CONSUMER CONFIDENCE IN GRID RESILIENCY INVESTMENTS

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Brandon Municipal Airport – 2014

(John Woods/Canadian Press)

Strengthening Grid Resilience Sounds so Obvious

Extreme weather events are a key concern for Canada and there is growing **confidence** that **some types** of **extreme events** will increase in frequency and/or intensity as the climate continues to warm.

- *Canada in a Changing Climate: Sector Perspectives on Impacts and Adaptation* - Natural Resources Canada, 2014

The **collapse of several electric power transmission lines** in the Montérégie region during the 1998 ice storm and the damage caused to buildings and transportation infrastructure during successive marine submersion and flooding events that affected areas of eastern Québec in 2010 reveal **Québec society's vulnerability** to climate hazards.

- *Quebec in Action: Greener by 2020* - Government of Quebec, 2012

Upon proclamation of the Infrastructure for *Jobs and Prosperity Act*, the province and the broader public sector would be required to **consider** environmental impacts and **climate change resiliency in making infrastructure decisions.**

- *Ontario's Climate Change Strategy* - Ontario Ministry of the Environment and Climate Change, 2015

Until You see the Headlines

Rising transmission costs pushing Alberta power bills to new heights: report

Calgary Herald March 30, 2016

How Manitoba's 'green' power dream became a nightmare of runaway costs

Graham Lane and Tom Adams, Special to Financial Post, April 14, 2016

Braid: Albertans already gouged as more power woes loom

Calgary Herald, March 30, 2016

Or You Ask Who Will Pay?

determining how those costs **will be shared by the private and public sectors** and recovered from customers **remains a challenge.**

- *Governor's Guide to Modernizing the Electric Power Grid* – National Governors Association, 2014

Or Ask What the Marketplace will look like in 10 Years?

Electricity consumers are proving to be the **game-changer** in this arena as evidenced through growth in the use of distributed (decentralized) generation . . [and] essentially **leaving their utility and the grid behind.**

- *Modernizing America's Electric Grid: Solutions for Transmission, Storage, Distribution & Resilience* – National Electrical Manufacturers Association, 2014

Or Ask What Consumers Think?

The public is looking to utilities to accelerate infrastructure upgrades to improve resiliency.

- *Governor's Guide to Modernizing the Electric Power Grid* - National Governors Association, 2014

AML unreasonably incurs extra costs to maintain higher than industry norm reliability

- *Written Evidence of the Ratepayer Group* - before the Alberta Utilities Commission, September 2015

Residential consumers are not a monolithic class . . .

- *2014 State of the Consumer Report* - Smart Grid Consumer Collaborative, 2014

Or Try to Define a Resiliency Investment

Large Transmission Projects?

- An additional 750 MW interconnection provides increased electric reliability to Manitoba through **additional capacity for imports** in times of drought or **infrastructure outages.**
  - *Needs For And Alternatives To (NFAT) Review of Manitoba Hydro's Preferred Development Plan: Final Report* – Manitoba Public Utilities Board, 2014
- Manitoba is vulnerable to catastrophic power failures caused by **ice storms, tornadoes, fires** or other events that might damage either the transmission lines or the Dorsey station. The Bipole III line is intended to **reduce this vulnerability** by ensuring that a large amount of electricity can be transmitted to the main population centres by a **different route**
  - ***Bipole III Transmission Project: Report on Public Hearing* – Manitoba Clean Environment Commission, 2013**

Microgrids and Energy Storage?

A Transcontinental Electric Grid?

More granular investments?

- Poles made of reinforced concrete
- Training and exercises to help asset operators
- Siting infrastructure in more expensive but less vulnerable locations
  - *Resiliencies in Regulated Utilities* - Keogh, Cody, 2013

Or perhaps most fundamentally…

Ask whether You Have the Political Capital to Deliver?

Ten years ago . . . decision makers **remained confident** that the broader public understood the need for new energy projects and that the necessary level of political support could be found.

Events in the past decade have shaken that confidence. More and more projects of many different sorts come in for **vociferous and effective opposition** from a wide variety of local communities including aboriginal communities and from environmental interests.

- *The Social Licence to Regulate: Energy and the Decline of Confidence in Public Authorities*, Michael Cleland in collaboration with Laura Nourallah, 2015

Consumer Confidence Should be a Core Consideration

So what type of process is more likely to develop confidence?

Steps to Develop Consumer Confidence

- **Evidence based** assessment of the likelihood and magnitude of the risk
- Robust consideration of **alternatives**
- Multiple mechanisms for consumers and community **engagement** and relationship building
- Confidence that estimates are reliable and that expenditures are **prudent** yielding a **sustainable** net public benefit (economic, social and environmental)
- Consideration of **Intergenerational** Equity
- Confidence that everyone is paying their **fair share**

Steps to Undermine Consumer Confidence

- Deny a participatory voice in deliberations
- Scare tactics
- Cost “guestimates”
- Using resiliency and reliability as “cover” for other objectives

Consumers Need Specifics

The apparent increase in extreme weather events…the 100-year event which may in fact be happening more frequently

- CAMPUT 2016 - Session 8: Ensuring Resiliency of the Grid

The threat of severe weather **seems to grow** every season . . .

- *Developing a Resilient, Diverse Electricity System: The NARUC Perspective*, 2014

Which Risks are Significantly More Likely and Where?

- Scientists are ***highly confident*** that across most of the United States, the heaviest rainfall events have become more intense and frequent, especially in the Midwest and Northeast, and that the **frequency and intensity of extreme rainfall events** will further increase in the future for **most areas** in the United States.
- Scientists have ***medium confidence*** that **winter storms have increased slightly** in frequency and intensity.
- Scientists have ***medium confidence*** that **hurricane intensity** and associated heavy rainfall will continue to increase under a changing climate, but significant uncertainties remain.
- Scientists have ***low confidence*** in projections of trends in severe storms, including the intensity and frequency of **tornadoes, hail, and damaging thunderstorm winds.** This is in part due to a lack of long-term and the fact that such small and often remote storms are difficult to monitor and model.
- Scientists have *high confidence* that there have been regional trends in floods. However, scientists have ***low confidence* of future changes in flood frequency and intensity,** because the causes of regional changes are complex.
  - *Understanding the Link Between Climate Change and Extreme Weather* – United States Environmental Protection Agency, 2016

Topology Matters (Canada)

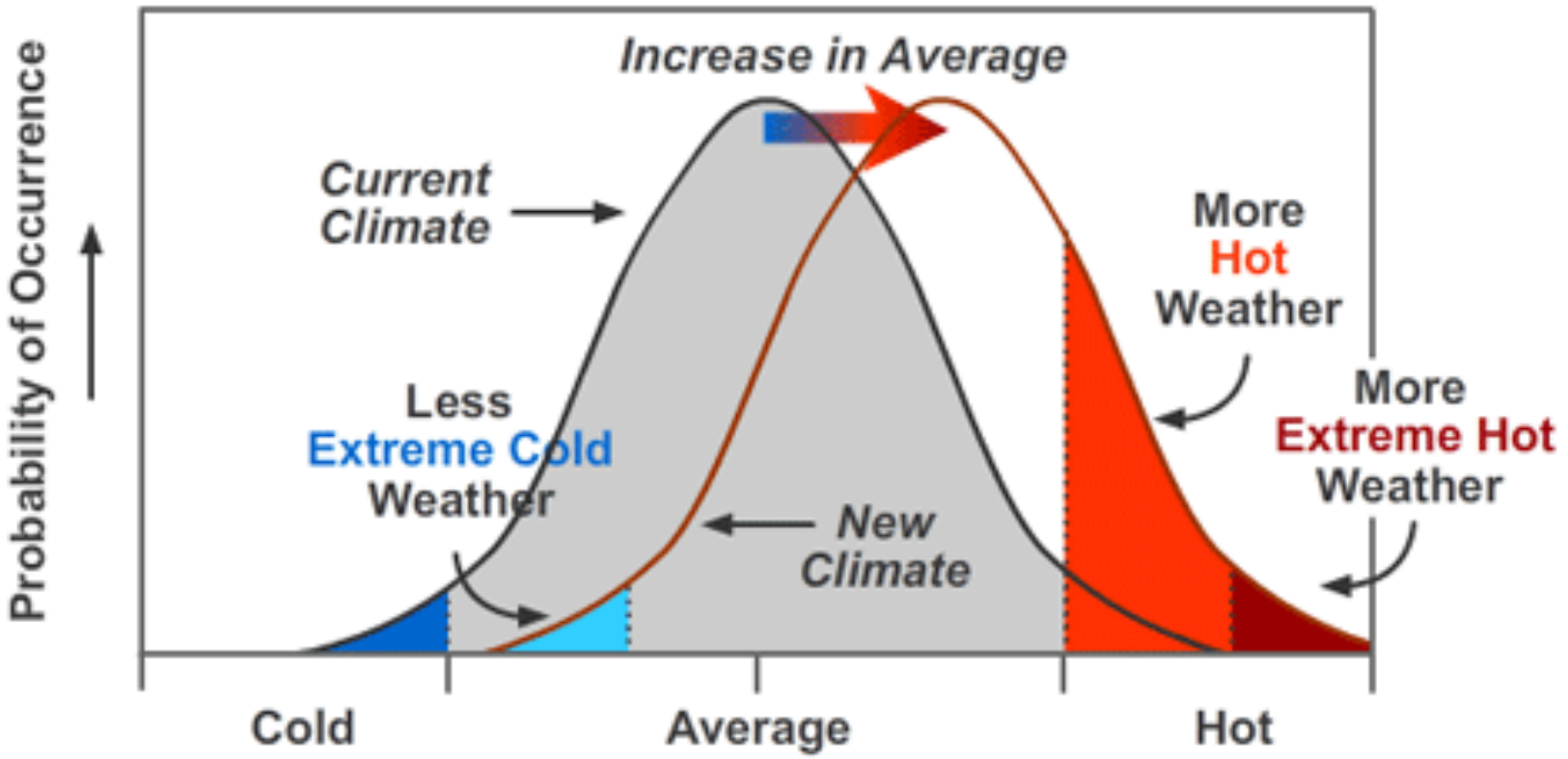
Analysis to infer changes in the one-in-20 year extremes indicates that extreme minimum temperatures have warmed more than extreme high temperatures, and that the **trends have been much stronger in the Canadian Arctic** than in southern Canada (Wang et al., 2013).

- *Canada in a Changing Climate: Sector Perspectives on Impacts and Adaptation* - Natural Resources Canada, 2014

With respect to extreme precipitation in Canada. . . **the results show patterns similar to earlier findings, with no consistent change in extreme precipitation for Canada as a whole.** On a continental scale, while various indices of heavy precipitation have been increasing since 1950, the **patterns have not been spatially uniform** across North America (Peterson et al., 2008). Increasing trends in precipitation intensity have been observed over about two-thirds of the northern hemisphere land area with sufficient data coverage for analysis (Min et al., 2011).

- *Canada in a Changing Climate: Sector Perspectives on Impacts and Adaptation* - Natural Resources Canada, 2014

Confidence Levels Assist Our Clients



Understanding the Link Between Climate Change and Extreme Weather – United States Environmental Protection Agency, 2016

Evidence Based Assessment

- Don't scare consumers - inform them
- Remind consumers we are speaking of probabilities not certainties
  - We are talking about probability distribution that has likely shifted upward (toward a greater likelihood of extreme events) rather than any deterministic model
- Move from the general to the specifics of our communities and our topology
- Confidence levels can be an important guide to informed risk tolerance

Confidence in Adequate Consideration of Alternatives

Requires transmission planning at the regional level to consider possible transmission **alternatives** and produce a regional transmission plan

- *Order No. 1000: Transmission Planning and Cost Allocation by Transmission Owning and Operating Public Utilities* - Federal Energy Regulatory Commission, 2011

Including non-transmission solutions

- account for existing and planned **energy efficiency** and **distributed generation** throughout the region that reduce load forecasts and in some cases, avoid or delay new transmission,
- **consider alternatives to transmission lines** that may defer or avoid the need for new transmission, including demand response, new energy efficiency, energy storage and/or distributed generation
  - *Sustainable FERC Project: Transmission Planning* - Federal Energy Regulatory Commission, 2013
  - *Sustainable FERC Project: Non-Transmission Solutions for Grid Problems* - Federal Energy Regulatory Commission, 2013

Our Clients Relate to Probabilistic Alternative Analysis

Reliability evaluation using a probabilistic approach . . . provides a **set of indices** which **can be objectively defended** before regulatory bodies, stakeholders, and customers since they can be reproduced and interpreted in decision making process thus eliminating subjectivity or preferences in choosing a project.

- *A Study on Probabilistic Risk Assessment for Transmission and Other Resource Planning* - Eastern Interconnection States' Planning Council, 2015

By explicitly incorporating probabilities into outage scenarios, probabilistic methods give decision makers much **clearer information** when **making tradeoffs between reliability and economics.**

- *Modernizing America's Electric Grid: Solutions for Transmission, Storage, Distribution & Resilience* – National Electrical Manufacturers Association, 2014

Avoiding a Robust NFAT is not Recommended

There is **very limited consumer involvement** on the front end of transmission projects

- *Written Evidence of the Ratepayer Group* - before the Alberta Utilities Commission, September 2015

With respect to Need, the **Government mandated the need** for certain Critical Transmission Projects through legislation. These projects were large and expensive.

- *Written Evidence of the Ratepayer Group* - before the Alberta Utilities Commission, September 2015

Avoiding a Robust NFAT may be Counterproductive

And Can Lead to Ongoing Controversy

- The Chairman is **hopeful** that both capital projects will be **subjected to a full [NFAT]** hearing.
  - Manitoba Public Utilities Board - Order 5/12
- The terms of reference **did not include** conducting assessment of the "need for and alternatives to" **[NFAT]** the Project.
  - *Bipole III Transmission Project: Report on Public Hearing* – Manitoba Clean Environment Commission, 2013
- Approximately $1.2 billion has already been spent on the Keeyask Project. The $3.2 billion Bipole III transmission line**, which was not subject to the NFAT Review,** has already received regulatory approval and will be constructed to carry northern electricity to southern Manitoba. Both of these were treated by Manitoba Hydro as **"sunk costs"**, and therefore **excluded from the economic analysis**
  - *Needs For And Alternatives To (NFAT) Review of Manitoba Hydro's Preferred Development Plan: Final Report* – Manitoba Public Utilities Board, 2014
- New Manitoba Government identifies Bipole III Review as one of their top priorities.
  - *PCs set out first 100 days of change for a better Manitoba* - Progressive Conservative Manitoba, April 13, 2016
  - No horning in on Hydro: Tories - Winnipeg Free Press, May 13, 2016

Multiple Levels of Engagement over the Long Term

- early engagement – in community
  - community meetings
  - Nation to Nation relationship building
- multiple methods of participating in hearings
  - on line comments
  - in person presentations
- full participation rights in hearings
- ongoing, independent, qualitative and quantitative consumer research

Are Expenditures Prudent, Sustainable and in the Public Interest?

Ensure that utilities develop **reasonable and prudent programs** to plan for major outage events **without the hype and fear.**

- *Making the Grid More Resilient within Reason* - Synapse Energy Economics, 2014

As always, the test is whether the cost incurred are **prudent.** If there is evidence that increased resilience is in the consumer/public interest, then the cost can be included in rate base and revenue requirement.

- Dr. Roger Higgin - personal communication, April 2016

Net positive contribution to **sustainability** in "**Next Generation**" environmental assessment

Avoiding "Guestimates"

Ratepayers **should not have to bear the risk** of contingency estimates; otherwise, companies will have less incentive to manage costs.

- *Making the Grid More Resilient within Reason* - Synapse Energy Economics, 2014

Progression of Capital Cost Estimates: Bipole III Transmission			
CEF 2007	CEF 2010	CEF 2013	CEF 2014
$2.2 B	$3.3 B	$3.3 B	$4.6 B

Manitoba Public Utilities Board - Order 73/15, p. 59

Consider Intergenerational Equity

Depreciation

- Should resiliency investments lengthen expected service lives?
  - *Written Evidence of the Ratepayer Group* - before the Alberta Utilities Commission, September 2015

Deferral Accounts

- The revenues generated from a 2.15% rate increase are to be placed in the previously established deferral account to **mitigate rate increases** when the Bipole III Transmission Reliability Project (Bipole III), . . . comes into service in 2018/19. Because very significant rate increases will be needed at that time, the Board sees a compelling policy reason to **gradually increase rates** to avoid rate shock for consumers **three years from now.**
  - Manitoba Public Utilities Board - Order 73/15

Fairness Among Consumers is Easier Said than Done

Some have more optimism

- The cost of transmission solutions chosen to meet regional transmission needs to be allocated fairly to beneficiaries.
  - *Order No. 1000: Transmission Planning and Cost Allocation by Transmission Owning and Operating Public Utilities* - Federal Energy Regulatory Commission, 2011
- Commercial and industrial customers, for example, could lose a considerable amount of business from a prolonged outage and **may be more willing to pay for system hardening.**
  - *Developing a Resilient, Diverse Electricity System: The NARUC Perspective* – Colette D. Honorable, 2014

Fairness Among Consumers is Easier Said than Done

Some have less confidence

- Winter peak demand of **residential customers drives allocation** models for **transmission**
- Absent market driven choices, it is **extremely difficult to differentiate** between the **value** different consumers and different classes of consumers place on reliability and resiliency
- **Residential consumers will always pay** whether as ratepayers, consumers of goods and services or taxpayers
  - Ms Gloria Desorcy, CAC Manitoba, personal communications, May 2016

Is there Consensus that Ratepayers Should Pay?

Despite agreement around the benefits of investing in the grid, **Americans are divided over** who is primarily responsible for actually investing in it

- *The Economic Case for Grid Investment* - ITC, 2014

Many consumers view **reliability as "table stakes"**—that is, utilities ought to be **investing in reliability without additional charges** flowing through to consumers

- *2014 State of the Consumer Report* - Smart Grid Consumer Collaborative, 2014

The Case for Collective Interest in Grid Resiliency

- The principal resources on which **Québec society depends** are drinking water, **electricity**, food, telecommunications, health care, emergency services, financial services and transportation. Our **essential systems** are those that produce, supply and distribute essential resources. The **interdependence** of these systems **heightens** their **vulnerability** to hazards of all kinds, including those resulting from climate change. The **Government must ensure** the constant availability of essential resources to the population. Since the provision of these resources depends on the proper functioning of essential systems, and the latter are vulnerable to so many hazards (in large part because of their interdependence), it is **imperative** that we **improve their resilience**.
  - *Quebec in Action: Greener by 2020* - Government of Quebec, 2012
- Security of supply impacts all consumers regardless of consumption
- Charging consumers based on electricity usage means **we pay inequitably**, because of substandard housing conditions, where we live (all electric). When we pay taxes, we pay based on income and ability to pay.
  - Ms Gloria Desorcy, CAC Manitoba, personal communication, May 2016

Thank you

"Grid resiliency investments are and will be important. That said, utilities should not be able to "stoke the fears of power disruption"

-*Making the Grid More Resilient within Reason* - Synapse Energy Economics, 2014