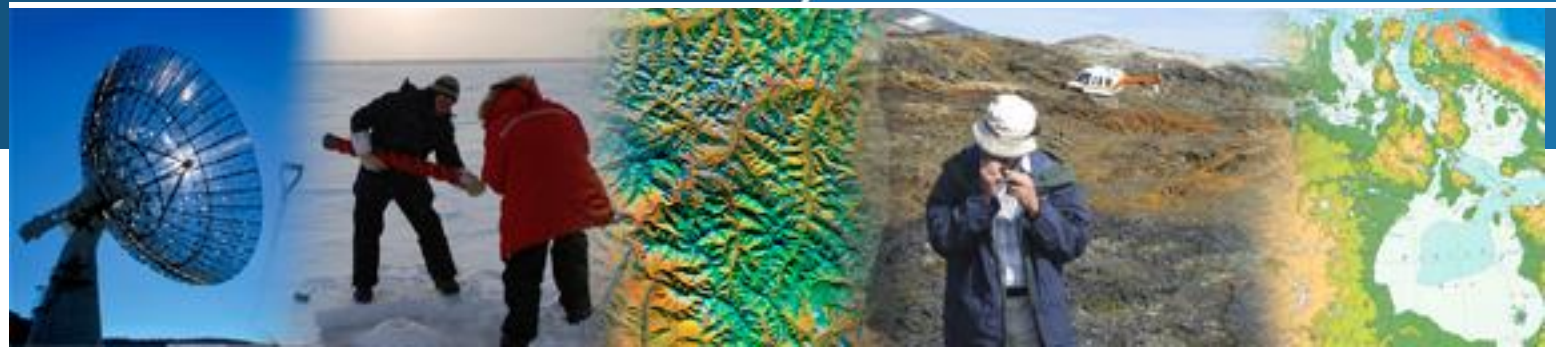
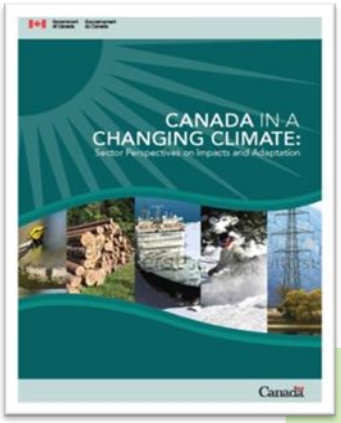


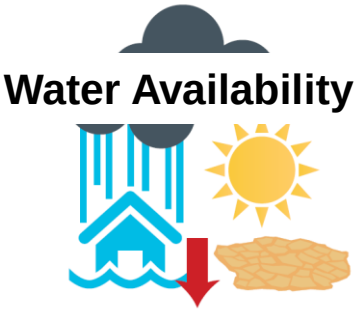
Canada's Adaptation Platform Experience - Enhancing Energy Sector's Resilience to Climate Change

IEA's Climate-Energy Security Nexus, November 4, 2014

Mary-Ann Wilson, Program Manager
Chair, Energy and Adaptation Working Group
Climate Change Impacts and Adaptation Division (CCIAD)
Natural Resources Canada

Climate Change Impacts on the Energy Sector





DEMAND	Increased peak electricity demand due to heat waves	Increased total cooling demand; Decreased heating demand	
SUPPLY	Damage to onshore and offshore production facilities	More resource development in arctic (less sea ice)	(+/-) Hydropower production; Thermo-electricity limited; Less water for oil and gas production
TRANSMISSION	Infrastructure damage due to landslides, ice storms, etc.	Reduced efficiency electricity transmission; Infrastructure damaged by permafrost thaw	

Collaboration is essential - need to work with public and private sector and many networks

- Climate change impacts cut across geographic and sectoral boundaries - requires cooperation across regions, disciplines and organizations
- Decisions driven by local or industry needs are affected by policies, programs, regulations and legislation from all levels of government
- Involvement of a variety of interests helps ensure technical, economic and environmental soundness and sustainability
- Significant "investment" of time and resources - yields dividends
  - efficient use of resources
  - sharing of data, expertise, experience
  - building new understanding and synergies

Adaptation Platform

Enhancing collaboration to position regions and economic sectors to adapt to climate change

Plenary

Senior-level:

- Provincial/Territorial, governments
- federal departments
- local government association
- professional organizations
- industry associations

Working Groups

- Mining
- Energy
- Forestry
- Science assessment
- Coastal management
- RAC/Tools synthesis
- Water and climate information
- Northern
- Infrastructure
- Measuring progress
- Economics

Identifies opportunities for action in priority areas

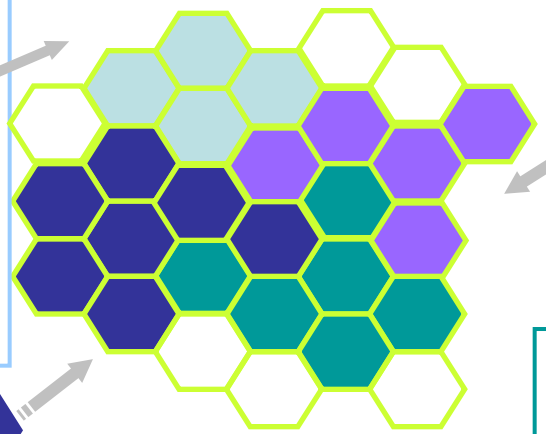
Diverse experts and end-users collaborating on new products, approaches and tools to support decision-making

Energy Working Group

Objective: to increase resilience of energy sector to climate change

Priorities: mainstream adaptation into decision-making, develop information and tools, and disseminate knowledge

Professional and Other Organizations
Canadian Institute of Chartered Accountants, Engineers Canada, Ouranos



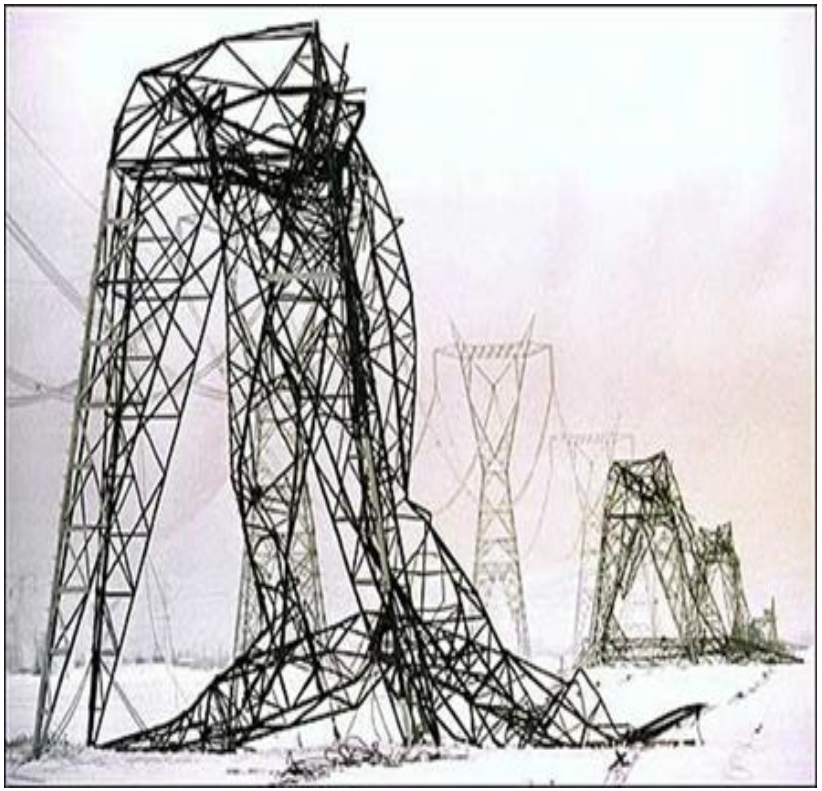
Federal Departments
Natural Resources Canada, Transport Canada, Health Canada, Aboriginal Affairs and Northern Development Canada

Provinces/Territories
British Columbia, Alberta, Saskatchewan, Ontario, Nova Scotia, Newfoundland, Yukon

National Associations & Industry
BC Hydro, SaskPower, Manitoba Hydro, Ontario Power Generation, Hydro Quebec, Canadian Electricity Association , Independent Electricity Systems Operators

Energy Working Group Activities

- Produced state of adaptation in Canada's energy sector report
- Developed Program of Work which identified needs for energy and adaptation including:
  - Climate and Hydrology Information
  - Risk Assessment
  - Best Practices & Tools
  - Business Case
  - Policy Drivers and Barriers
  - Awareness and Action
- Over 20 targeted knowledge and tools projects
  - eg. guides, tools, case studies, reports
  - > 140 organizations involved

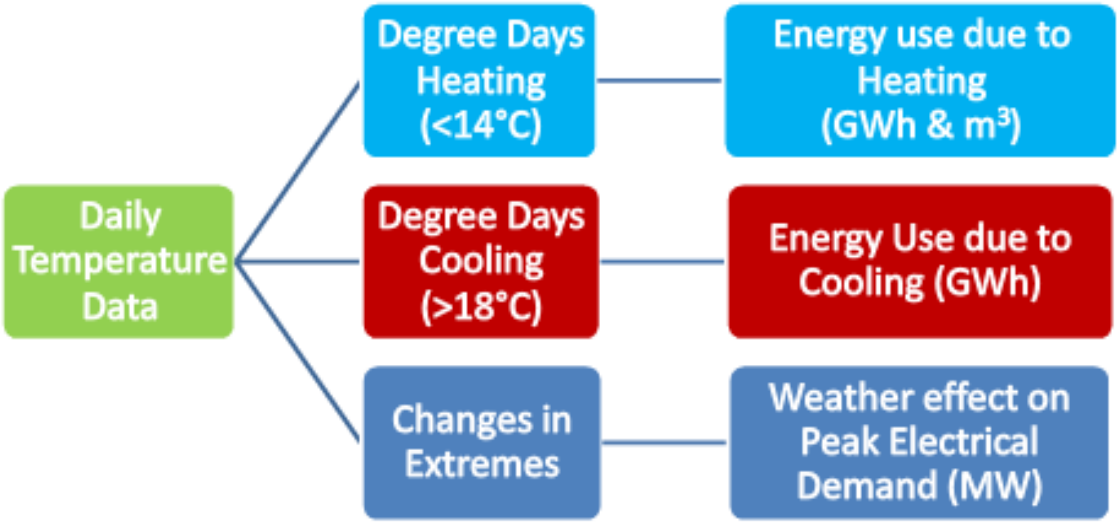


Climate Change Temperature Impacts on Energy Demand

- This collaborative project examines how demand for heating and cooling will change within the next 30 years as a result of the warmer winters and hotter summers projected by climate scientists

- Looks at how deviations from the normal, observed temperature averages impacts demand for energy across all of Canada and across regions and, in some cases, looks at implications for projecting energy supplies

Methodology



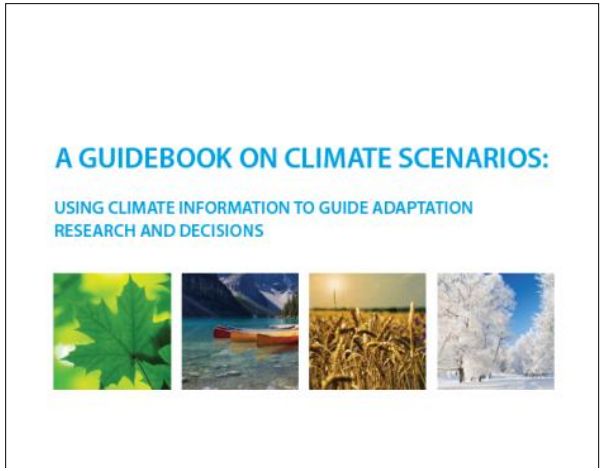
Climate Scenarios Guide

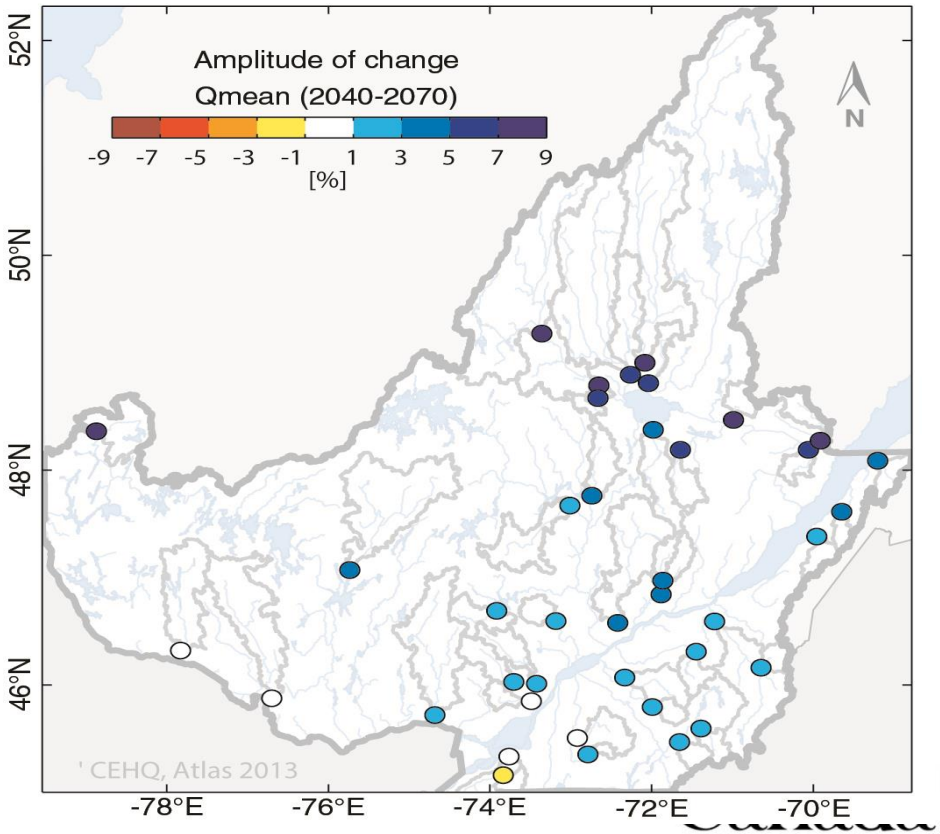
- Targeted to decision-makers of different levels of expertise

- Describes different types of information and ways to present
  - simple, intermediate and detailed – will depend on use

- Outlines the different sources of uncertainty and allows users to become more critical of the information provided to them

http://www.ouranos.ca





Tools

Public Infrastructure Engineering Vulnerability Committee (PIEVC) Protocol

- Engineers Canada with many partners
- 5 step guide to assess infrastructure current and future climate risks

http://www.pievc.ca/

Probable Maximum Precipitation and Maximum Flood Projections under Changing Climate Conditions - Climate Change Proof Dam Safety Assessments

- Developing method to integrate climate change precipitation into hydroelectricity management and dam safety

Policies Drivers and Barriers

- Affects all business areas eg. planning, operations, management, business continuity
- Need to “mainstream”
- Decision-making continuum
- Time horizon influences
- Application of policies
- Role – public, private, consumer

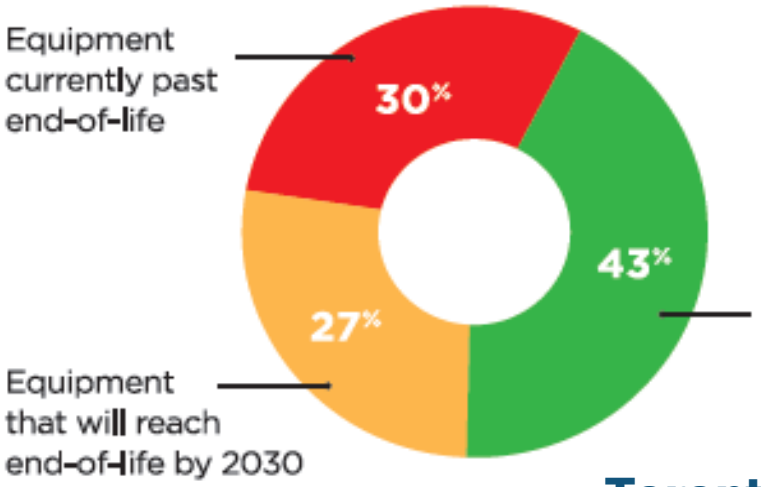
Building the Business Case

Canadian Electricity Association

- National project to assess climate change impact on projected investments required for Canada's electricity infrastructure system estimated at $350 billion to 2030*.

Toronto Hydro

- Vulnerability assessment ($2.8B in assets) to manage risk and build business case for rate increases (2 extreme events in 2013 with outages)



Business

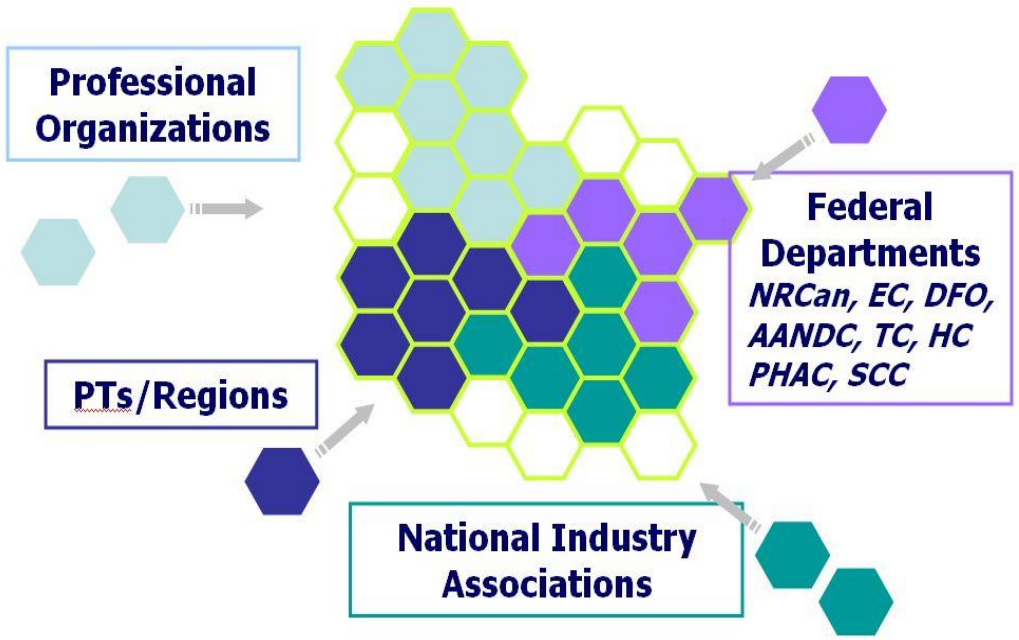
Toronto Hydro seeks 2.5-per-cent rate hike to renew aging system

Utility's customers will be asked for a healthy rate hike to renew its infrastructure, which needs to be able to withstand extreme weather.

Toronto Hydro's Aging System

*Conference Board of Canada

Canada's Adaptation Platform



Benefits….
Collaboration
Targeted knowledge and tools
Sharing Information

Approach enhances sharing information eg.

- Top-down/ bottom-up
- Increase "buy-in"
- Peer-to-peer
- Across sectors, jurisdictions and regions
- Target dissemination

THANK-YOU ***Mary-Ann.Wilson@nrcan.gc.ca***