



ANETTE MIKES

Enterprise Risk Management at Hydro One (A)

The Toronto skyline glittered in the early gloom of winter as chief executive Laura Formusa returned to her glass-walled office. She knew that the winter season presented Hydro One with its most severe challenges. It had to deliver electricity safely and reliably to 92 municipal utilities, 113 large industrial customers and 1.3 million households in the Province of Ontario while snow, freezing rains and severe winds gusting up to 100 km/hr continually threatened its aging transmission and distribution system. Just last weekend Hydro One's award-winning restoration crews had worked around the clock to restore power to 90,000 customers affected by a winter storm.

Formusa glanced at her watch. She had ten minutes to review a headline news update, sent by chief risk officer John Fraser, in advance of the 30 minute semi-annual review with him of Hydro One's risk profile. Formusa, a 30-year veteran of Hydro One and the company's former general counsel, had been appointed chief executive officer only a few days ago, on 8 December 2006. The company's strategy (posing objectives such as 90% customer satisfaction across the board) had not changed substantially in the last five years. However, she felt that the risks threatening the achievement of the strategic plan had been shifting, to the extent that she had to ask herself – was the strategy tenable?

Company History, Operations and Strategy

Founded in 1906, Hydro One's predecessor, Ontario Hydro generated electric power at Niagara Falls for distribution to municipal utilities.¹ Over time the company had built five coal-fired, 68 hydro-electric and five nuclear power stations, and increased its power generation and transmission capacity to 30,000 megawatts, making Ontario an exporter of electricity to other provinces and the United States. However, by the end of the century it became clear that Ontario's aging electricity system needed a major transformation.

In 1998, the Ontario government deregulated the province's electric power industry. It restructured Ontario Hydro into two separate organizations: a power generation utility and a combined transmission/delivery "poles-and-wires" business to be called Hydro One. Headquartered in Toronto, Hydro One consisted of three businesses—transmission, distribution, and telecommunications, with the first two accounting for 99% of revenue.

¹ Aabo, T., Fraser, J., Simkins, B. (2005), 'The Rise and Evolution of the Chief Risk Officer: Enterprise Risk Management at Hydro One' *Journal of Applied Corporate Finance*, Volume 17, Number 3, pp. 62-74.

Sir Graham Day, a renowned Canadian-born businessman who played an instrumental role in privatizing Britain's utility sector under Margaret Thatcher's government, chaired the Hydro One board. The board had a mandate to prepare Hydro One to become a public company through an IPO that would raise an estimated C\$5.5 billion for upgrading Ontario's transmission infrastructure and for paying down the C\$4.5 billion debt due to the government. The board appointed the senior management team, headed by chief executive Eleanor Clitheroe, a high-profile Canadian businesswoman. In preparation for the IPO, Hydro One's management team embraced new business practices and a cultural change featuring a new consumer-focused service ethos, cost cutting,² enterprise risk management, performance management, and strategic planning. In April 2002, Hydro One prepared an IPO prospectus and began a series of investor presentations. The transformation of Hydro One, however, had raised media and political controversy. Publicity about the private-sector-level salaries of the management team led to a fall-out between the government and the board. The board resigned and ultimately, the replacement board ousted the chief executive.³ A trade union went to court and obtained a ruling that created a legal barrier to the privatization. The government did not appeal, and Hydro One canceled the IPO two weeks before the planned date.

Once the public controversy died down, the new board appointed Australian energy executive Tom Parkinson as CEO. Under his leadership, Hydro One continued to follow Clitheroe's value creation strategy including the implementation of enterprise risk management, a risk-based investment planning system, and a balanced scorecard that featured a strong emphasis on customer service.

Hydro One's rates had to be approved periodically by the Ontario Energy Board, established under legislation. In 2002, unusually hot weather conditions in spring and summer increased energy cost pressures on customers. The Ontario Energy Board mandated lower distribution rates for Hydro One, effectively capping the distribution revenues at about C\$4 billion for the next five years. (See summary financial statements in **Exhibit 1**.) To allow continuing investment in the maintenance and upgrade of its transmission system in this constrained environment, Hydro One launched an efficiency and cost-cutting initiative that led to the departure of 140 staff and a hiring freeze. Rating agencies Standard and Poor's, Moody's and Dominion recognized the improvements in Hydro One's financial profile, and upgraded the company's long term debt to A, A2 and A (high), respectively. But in 2005, 800 professional employees went on an 18-week strike to protest a proposed decrease of benefits to new employees in their union, arising from the cost cutting measures.

The government of Ontario favored conservation initiatives, and was rigorously phasing out coal-fired power stations throughout the province. The ruling party's re-election campaign in the forthcoming election year featured energy savings and environmental conservation. Should the party be re-elected, and pursue initiatives to reduce electricity consumption in Ontario, Hydro One would be expected to lead these initiatives despite their adverse impact on the company's revenues and earnings. Formosa wondered whether Hydro One could deliver on the government's conservation goals without compromising its commercial viability. Hydro One had to manage a complex web of conflicting interests—the multiple agendas of government ministers, regulators, consumers, environmental groups, and capital market debt holders who had recently subscribed to the company's C\$1billion bond issue (not guaranteed by the Province).

² An early retirement scheme in 2000 led to the departure of 1,300 long-serving employees, 20% of the company's staff. The company rebalanced its workforce by the addition of just 126 people and spending C\$4.4-million per annum in outsourcing costs.

³ "An apology for Eleanor Clitheroe". *Canadian Business*, 9-22 October 2006, pp. 80-89.

Hydro One's power transmission capacity, however, remained stretched. Summer heat waves led to record levels of power demand from the company's aging assets. Hydro One had plans to invest more than C\$600 million into the maintenance and growth of its asset base, the largest expansion in 20 years. Yet soaring demand for transmission and distribution systems from China, which was opening new coal-fired power stations at a rate of one per week, had reduced the company's bargaining power with suppliers who were now quoting longer and longer lead times for crucial equipment.

Despite the government's advocacy of conservation, cheap electricity encouraged Canadian consumers to increase their purchases of plasma TVs, air conditioners and other energy-intensive consumer devices. (See trends in Ontario's electricity generation and usage in **Exhibit 2**.) To cope with the increased demand on its aging assets, Hydro One launched an active conservation and demand management program. In one initiative, it became the first electricity company in the world to provide customers with free PowerCost Monitors,TM which gave consumers a quick and easy way of seeing their real-time spending on electricity. The 2006 pilot study of five hundred Ontario homeowners showed that real time electricity monitors helped them reduce their consumption of electricity by up to 8%.

Hydro One's customer-focused strategy contributed to increases of customer satisfaction ratings of large transmission and local distribution company customers from 42% in 2002, to 86% in 2006. Residential customer satisfaction remained consistently strong around 82%. The company's maintenance team regularly received industry awards for rapid restoration of damaged transmission infrastructure during extreme winter weather emergencies.

Upon her appointment⁴, Laura Formusa took stock of the company's status quo:

Turning the company's attention outward to the customer had been a huge change for us. We always knew about our customers' needs, and we always thought we knew the best thing for them. But with the change in our focus in addressing their needs, customer satisfaction has, in some areas, doubled.

Our operating costs, however, remain high, and with the work force reductions under the previous CEOs and the 18-week strike, we lost some of the heart and soul of our employees. We now have a workforce that's not entirely engaged. We also have some reputational risk arising from the departures of the previous CEOs.

Formusa endorsed the vision in a Strategic Plan to make Hydro One the best transmission and distribution business in North America. It would achieve this vision by having the best safety record in the world, top quartile transmission and distribution reliability, 90% customer satisfaction across all segments, top quartile employee productivity, operating efficiency, and an "A" credit rating.⁵ Formusa also intended to reach out and negotiate a long-term deal with the unions.

⁴ The previous chief executive left under a cloud of media furor, after he had been accused by Ontario's auditor general for putting \$45,000 in business expenses on his secretary's corporate credit card, and then approving her claim himself. (Source: Toronto Star, 9 December 2006.)

⁵ "Five Year Vision", company document.

Enterprise Risk Management

The Toronto Stock Exchange was one of the first exchanges that required listed companies to implement high-level, strategic risk management. Pioneering Canadian companies, such as the Royal Bank of Canada, Sun Life and Hydro One developed enterprise risk management in response to this corporate governance requirement.⁶ New policies were changing the energy industry, bringing to the fore new threats and opportunities: climate change and carbon legislation; the deregulation of electricity markets, and the greater adoption of renewable technologies. Chief risk officer John Fraser advocated: “if a company does not have risk management, it would be like driving a car without brakes.”⁷

Hydro One had introduced a three-phase enterprise risk management program. In Phase One, employees participated in a series of workshops to develop a collective understanding of the company’s key strategic objectives and the risks that threaten their achievement. In Phase Two the chief risk officer conducted a series of one-to-one interviews twice a year with senior managers to review the corporate risk profile. In Phase Three, conducted during the annual planning process, Hydro One allocated resources to prioritized investment project proposals based on the risks identified.

Phase 1: Risk Workshops and the Delphi Method

Fraser believed that enterprise risk management started with top management agreeing about strategic objectives, then developing a shared understanding of the principal risks faced by the organization. Fraser acknowledged that his role was to raise questions during interactive risk workshops:

Enterprise risk management is a contact sport. Success comes from making contact with people. Magic occurs in risk workshops. People enjoy them. Some say, “I have always worried about this topic, and now I am less worried, because I see that someone else is dealing with it, or I have learned it is a low probability event.” Other people said, “I could put forward my point and get people to agree that it is something we should be spending more time on, because it is a high risk.”

Prior to a risk workshop, the risk team informally polled managers and drew up a generic list of 60–70 potential risks or threats to the business or the project being discussed. They e-mailed the list to the participating management team asking them to choose the ten most critical risks facing their business or project. Based on these choices, and, if needed, some additional interviews and focus groups, the risk management team narrowed the list to 8–10 risks. A risk officer then started the half-day risk assessment workshop with the presentation of the shortlisted risks, and asked participants to confirm whether these were in fact the most important risks or whether any others should be discussed in detail instead. Then participants talked over the risks, one at a time, and voted on their relative significance.

⁶ According to one widespread definition, embraced by many Canadian boards, enterprise risk management is “the discipline by which an entity assesses, controls, measures and monitors risk from all sources for the purpose of increasing the entity’s short- and long-term value to its stakeholders. (Source: “Risky business”, CA magazine, May 2005.)

⁷ Source: “Risky business”, CA magazine, May 2005.

The meetings used the Delphi-method for voting, which involved a combination of facilitated discussions and iterative anonymous voting technology. The management team assessed each risk by asking, “Which of our stated business objectives are most threatened by that risk and to what degree?” It measured impact for each strategic objective on a five-point scale: Minor (1), Moderate (2), Major (3), Severe (4), and Worst Case (5). For example, an oil spill could be assessed as threatening several objectives – financial, environmental and reputational (see **Exhibit 3**). Fraser explained:

Let’s assume we had an environmental spill of 10,000 liters of oil. We ask people to vote on a scale of one to five as to the consequences if our controls didn’t work. A financial person could use the financial scale by stating, “the last time we had an oil spill, it cost \$10 million to clean up; I call it a 4.” The environmental specialist could assess its impact by saying, “this could cause a significant local off-site impact, I am going to vote a 3.” The head of public relations says “if it gets reported in the local press, the *Toronto Star*, I would call it a 3. If the spill gets into the waterways, it would get covered by the national press, and then I’m going to vote a 4.” Each person in the room identifies a different impact, based on his or her area of expertise. It brings a lot of clarity.⁸

The first vote on the perceived impact of the risk under consideration often showed wide dispersion. The team continued to discuss the causes and consequences of the particular risk. The length of the discussion typically depended on the dispersion of votes in the first voting session. At some point, the team voted again. Usually they needed no more than three voting rounds to agree on the assessment of a particular risk, or in the absence of alignment, a clearly documented cause of disagreement.

For all risks deemed to be Major (3), Severe (4), or Worst Case (5), managers identified the worst credible outcome that could occur within a 2-3 year time frame if certain key controls failed.⁹ In this way, the group assessed the magnitude of a given risk, its probability of occurrence over the next 2-3 years, and the strength of existing controls. (**Exhibits 4** and **5** show the scales used for the assessment of probabilities and control strength.) The group then discussed preliminary action plans and assigned a manager to be the “risk-owner,” typically the project manager or the business’ CEO, with responsibility to develop concrete action plans to mitigate the risk.¹⁰ While the ERM policy was that “risk management is everyone’s responsibility, from the Board of Directors to individual employees,” the risk owner had primary responsibility for deciding whether to accept and live with the risk or to take specific steps to deal with it within a formal risk mitigating process.¹¹

Once the management team had assessed risks and controls, the risk officers prepared a risk map—a two-dimensional rank-ordered chart of “residual risks.” (**Exhibit 6** shows an example of an impact-probability risk map.) Fraser acknowledged that the risk assessment process was subjective, not “scientific.” He liked to quote the physicist Niels Bohr, “prediction is very difficult, especially about the future.” Fraser used the risk meetings to collect and synthesize expert opinions from all areas of the business.

⁸ Interview with John Fraser, May 7, 2008.

⁹ As defined, worst credible outcomes differed both from “inherent magnitudes”, which assumed that all controls failed or were absent, and “residual magnitudes”, which assumed that all key controls were in place and functioning.

¹⁰ Aabo et al., 2005, p. 65.

¹¹ Ibid., p. 67.

One risk officer described the prevalence of the risk assessment meetings:

Our original ambitious plan was to do twelve risk assessments a year. The senior executive team embraced the approach so enthusiastically that one year we did 60 different risk assessment workshops. My role was to help executives tell their bosses about the risks they faced and how they were mitigating those risks. We helped them make judgments about the adequacy of the mitigating actions proposed and taken.¹²

Fraser was also head of internal audit. He maintained a strict distinction between auditing and risk management activities, treating the latter as a “separate product line”: “Risk management staff do not attend internal audit meetings and the information from a risk management meeting is not available to internal audit staff without written authorization from a vice president. I want a complete separation between risk management and internal audit so that people can speak extremely candidly at the risk management workshops.”¹³

Phase 2. Reviewing the Corporate Risk Profile


Twice a year, in January and July, Fraser and his team prepared a Corporate Risk Profile report for the executive team. He also presented the report in person to the Audit Committee. The Corporate Risk Profile summarized the principal risks facing the organization. Fraser did a series of interviews with the top 30 to 40 executives and consulted other sources, such as annual business plans and risk workshops. The profile reflected the managerial assessments of previously identified risks and emerging risks that had been identified in workshops, media scans, or other sources since the last report.¹⁴ An extract from the July 2006 Corporate Risk Profile is shown in **Figure A**. (For a history of the risk profile trends refer to **Exhibit 7**.)

¹² Interview with Rob Quail, May 7, 2008.

¹³ “Q&A with Hydro One’s Chief Risk Officer.” *Compliance Week*, January 25, 2005.

¹⁴ Aabo et al. (2005), p.69.

Figure A Corporate Risk Profile, July 2006

| Risk Source | Risk Rating January 2005 | Risk Rating January 2006 | Risk Rating July 2006 | Trend from July 2006 |
|---|-----------------------------|-----------------------------|--------------------------|--|
| Adequate Electricity Supply | High | Very High | Very High |  |
| Performance, Productivity and People ("Getting the Work Done") | Medium- High | Very High | Very High |  |
| Government Policy Uncertainty | High | High | Very High |  |
| Regulatory Uncertainty | Very High | Very High | High |  |
| Employee Accidents | Very High | High | High |  |
| Capacity of Transmission Network | Medium | Medium- High | High |  |
| Condition of Transmission Network | Medium | Medium- High | Medium- High |  |
| Condition of Distribution Assets | High | Medium- High | Medium |  |
| Customer Expectations | High | Medium- High | Medium |  |
| Environment | Medium | Medium | Medium |  |
| Information Technology | Low | Medium | Medium |  |

Source: Adapted from company document.

Prior to the interviews Fraser sent each manager a two-page list of headline news from the past six months, and the summary of the previous corporate risk profile. (**Exhibit 8** presents the media update used for the December 2006 interview series.) Fraser described the risk review meetings as follows:

I take the one-page strategic objectives, the news update and the summary of the previous risk assessments to all interviews, so the context is clearly set. Then I pull out the empty risk profile template and ask what had changed, what is new. The risk assessments could change because of the mitigation steps taken, or because of external changes in the environment. Some people grab the template and start filling it out on the spot. Others will literally shut their eyes, put their feet up on the desk and tell me what is worrying them.¹⁵

The ERM process stressed the importance of the half-yearly monitoring and review of risks, because risks did not remain static. In order to make sure that the objectives-impacts matrix remained relevant, senior managers, who had accountability for the particular objectives, reviewed and approved the scales annually. The CFO reviewed the financial scale, the chief regulatory officer reviewed the regulatory scale, and so on.

¹⁵ Interview with John Fraser, 7 May 2008

Phase 3. Risk-based Investment Appraisal and Planning

In the final phase of the ERM process senior management set priorities for the maintenance and building programs based on the risks identified. Hydro One managed a portfolio of fixed assets with lifetimes of 30-70 years. It spent about C\$ 1bn per annum on new physical capital. The investment planning department and the risk management team jointly developed a risk-based approach for allocating resources. They evaluated each investment proposal in terms of cost and the severity of the risk that the program aimed to mitigate. They calculated a “bang for the buck” index to show the risk reduction per dollar spent, and ranked the investment programs accordingly. Where the cumulative expenditures reached the level of available resources, they determined the planned work for the year.

Engineers made the initial risk assessments, making use of the tools of risk assessment they received from the investment planning department: the program-specific objective-impact matrix and the probability scale. An additional risk map template assigned an overall risk score to each combination of impact and probability assessment. The investment planning department also acted as an independent mezzanine evaluator, relentlessly challenging and querying the risk and cost assessments, as the engineers prepared the investment proposals for presentation to senior management.

Fraser argued that looking at the investment proposals from a risk management viewpoint gave high visibility and scrutiny to capital expenditure planning, and reassured top management that in a resource-constrained environment Hydro One was making the right investment decisions:

You cannot just make up a “mitigated risk score”. Every year we hold a two-day planning meeting with the senior management team. They review and challenge the investment proposals ranked by the “bang for the buck” index. The engineers have to defend each project proposal in front of senior managers and their peers who challenge them on their mitigated risk score and how much money they plan to spend. This allows management to identify activities that could be stopped, deferred or changed, and to release valuable resources for higher priorities. The process ensures that projects addressing the highest risks have the highest priority.

The Meeting

Laura Formusa closed the headline news update and looked up from her desk as John Fraser entered. After the initial pleasantries Fraser handed over the corporate risk profile template and a brief summary of the risk updates he has collected from interviewing other managers. (See interview summaries in **Exhibit 9**.)

Formusa quickly leafed through the interview summaries. Then she glanced at the corporate risk profile template in front of her and began:

Let me see what I can add from where I sit. Like most industries, we have not been hiring but down-sizing for many, many years. The work load has now exploded, and more than 20% of our employees will be eligible for retirement in two years’ time. “Getting the work done” is more difficult. I am reaching out to the union that was out on strike to begin a new relationship. I want to enter into a five-year deal with them. It would be unprecedented, but I need the union to work with us to address the challenges we are facing. The demographics are against us. In Canada we do not have enough of a workforce waiting for us. Where is it going

to come from? It has to come from tapping new resources, both inside and outside the country.

Safety is our number one objective. I make it part of every management team meeting: whenever we talk about safety, we feel it's our highest risk. It is not enough to make sure we have the tools and the equipment. We have to make people think safety every minute of every day. We also have to deal with the spending controls issue. In order to meet the expectations of the Provincial Auditor General, we must put in place more formalized procedures.

The risks related to the "Capacity of Transmission Network" should be "very high" rather than "high," as the situation is getting more risky. This year's record demand for power shows a strong need for more capacity. As for the condition of the transmission network, I think risks are increasing due to some premature equipment failures we have experienced, despite plans in place to upgrade key transmission stations. However, the condition of distribution assets is stable, due to our good storm restoration plans and the monies we have spent on refurbishments.

Going forward, I expect growing Government uncertainty due to the impending election in October 2007, and some continued confusion over the roles of the several government electricity agencies.

Residential customers are still a challenge, we need to improve satisfaction. The media is always a concern because of reputation risk—we have been in the media too much for the wrong reasons.

The environment is getting to be a bigger issue for the industry as a whole. Time-of-use rates might be the next step in the energy conservation agenda: the smart meter going hand in hand with smart pricing. The question is: are people going to modify their behavior? Are they going to do their dishes at 11:00 at night when the rate goes down? Are they going to use less power? The danger is they are going to choose not to. And all of a sudden a person who had a \$100 per month bill is going to see \$200. When those rates go in, people are going to be screaming dissatisfaction to the government.

Finally, now that we also started to implement SAP, I feel that I.T. risks are increasing, and this should be rated Medium/High rather than Medium.

Later that day Formusa read through the interview summaries received from Fraser, and reflected on her notes from her meeting with him. She wondered whether her own risk assessment and the concerns expressed by the senior management team members fully captured the risk profile of Hydro One. She had to decide if she should revise the strategy of the company in the light of these risks.

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Exhibit 1 Summary Financial Statements*Balance Sheet (in millions of U.S. dollars)*

| For the Fiscal Period Ending | December 31, 2003 | December 31, 2004 | December 31, 2005 |
|--|----------------------|----------------------|----------------------|
| ASSETS | | | |
| Accounts Receivable | 476.7 | 587.5 | 538.8 |
| Other Receivables | -- | -- | -- |
| Accounts Receivable, Total | 476.7 | 587.5 | 538.8 |
| Inventory | 34.8 | 39.1 | 48.0 |
| Other Current Assets | -- | -- | 10.3 |
| Total Current Assets | 511.5 | 626.6 | 597.1 |
| Gross Property, Plant & Equipment | 11,328.6 | 12,704.0 | 13,665.1 |
| Accumulated Depreciation | (4,004.5) | (4,549.6) | (4,991.4) |
| Net Property, Plant & Equipment | 7,324.2 | 8,154.4 | 8,673.6 |
| Regulatory Assets | 325.8 | 368.1 | 343.2 |
| Goodwill | 102.9 | 110.5 | 114.1 |
| Accounts Receivable Long-Term | 15.5 | -- | -- |
| Deferred Charges, Long-Term | 17.0 | 19.1 | 19.7 |
| Other Long-Term Assets | 451.9 | 464.5 | 393.8 |
| Total Assets | 8,748.7 | 9,743.2 | 10,141.6 |
| LIABILITIES | | | |
| Accounts Payable | 364.5 | 523.5 | 600.5 |
| Accrued Expenses | 29.4 | 36.6 | 36.9 |
| Short-term Borrowings | 48.0 | 40.7 | 7.7 |
| Current Portion of Long-Term Debt | 365.2 | 447.9 | 505.3 |
| Other Current Liabilities | 115.3 | -- | -- |
| Total Current Liabilities | 922.4 | 1,048.7 | 1,150.5 |
| Long-Term Debt | 3,512.3 | 3,833.3 | 3,831.5 |
| Pension & Other Post-Retirement Benefits | 462.0 | 543.5 | 614.3 |
| Other Non-Current Liabilities, Total | 531.6 | 558.4 | 499.3 |
| Total Liabilities | 5,428.3 | 5,983.9 | 6,095.6 |
| Preferred Stock, Redeemable | 249.9 | 268.4 | 277.1 |
| Total Preferred Equity | 249.9 | 268.4 | 277.1 |
| Common Stock | 2,564.4 | 2,753.9 | 2,843.2 |
| Additional Paid In Capital | -- | -- | -- |
| Retained Earnings | 506.1 | 737.1 | 925.7 |
| Total Common Equity | 3,070.5 | 3,490.9 | 3,768.9 |
| Total Equity | 3,320.4 | 3,759.3 | 4,046.0 |
| Total Liabilities And Equity | 8,748.7 | 9,743.2 | 10,141.6 |

Exhibit 1 (continued)*Income Statement (in millions of U.S. dollars)*

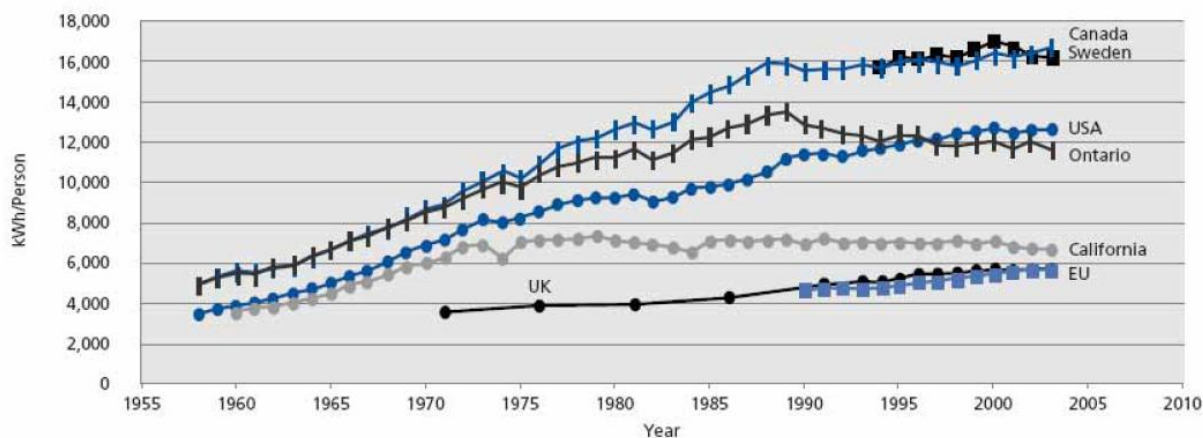
| For the Fiscal Period Ending (in currency) | 12 Months | | |
|---|----------------------------|----------------------------|----------------------------|
| | December 31, 2003 (USD) | December 31, 2004 (USD) | December 31, 2005 (USD) |
| Revenue | 3,120.0 | 3,436.9 | 3,770.6 |
| Other Revenue | 20.1 | 14.1 | 18.0 |
| Total Revenue | 3,140.1 | 3,451.1 | 3,788.6 |
| Fuel & Purchased Power | 1,448.6 | 1,651.2 | 1,828.2 |
| Ops. and Maintenance | 615.2 | 640.7 | 679.5 |
| Depreciation and Amortization | 351.3 | 398.9 | 417.8 |
| Other Operating Expense | -- | -- | -- |
| Total Operating Expense | 2,415.1 | 2,690.7 | 2,925.5 |
| Operating Income | 725.1 | 760.3 | 863.1 |
| Interest Expense, Total | (272.4) | (219.4) | (229.1) |
| Interest and Investment Income | 5.4 | 1.7 | 4.3 |
| Net Interest Expense | (267.0) | (217.7) | (224.8) |
| Other Non-Operating Income (Expense) | (2.3) | 18.3 | (54.0) |
| Net Income Before Tax | 455.8 | 560.9 | 584.2 |
| Income Tax Expense | 149.3 | 147.1 | 169.9 |
| Net Income After Tax | 306.4 | 413.8 | 414.4 |

Source: Capital IQ. Accessed on June 19, 2008.

Exhibit 2 Ontario Electricity Generation and Usage Trends**Exhibit 2A:** Existing Installed Generation Capacity, Ontario, 2006

| | Capacity (MW) | No. of Stations | % of Total Capacity |
|----------------------|------------------|--------------------|------------------------|
| Nuclear | 11,419 | 5 | 36.6 |
| Hydroelectric | 7,768 | 68 | 24.9 |
| Coal | 6,434 | 4 | 20.6 |
| Oil/Gas | 5,103 | 22 | 16.4 |
| Wind | 395 | 4 | 1.3 |
| Biomass/Landfill Gas | 70 | 4 | 0.2 |
| TOTAL | 31,189 | 107 | 100.0 |

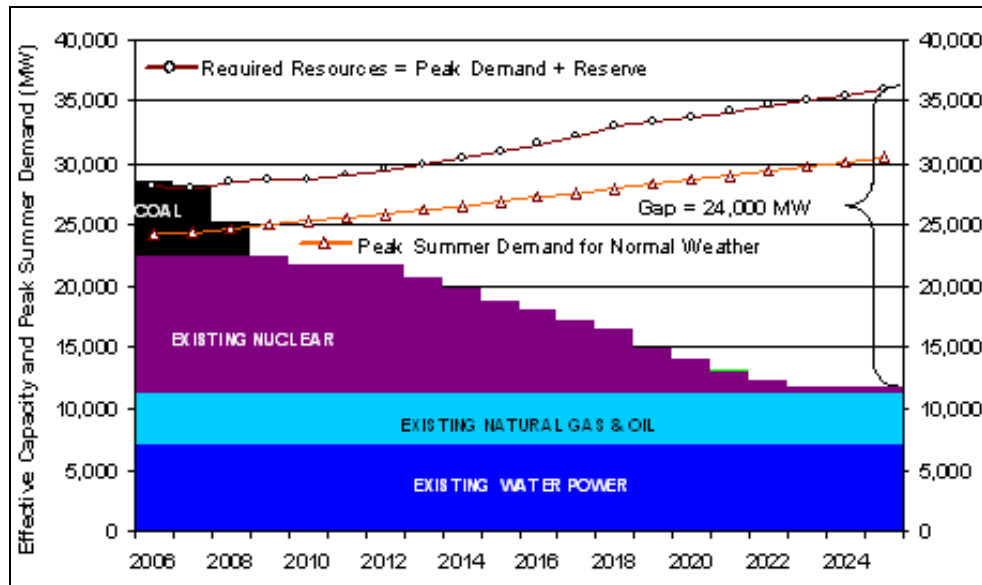
Source: Adapted from Independent Electricity System Operator, "18 Month Outlook: An Assessment of the Reliability of the Ontario Electricity System, January 2007 to June 2008," December 21, 2006, accessed June 27, 2008, http://www.ieso.ca/imoweb/pubs/marketReports/18MonthOutlook_2006dec.pdf.

Exhibit 2B: Comparative Trends in Electricity Consumption (Canada, Ontario, Sweden, United States, California and the European Union)**PER CAPITA ELECTRICITY CONSUMPTION**

Source: "Electricity, Conservation and the Conservation Bureau." Presentation by Peter Love, Chief Energy Conservation Officer, Conservation Bureau, to the Ontario Energy Association on February 10, 2006, accessed June 24, 2008, http://www.powerauthority.on.ca/Storage/20/1608_OEA_PL_Feb_10_06.pdf.

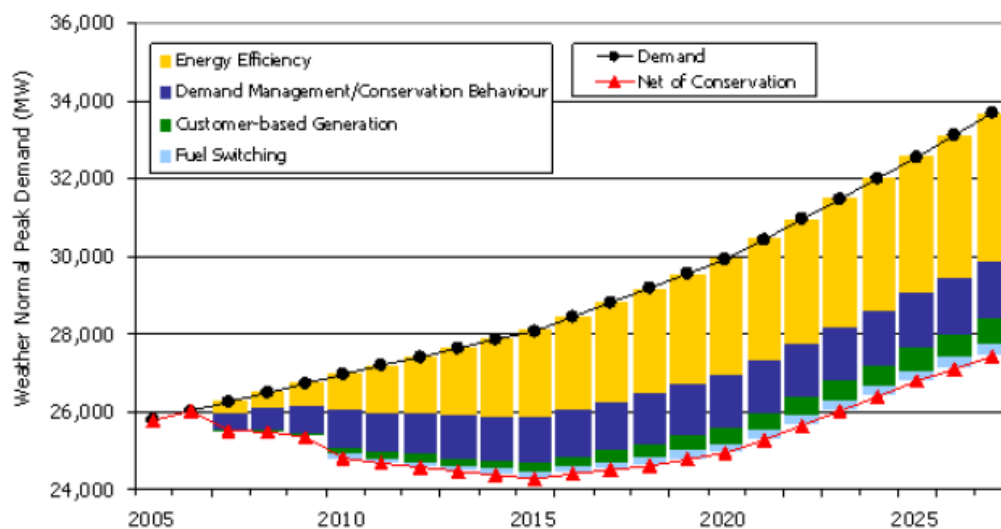
Exhibit 2 (continued)

Exhibit 2C: Projected Generation Capacity Shortfalls for Ontario, 2005-2025



Source: Ontario Power Authority, "Supply Mix Summary," December 2005, accessed June 27, 2008, <http://www.powerauthority.on.ca/Page.asp?PageID=122&ContentID=1139&SiteNodeID=139>.

Exhibit 2D: Ontario's Expected Electricity Demand and the Planned Impact of Conservation Policies



Source: "Electricity Outlook in Ontario" presentation by Amir Shalaby, Vice President of Power System Planning, to the 5th Annual Atlantic Canada Power Summit, on September 25, 2007, accessed June 24, 2008, http://www.powerauthority.on.ca/Storage/56/5166_AS_AAC.pdf.

Exhibit 3 Objectives-Impact Matrix

| Objective | Attribute | Event | 5 Worst Case | 4 Severe | 3 Major | 2 Moderate | 1 Minor |
|-------------------------|--|---|--|--|--|--|---|
| FINANCIAL | Net Income | Net Income Shortfall (after tax, in one year) | >\$150M | \$75M-\$150M | \$25M-\$75M | \$5M-\$25M | <\$5M |
| | Credit Worthiness | Change in financial ratios or risk | Event of default; Unable to raise any capital due to credit rating. | Credit rating downgrade to below investment grade; Unable to raise full amount required capital. | Credit rating downgrade. | Hydro One Inc. put on credit "watch" . | Credit rating agencies and bondholders express concern. |
| | Value of the Enterprise | Loss in Value of Hydro One | Loss of >25% Value | Loss of 10-25% Value | Loss of 5-10% Value | Loss of 1-5% Value | Loss of <1% Value |
| REPUTATION | Public Profile | Negative media attention; Opinion leader and public Criticism | National media attention; Opinion leaders/customers nearly unanimous in public criticism. | Provincial media attention; Most opinion leaders/ customers publicly critical. | Significant local attention; Several opinion leaders/ customers publicly critical. | Letter(s) to Minister of Energy. | Letter(s) to Senior Management. |
| | Shareholder confidence | Owner/ shareholder involvement in Hydro One operations | Complete loss of confidence; CEO and Board replaced by the owner. | Extensive loss of confidence; CEO or several Sr. Managers replaced. | Credit Rating agencies and bondholders express concern. | Confidence in question; owner requests significant changes to business plan. | Some concern with management decisions; occasional requests from owner for details. |
| | Employee confidence | Employee Dissatisfaction | Widespread departures of key staff with scarce skills or knowledge. | Sharp, sustained drop in employee survey results; departures of key staff with scarce skills or knowledge. | Sharp decline in employee survey results; sharp increase in grievances. | Modest decline in employee increase in grievances. | Less than planned improvements in employee survey results. |
| REGULATORY RELATIONSHIP | Meet License Conditions | Loss of Credibility with Regulators | General loss of Credibility; Intrusive Involvement. | Some loss of Credibility; Excessive Involvement. | Some Concerns re: Competence; Difficult Demands. | Increase in Reporting Detail and Frequency. | Balanced; some challenges. |
| CUSTOMER/ RELIABILITY | Reliable Delivery of Electricity | Outages on the Hydro One system | Outage affects: >100,000 Customers Distribution or >1000MW Transmission for more than seven days. | Outage affects: 40k-100k Customers Distribution or 400-1000 MW Transmission for 4-7 days. | Outage affects: 10k-40k Customers Distribution or 100-400MW Transmission for 2-4 days. | Outage affects: 1k-10k Customers Distribution or 10-100MW Transmission for 4-24 hrs. | Outage affects: <1000 Customers Distribution or <10MW Transmission for <4 Hrs. |
| | OEB Service Quality Indices | Failure to Meet Service Quality Indices | Achieve 25% of Overall Expected Performance. | Achieve 67% of Overall Expected Performance. | Achieve 80% of Overall Expected Performance. | Achieve 90% of Overall Expected Performance. | Achieve 95% of Overall Expected Performance. |
| | Direct Customers, Local Distribution Companies, Generators | Increase in customer dissatisfaction with Hydro One | Numerous Direct Customers initiate action such as bypass or relocation; Numerous LDC's default on bill payments; Generator reluctance to locate in Ontario leads to shortages. | Exponential increase in customer lawsuits for direct and/or collateral damage believed to be caused by Hydro One: Complaints to provincial government increase dramatically. | Customer associations step up lobbying efforts for stricter penalties against Hydro One. | One "large" customer experiences significant production losses due to Hydro One actions/inaction; high level (CEO, COO, etc.) calls to Hydro One CEO's office. | Increase in number of customer complaints. |
| COMPETITIVENESS | Residential and Small Business Customers | Increase in customer dissatisfaction with Hydro One service quality | Significant numbers of customers begin to default on bill payments. | Exponential (>50%) increase in call centre volumes and complaints received by field staff. | Call centre volumes increase noticeably (25%); noticeable increase in complaints received by field staff. | Sharp deterioration in customer satisfaction as per survey responses. | Moderate deterioration in customer satisfaction as per survey responses. |
| | Unit Cost Reduction | Failure to Reduce Unit Costs (incl. overhead & non-billable time) | Unit Costs increase by >25% | Unit Costs increase by 15%-25% | Unit Costs increase by 10% -15% | Unit Costs increase by 5% -10% | Unit costs not reduced |
| | Work Program Accomplishment | Work Program Shortfall | >10 Critical Projects late or <50% of noncritical work completed. | 5-10 Critical Projects late or 50%-70% of noncritical work completed. | 3-5 Critical Projects late or 70%-85% of non critical work completed. | 1-3 Critical Projects late or >85% of non critical work completed. | No Critical Projects late >85% of non critical work completed. |
| SAFETY AND ENVIRONMENT | Employee: Workforce Availability/ Safety | Change in availability (%) in one year. Accident Severity Rate. | Key functions/locations unavailable > 1 week; Employee fatality or major permanent disability. | Key functions/locations unavailable > 1 day; Employee critical injury. | Accident Severity Rate > 50% above target. | Accident Severity Rate > 25% above target. | Accident Severity Rate above target. |
| | Environmental Performance | Adverse Environmental Impact | Widespread ofsite impacts e.g., regional or municipal water supply. | Multiple local ofsite impacts e.g., multiple residential properties or private water supplies. | Significant local ofsite impact e.g., a public thoroughfare; Significant spill/release with impact on Hydro One Inc. property only | Minor local ofsite impact e.g., a single residential property or private water supply). | Minor impact on Hydro One Inc. property only. |
| | Public Safety | Public Injuries with Hydro One at fault. | Fatality or major permanent disability. | Significant increase in number of injuries. | Moderate increase in number of injuries. | Small increase in number of injuries. | No change. |

Source: Company document.

Minor = noticeable disruption to results; manageable. Moderate = material deterioration in results; a concern; may not be acceptable; management response would be considered. Major = significant deterioration in results; not acceptable; management response. Severe= fundamental threat to operating results; immediate senior management attention. Catastrophic = results threaten survival of company in current form; potentially full time senior management response until resolved.

Exhibit 4 Probability Scales

| Score | Rating | Description |
|-------|-------------------|---|
| 5 | Virtually Certain | 95% probability that the event will occur in the next 36 months (i.e., to this project) |
| 4 | Very Likely | 75% probability that the event will occur in the next 36 months (i.e., to this project) |
| 3 | Even Odds | 50% probability that the event will occur in the next 36 months (i.e., to this project) |
| 2 | Unlikely | 25% probability that the event will occur in the next 36 months (i.e., to this project) |
| 1 | Remote | 5% probability that the event will occur in the next 36 months (i.e., to this project) |

Source: Company document.

Exhibit 5 Control Strength Assessment

| | | |
|---|--|--|
| 5 | Full Controls; Highly Prescriptive; CEO Oversight | Full controls established (see “Full Controls” below), PLUS: <ul style="list-style-type: none"> Objectives, policies, plans and measures all formally established with the direct personal involvement of CEO, and clearly documented Authorities, responsibilities and accountabilities very tightly defined. Formal coordination of decisions of different parts of the organization through senior management “steering committees” or other mechanisms. Highly prescriptive/detailed procedures exist Continuous monitoring of performance; results are reported frequently to CEO and required improvements are personally followed-up by senior management Overall controls are subject to formal, independent review |
| 4 | Full Controls; Prescriptive; Senior Mgmt Oversight | Full controls established (see “Full Controls” below), PLUS: <ul style="list-style-type: none"> Objectives, policies, plans and measures all formally approved by senior management and clearly documented Authorities, responsibilities and accountabilities tightly defined Formal coordination of decisions of different parts of the organization through “steering committees” or other mechanisms. Prescriptive procedures exist Close, frequent monitoring of performance; results are reported regularly to senior management and required improvements are closely followed-up Overall controls are subject to formal review |
| 3 | Full Controls | The following controls exist: <ul style="list-style-type: none"> Business objectives communicated to all levels Policies established & communicated so that people understand expectations Plans have been established and communicated Measurable performance targets set Authorities, responsibilities and accountabilities established People have the necessary knowledge and skills People have the necessary resources and tools, including appropriate computer systems Adequate, timely communication/coordination to allow people to perform their responsibilities Control activities such as procedures in place and appropriately scaled to risk Performance is monitored against targets; Assumptions are challenged periodically Follow-up to ensure effective change Overall control is periodically assessed Residual risks accepted on a cost-benefit basis |
| 2 | Partial Controls | Significant gaps in: <ul style="list-style-type: none"> Business objectives; Risk assessment; Policies Performance targets and measures; plans Authorities, responsibilities and accountabilities Knowledge and skills; Resources and tools, including appropriate computer and information systems Communication to allow people to perform their responsibilities Coordination of decisions of different parts of the organization Control activities such as procedures Performance monitoring against targets; Follow-up to ensure effective change Overall control assessment Business objectives largely undefined. Policies, practices and procedures not established or not used No performance targets; no monitoring of performance Business values not articulated; distrust at many levels Accountabilities and responsibilities not clearly established Many staff untrained; without necessary knowledge or tools Constant reliance on knowledge of one person; no depth in control system No realistic plans for improvement Controls reactive; no “preventative” or “anticipatory” mechanisms |
| 1 | Few Controls | <ul style="list-style-type: none"> Business objectives largely undefined. Policies, practices and procedures not established or not used No performance targets; no monitoring of performance Business values not articulated; distrust at many levels Accountabilities and responsibilities not clearly established Many staff untrained; without necessary knowledge or tools Constant reliance on knowledge of one person; no depth in control system No realistic plans for improvement Controls reactive; no “preventative” or “anticipatory” mechanisms |

Source: Company document.

Exhibit 6 Impact-Probability Risk Map

July 2006 Risk Map

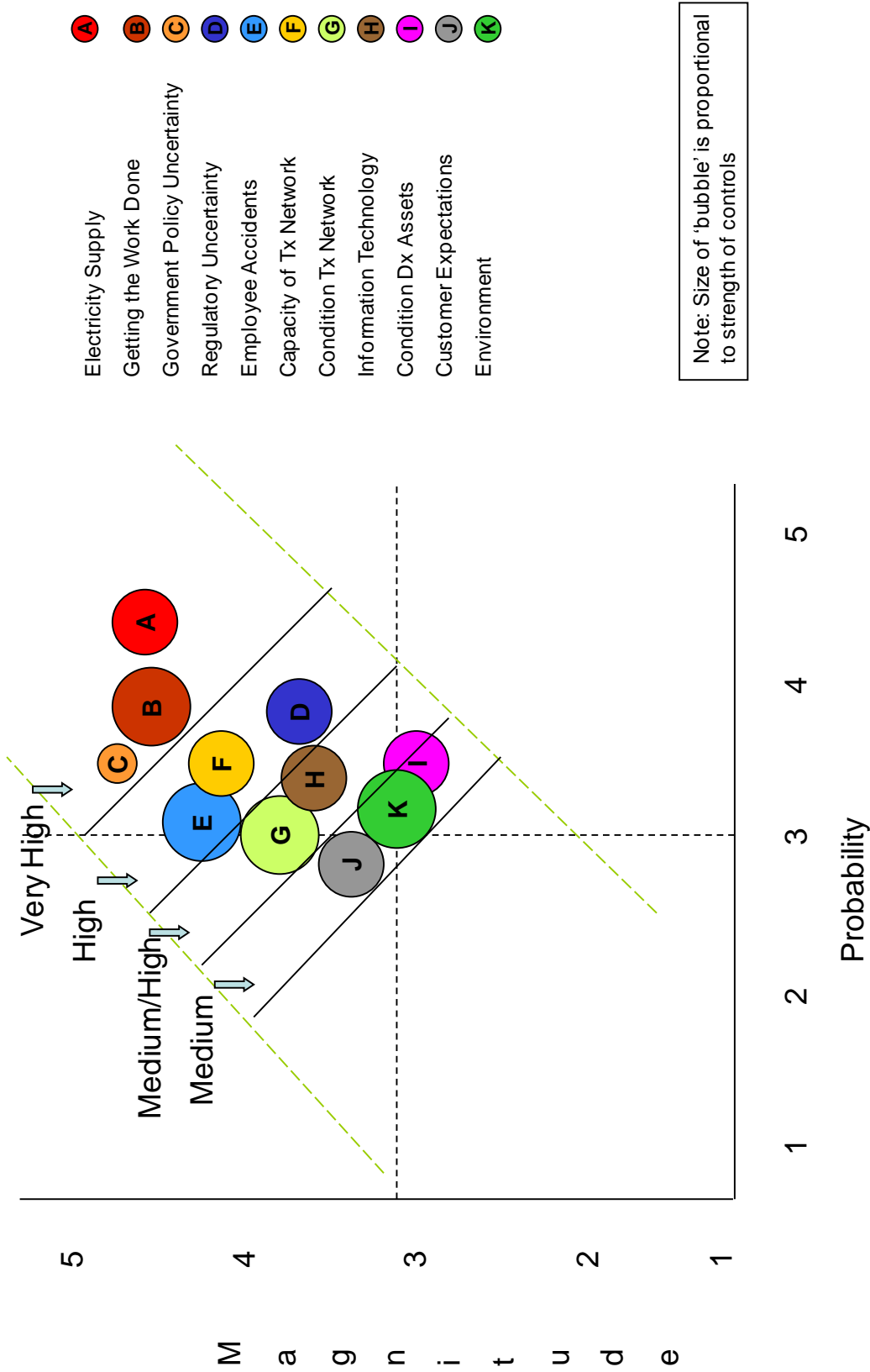


Exhibit 7 Corporate Risk Profile Trends

| | 1999 Q4 | 2000 Q2 | 2000 Q4 | 2001 Q4 | 2002 Q4 | 2003 Q2 | 2003 Q4 | 2004 Q2 | 2005 Q4 | 2006 Q2 |
|---|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| REGULATORY/MARKET | | | | | | | | | | |
| Regulatory Uncertainty | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 5 | 5 | 4 |
| Economy/Financial Markets | 3 | 3 | | | | | | | | |
| Electricity Supply/Marketplace | 3 | 3 | | | 4 | 3 | 4 | 4 | 5 | 5 |
| Customer Expectations/Relationships | | | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Commodity Price Volatility | | | | 3 | | | | | | |
| STRATEGIC | | | | | | | | | | |
| Growth | 5 | 5 | 3 | | | | | | | |
| Government Policy Uncertainty | | | 5 | 5 | 5 | 5 | 4 | 5 | 4 | 5 |
| Investor Expectations | | | | 4 | 3 | | | | | |
| First Nations | | | | | | | | | 3 | 3 |
| Outsourcing | | | | | | | | | | |
| Network Services Launch | | 4 | | | | | | | | |
| OPERATIONAL | | | | | | | | | | |
| Organizational Readiness (Competence and Capability) | 4 | 4 | | | | | | | | |
| Catastrophic Events | 4 | 4 | | | | | | | | |
| Asset Condition | 4 | 4 | 4 | 4 | 4 | | | | | |
| Asset Condition—Transmission | | | | | | | 3 | 3 | 4 | 4 |
| Asset Capacity—Transmission | | | | | | | | | 3 | 3 |
| Asset Condition—Distribution | | | | | | 4 | 4 | 4 | 4 | 3 |
| Environmental Contamination | 4 | 4 | 4 | 3 | 3 | | 3 | 3 | 3 | 3 |
| Safety | 3 | 3 | 3 | 3 | 5 | 5 | 5 | 5 | 4 | 4 |
| HR | | | 3 | 3 | 4 | 4 | | | | |
| Cost Reduction | | | 5 | 5 | 3 | 3 | | | | |
| Info Management | | | 3 | | | | | | 3 | 3 |
| "Getting the work done" | | | | | | | 3 | 3 | 5 | 5 |

Source: Company document.

Exhibit 8 Changes/Events Since Last Risk Profile (July to December 2006)**Provincial Government**

- Minister proposes lifting moratorium on purchase and sale of distribution assets by Hydro One.
- Ontario government could pay millions of dollars in penalties if, come 2009, it does not have enough transmission from recently opened nuclear power station owned by U.K. firm Bruce Power.
- Deputy Minister of Energy, James Gillis, joins Desjardins Securities.
- Premier Dalton McGuinty warns executives at Hydro One that lavish perks and abusing expense accounts will no longer be tolerated.
- Public musings by government about viability of coal plant reduction.

Electricity Supply

- Former Pikangikum chief said increasing energy demands has made it impossible for this first nation community to turn on Christmas lights.
- Hydro One announced a new incentive program for medium-sized interval metered customers for actions they take to reduce peak energy usage.
- Ontario Power Authority calls for upgrades to Bruce - Milton/ Toronto line.
- Ontario Power Authority has approved 7 projects that will contribute 414 MW.
- Hydro One reconnects circuit to US in Sarnia area (damaged April 2003).
- Hydro One project in Caledonia is in limbo preventing improved power transmission. A first nation community occupied the construction site, and claim that their right to access was violated.
- Heat drives Ontario power use to record at 27,005 MW.

Regulatory

- Ontario Energy Board lowers cost of electricity for consumers (c5.8 to c5.5 & c6.7 to c6.4).
- Ontario Power Generation, the province-owned electricity giant, today started the federal approvals process for a license for new nuclear units at its Darlington Nuclear site.
- Hydro One's Transmission Rate Application filed with Ontario Energy Board in September 2006.
- Hydro One cited for excellence in the audit report delivered by the North American Electric Reliability Council, assessing Hydro One's physical security procedures as 'industry-leading'.

Vendors

- Midpoint in Inergi outsourcing agreement with Hydro One will be March 2007.
- Vertex parent, United Utilities, decides to put the outsourcer up for sale.

Capital Markets

- Dominion Bond Rating Service upgrades Hydro One to "A (high)" from "A".

Governance

- Ontario government threatens salary caps for senior executives of crown corporations.

Safety

- Break-in and theft from Hydro One compounds of copper wire.
- Electrical Safety Authority changes fines for non-compliance to \$1 million.

Environment

- Canada listed as one of the biggest energy hogs in the world.
- Ontario to be continent's solar hot-bed.
- Vandalism caused oil spill in Welland – spill not “catastrophic”.
- Fire at Pinard of 750 KVA transformer.
- Federal legislation gazette requires virtually all PCBs^a to be eliminated by 2025.

Human Resources

- Skilled worker shortages continue to make news; 66% of Canadian employers report difficulty filling positions.
- Mandatory retirement ends Dec. 12, 2006.

Media

- Auditor General issues report.
- Energy minister Duncan is unhappy: says that the culture in Hydro One is unacceptable.
- Hydro One board accepts Tom Parkinson's resignation effective Dec. 8, 2006.
- Article sympathetic to Eleanor Clitheroe circumstances in the October 2006 issue of Canadian Business magazine.
- Among numerous storms, Hydro One works to restore power to 150,000 customers in communities most affected.
- Media coverage on Smart Meters mainly positive, some skeptical.
- Front page coverage on increased costs of multiple regulatory electricity agencies.

Outside of Ontario

- The Alberta Electric System Operator announced that the province's grid could not safely accommodate more than 900 megawatts of wind-power generation, a target that will be met late next year.
- Brookfield Power Corp. (the North American energy giant) is now harnessing the wind, with its massive Prince Wind Energy Project set in motion with 66 football-field-sized wind towers with capacity to deliver 99 MW of energy to the grid.
- Rotating blackouts hit Alberta: High summer temperatures cause record power consumption levels.
- Consolidated Edison in week-old struggle to restore power in borough of Queens NYC – underground cables had burned out in those areas.
- British Columbia windstorms, Denver snowstorms among events that point to increasing climate change and increasing likelihood of more unplanned outages.

Source: Company document.

^aPCBs are persistent organic compounds, containing chlorine, used in electric transformers and capacitors because of their insulating capacity and fire resistance.

Exhibit 9 Risk Assessment Interview Summaries (December 2006)*Interview with Beth Summers, Chief Financial Officer*

'Beth's key concern is our huge infrastructure building program and how we shall finance it. We are committing over C\$ 600 million to build a new 182-km 500-kilovolt line beside the two existing ones to bring electricity down from the Bruce nuclear plant on Lake Huron to Milton and the Greater Toronto Area. In the Bruce area, apart from the nuclear station, there's a lot of wind electricity generation that's being developed today. The two lines we have are insufficient. To finance the project, we have to raise debt. We need good financial results to keep bondholders happy.

"Government policy uncertainty" – We are impacted and therefore have to worry about the policy decisions around renewable energy. The government has decided to shut down coal-fired power stations, but renewable energy has its own challenges too. Wind power is a special challenge on transmission because of uncertainty about when wind will be blowing; also, there is no effective existing method for storing wind-generated, or any type of electricity.

"Transmission and distribution capacity" – With the roll-out of smart meters we need a new electricity commodity pricing structure, to reinforce conservation and demand management. The real-time monitors will modify customer behavior, as was the case in our pilot project. If households start buying solar panels to generate electricity, they may want to sell power back into the system. Our distribution system was designed to deliver electricity, not to accept electricity potentially at every household; we are not sure how to deal with this.'

Interview with Peter Gregg, Vice-President, Corporate & Regulatory Affairs

'Peter sees a growing disconnect between our desire and obligation to act as a commercial corporation, and the social policy initiatives that our shareholder, the government has. The Minister of Finance wants dividends, but the Minister of Energy desires requirements that don't mesh with net income maximization.

A new and growing issue is aboriginal consultation. The Bruce-Milton/Toronto project requires us to acquire land and consult with aboriginal groups. First nations people have unique rights that are protected by the Canadian constitution and the law has established that where proponents may infringe on aboriginal rights, the Crown (government) has a duty to consult. But the government does not have a policy on how to enable this. In many ways we will be the test case. There is a huge amount of political risk and commercial risk, if we end up in a protracted disagreement with first nations.'

Interview with Susan Frank, Chief Regulatory Officer

'It is the first time in 20 years that we had asked the Ontario Energy Board for a huge project leave to construct, in relation to the Bruce-Milton line project. It is not something we do every year, so there is a very high risk involved in the approval process. Our only similar experience in living memory is with large transmission stations. Those typically took 10 years to build, considering the time needed to get the environmental approval, the leave to construct approval, and then to order our materials and build.

There will also be a lot of landowner issues with extensive negotiations to reach appropriate compensation. Since history would have seen first nations communities living in these parts, they still have rights to hunt and fish and access land, so we shall have to provide economic consideration to them if we want to build. The prime example of how the risk can go bad is the Niagara line that got built all except for about six towers in Caledonia. We thought we talked to and had agreements with all the right people. And then in the Caledonia area, a community of first nations people became concerned about a housing development that happened to be right beside our line. They put up a physical blockade, blocked the roads preventing access to our site and the completion of our transmission line. The housing developer walked away. This is now a problem far beyond the company. It is a provincial government issue and a federal government issue. Meanwhile, a C\$200 million investment is sitting there not used because we cannot finish that last little piece.

As for employee safety, we have good controls in place, so the risk is decreasing, given all the mitigation we've taken.'

Source: Company information collected by casewriter.