The energy sector is of particular importance for Canada, with yearly exports valued at about $100 billion. Many components of the energy sector value chain are sensitive to weather and climate conditions: natural resource endowment for renewable energy production (such as river runoff, wind and solar radiation), thermal power generation, power transmission and distribution as well as customer demand. As such, the energy sector is increasingly concerned about the impacts of climate change on its activities. Utilities, regulators and governments around the world are taking future climate risks into consideration while meeting existing challenges, in order to take appropriate robust and cost-effective measures. However, examples of how to effectively incorporate climate change in the decision making process in this sector are rarely well documented.

**Objective**
Document and assess energy sector initiatives aimed at building climate change resilience and measuring climate change vulnerability, risk, opportunity and adaptation. Understand how climate information can support decision-making for stakeholders in the energy sector.

**Methodology**
- Identify adaptation measures through a review of scientific publications, reports, trade journals, corporate annual reports and interviews with energy sector experts;
- Prioritize adaptation measures by means of a survey;
- Document best practices based on interviews with the personnel responsible for their application.

**Reference**
ADAPTATION CASE STUDIES IN THE ENERGY SECTOR: OVERCOMING BARRIERS TO ADAPTATION

RESULTS

More than 200 examples of adaptation to climate change in the energy sector were identified around the globe. The number and diversity of companies and organizations involved suggest that climate change adaptation activities are becoming increasingly mainstream.

Of these 200 examples, 11 were selected on the basis of relevance to the Canadian energy sector in order to obtain a more detailed documentation of the motivations, sequence of actions, mechanisms and results of the adaptation projects. Semi-structured interviews were conducted with representatives from each organization to learn more about the context, challenges, benefits and resources needed for adaptation, among other things.

The interviews revealed a number of barriers to adaptation, such as level of understanding and perception of climate change impacts, a lack of rationale for adaptation investment, poor communication between players, a lack of technical guidance, insufficient institutional support, inadequate leadership, inaccessibility of specific climate data and services, the absence of collaboration, climate projection uncertainty and the need to adapt existing tools.

Case study 1 – Protecting assets against an increasing risk of flood
Case study 2 – Fine-tuning observations to better manage and design hydroelectricity assets
Case study 3 – Strategic approach to climate change resilience
Case study 4 – Climate Change Assessment for Hydropower Project Licensing
Case study 5 – Storm hardening in a climate change context
Case study 6 – Engaging the public in climate resilience
Case study 7 – New climate normals for electricity demand forecasting
Case study 8 – Cooling for thermal generation in a changing climate
Case study 9 – Adapting to reduced equipment thermal ratings
Case study 10 – Increasing network resilience with specialized weather forecasts
Case study 11 – Using climate change risk assessment wisely

Despite these obstacles, the case studies clearly show that the implementation of climate change adaptation often creates beneficial synergies for the organization. By sharing the advances made by the energy sector, this project seeks to stimulate the development and implementation of adaptation measures and to paint a picture of the benefits and obstacles to their implementation. It is important to identify the challenges because, in the words of one of the interviewees, "Even if you don’t adapt now, then you need to know why."

BENEFITS FOR ADAPTATION

- The documented case studies will help to disseminate and transfer information, engage decision makers and better recognize barriers to adaptation within the energy sector in order to overcome them.
- The project also contributed to the identification of climate information needs in the energy sector and to a better understanding of the barriers and drivers for the application of this information.