reservoirs contribute to market efficiency
> Peak period sales
> Off-peak purchases
Technological Innovation

- **100M US$** invested annually at our research center – IREQ
  - Grid performance / advanced grid simulators
  - Wind power integration
  - Materials performance – nanotech lab
  - Robotics

Electric transportation

- Battery materials
  - Lithium-Iron-Phosphate
  - World-class research team

- Electric motors
  - TM-4 – best power-to-weight ratio in its class
    - Chosen by Tata Motors for Norway/UK pilot

- Charging infrastructure
  - 240-volt charging network with commercial partners
  - 400-volt fast charging stations – HQ and partners
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