Climate Change Adaptation in Ontario's Electricity Sector

AN INITIAL MEETING TO DISCUSS THE FORMATION OF AN ELECTRICAL SECTOR WORKING GROUP ON EXTREME WEATHER RESILIENCE

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Presented by:

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Background

- September 26th, 2011 - Clean Air Partnership (CAP) presented an expert-led, technical workshop *Climate Change Adaptation in the Electricity Sector*.
- The event, held in the City of Guelph brought together experts on climate change adaptation in the electricity sector with representatives from Ontario electricity :
  - Distribution;
  - Transmission;
  - Generation;
  - Regulatory entities and other interested parties.




Presentations: Overview of impacts in the sector

- Dr. Quentin Chiotti delivered an overview of the current climate and expected changes in Ontario, and the expected impacts of these changes for the electricity sector.
- Discussion included:
  - Federal Program on Energy Research and Development 1998-2002 looked at generation, transmission and distribution in context of climate change. It found that the integrated nature of the Canada's energy system contributed to greater vulnerability for the sector in the context of climate change. The program developed adaptation strategies for the energy sector given climate scenarios.
  - By the end of 2009, nearly 63 percent of CEA member companies reported that they have some plans in place to adapt to the impact of climate change.
  - Particularly important is the projected decreases in Great Lakes water levels which could reduce hydroelectricity output by more than 1,100 megawatts from turbine generators.

Business impacts to the sector

- Christophe Amado of Acclimatize delivered a presentation on the business impacts that the electricity sector will likely face due to climate change, as well as the climate considerations and barriers that are important to business continuity planning.
- Discussion included:
  - Carbon Disclosure Project Questionnaire for businesses showed that awareness of climate change risks in the sector is good, with 93% of global electric utilities acknowledging exposure to a changing climate and 59% identifying potential business opportunities. However, adaptation action remain limited, with only 27% indicating a 'quantified' analysis had been undertaken and only 6% providing evidence climate change has been integrated into their internal corporate governance procedures.
  - On a positive note the U.K. National Grid 2010 Climate Change Adaptation Report 2011 reported that : "*The management of these risks is already at an advanced stage of being embedded into the normal day to day business risk processes*".

Centre for Energy Advancement through Technological Innovation (CEATI)

- Dr. Janos Toth first spoke as Chair of the Interest Group on Overhead Line Design and Wind and Ice Storm Mitigation (WISMIG) through the Centre for Energy Advancement through Technological Innovation (CEATI)
- CEATI responding to climate change risks:
  - Has conducted research on climate impacts for electricity generation, transmission & distribution .
  - Studies by specific working groups to address challenges that electricity stakeholders face.
- Presented BC Hydro's actions on adaptation in operations

Developments at BC Hydro

- Generation:
  Changes to energy and peak load patterns; change design to accommodate extreme events; relocate facilities; try out new materials and components; develop alternative water storage for nuclear facilities; change design and maintenance standards; hydrophobic coating for solar panels to diminish ice or snow cover; better weather forecasting for hydro, wind and solar generation; and conduct hazard reviews for both employees and infrastructure.
- Transmission:
  Change design standards to withstand new levels; change vegetation control practices; perform wind climate change studies; change design and maintenance schedules; relocate existing facilities; and consideration of robotics for field work.
- Distribution:
  Energy storage for load peak sharing; corrosion resistant hardware; use material suitable for an urban environment; dynamic thermal circuit rating; review emergency response measures; and dynamic rating for transformers.

Canadian Standards Association

- Mike Mortimer, Canadian Standards Association, introduced the process of standard creation and mainstreaming and understanding of tools that can be used to encourage action in this industry.
- Discussion :
  - Explored the role of standards in the electricity sector;
  - Understanding of how codes and standards can be used to motivate adaptation, relevant to the electricity sector and
  - Offered an in-depth case study on overhead line standards as they have developed.

Conclusions & Next Steps

- Participants suggested next steps including the following:
  1. **Detailed weather-specific vulnerability assessments** in each of the transmission, distribution, generation and policy development areas, as well as review and analysis of relevant, detailed, current climate projections.
  2. Better understanding of the **climate related threats to the security of the electricity system and benefits of adaptive action.**
  3. Utilize modeling of **risk scenarios to determine the best response**.
  4. Enhance consumers' understanding of **essential functions of and risks** to the electrical sector posed by climate change.

Conclusions Next Steps (cont'd)

5. Rate review rules are biased against proactive, forward-looking actions due to sensitivity to electricity rate hikes.

6. The sector needs clear direction and political commitment to foster dialogue and action on proactive adaptation leading to the retrofit of existing infrastructure.

7. The Ontario electricity system is compliant with established industry standards and is delivering reliable service; in order to upgrade for future risks the sector will need new climate adapted standards.

8. A process to address the overall infrastructure deficit in the sector would help the sector respond to climate risks.

Thank You

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