QUEST

Municipalities and Utilities Partnering for Community Resilience

Lessons Learned Webinar

February 20, 2020

About QUEST

- QUEST is a national non-government organization that drives the development of resilient, affordable, healthy, and prosperous Canadian communities by building awareness of, and support for, efficient, integrated, and localized energy systems

- Our vision is Canada as a nation of Smart Energy Communities

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What is a Smart Energy Community?

- A Smart Energy Community is one that:
  - Recognizes the reality of community energy needs and priorities
  - Integrates local, renewable, and conventional energy sources
  - Efficiently, cleanly, safely, and affordably meets its energy needs
  - Understands the compelling challenge of climate change

Smart Energy Communities are an essential foundation for effective energy and climate policy

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Agenda

Project overview

Key lessons learned

Key challenges

Key benefits for participating communities

Conclusion

Q&A

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Project partners

Initiative funded by

FCM FEDERATION OF CANADIAN MUNICIPALITIES FÉDÉRATION CANADIENNE DES MUNICIPALITÉS

Natural Resources Canada Ressources naturelles Canada

Canada

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Project overview | Project methodology

Phase 1: A climate risk and vulnerability assessment stage

- Survey, Climate Data collection
- Interactive workshop #1 engaging key stakeholder groups with tabletop discussions, self assessment, and mapping exercises
- *Climate Risk and Vulnerability Assessment Report*

Phase 2: An action-oriented stage

- Interactive workshop #2 with same stakeholders to select place-specific recommendations and prioritize them
- *Resilience Recommendation Report*

Phase 3: Networking and knowledge exchange

- Monthly calls meeting with project team to share initiatives and questions
- Delivery of three webinars

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Project overview | Project methodology

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Project overview | A timely project

Climate Change Impacts is a reality for Canadian Communities

Both hydrological and atmospheric hazards pose significant risks to municipal infrastructure as well as energy distribution systems, continuity of essential services, not to mention impacts to private property, public health and safety, and the local economy.

Darlings Island, N.B. May 2018 Andrew Vaughan / THE CANADIAN PRESS file photo

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Project overview | A timely project

Municipalities in Canada are starting to adapt to climate but lack resources

- Participating municipalities are conducting adaptation initiatives.
- The degree of progress on climate adaptation vary from a municipality to another.
- Municipalities have limited human and financial resources.
- QUEST's project helped inform the development and preparation of Climate Adaptation Plans, and to embed recommendations in Emergency Plans, Land Use Plans, Asset Plans, etc.

There is a significant gap between what the municipality is aiming for and is willing to do, and its actual capacity to act.

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Project overview | A timely project

A much-needed bridge to be built between municipalities and energy utilities

- Energy utilities have started to implement adaptation measures. Some utilities are more advanced than others.
- Municipalities interested in learning about their local energy systems in relation to climate change and informing community energy plans
- Energy utilities interested in listening to the needs of municipalities and help them inform their local adaptation and resilience efforts.

The project confirmed the need for regular collaboration between municipalities and utilities to improve resilience.

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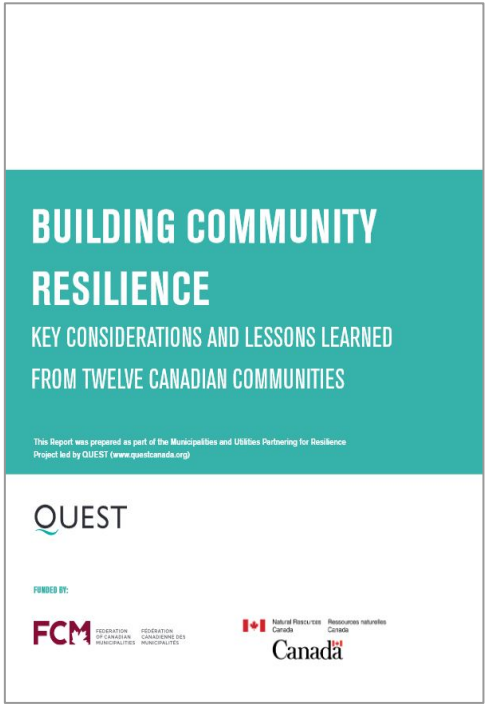
Project overview | Lessons Learned Report

Key lessons learned from the participating municipalities and their energy utilities including:

- Municipalities' most common strengths and vulnerabilities to specific climate hazards
- Key recommendations to advance climate adaptation, strengthen the resilience of energy systems, and augment emergency preparedness plans
- Major challenges to the development and implementation of climate adaptation measures



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Common Strengths

Key lessons learned | Municipalities' Common Strengths

Category	Description
Emergency plan	• Emergency plans in place and regularly reviewed. • Most communities exercise their plans once a year • Starting to integrate climate hazards
Coordination & communi--cation	• Mayor and Council understand their roles and responsibilities • Informal alliances with neighboring communities and local suppliers – in some instances formalized MOUs or Standing Agreements • Public alerting networks exist, but can be improved • Most municipalities have a communication plan for promoting emergency preparedness. However, proactive education and public engagement can be improved.

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Key lessons learned | Municipalities' Common Strengths

Category	Description
Energy resilience	• Stationary and mobile back-up power on most of essential facilities • Most municipalities identified alternate sources of fuel (for generators) • Risk prevention to conventional hazards is high (e.g. tree trimming) • All communities have a contact tree (but may need to be updated) • Half of the communities have a Community Energy Plan, and identified opportunities to improve efficiency and develop local energy sources.

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Key lessons learned | Municipalities' Common Strengths

Category	Description
Land-use, planning, and asset management	• Increased considerations for climate change in land-use planning documents and Asset Management Plans during updates/reviews • Awareness of the role of natural assets, for e.g. natural buffers, retention ponds / greenspace, to reduce stormwater runoff • Most municipalities have separated or mostly separated stormwater and sewer systems (may not handle 1 in 100 year flood events)

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Common Vulnerabilities

Key lessons learned | Municipalities' Common Vulnerabilities

Category	Description
Energy infrastructure	• More communication with utilities on areas to prioritize for restoration. • Reliance on main grid (no alternative local generation sources). • Community Energy Plans identify opportunities, but barriers remain • Municipally owned utilities need particular measures • Not enough public education on emergency plans and shelters, the do's and don'ts during power outages, etc • Missing back-up power for some key infrastructures (e.g. shelters, lifts) • Collaboration between municipalities and utilities can be improved • In some cases, no alternate sources of fuel (for generators) identified • Key suppliers (e.g. fuel stations, grocers) don't always have back-up

Key lessons learned | Municipalities' Common Vulnerabilities

Category	Description
Emergency Management (EM) Plans	• EM Plans need to better capture climate projections and climate hazards • Most municipalities did not have copies of EM Plans for local schools, hospitals or nursing homes, and are unaware of expectations. • Most municipalities do not have voluntary registry of vulnerable persons • No official cooling centers identified (for hot days / heat waves)
Water Infra--structure	• Partial separation of storm water and sewer systems • Underutilization of bioretention practices • Potential vulnerabilities to 1 in 100 year flood events and sea rise level, • Missing back-up (mobile) for lift stations, and reliable communication • Need for study water system reliability based on energy needs

Key lessons learned | Municipalities' Common Vulnerabilities

Category	Description
Communi--cation	• Lack of regular updates to council and during events. • Public education and communication can be more effective, especially on preparedness kits in case of prolonged power outages • Lack of regular community-wide training exercise, table top exercises • Lack of education/communication strategy targeted at vulnerable groups. • Improvements to communication system reliability - back-up, alternate systems : HAM Radio, Trunk Mobile Radio, Fiber, etc.

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Key lessons learned | Municipalities' Common Vulnerabilities

Category	Description
Planning	• Lack of integration, mainly due to the absence of a dedicated task-force • Key planning documents do not always incorporate climate risks • Underutilization of Natural Asset Management approach • Key infrastructure located in flood risk zone need funding for adaptation. • Land-use planning and development standards/bylaws needed in flood zones • Lack of training for all municipal staff on ICS and climate adaptation • Most communities do not have an inventory of skills and resources

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Lessons learned from energy utilities

Key lessons learned – Energy Utilities' initiatives

Learning from past extreme weather events. Recording lessons learned from past emergency events | Strengthening communication and relationships with key stakeholder groups | Hardening their infrastructure and assets | Development of mutual aid agreements | Improved outage detection, response and recovery.

Gathering and analysing real time data through automated system. Installation of new systems on substations, feeders, and transformers in order to detect, map, and track outages in real time. Some AMI.

Adapting business and operations to municipalities and customers' demand for more local and reliable energy systems. Utilities are developing programs, tools and other initiatives to help customers incorporate and/or access distributed energy sources.

Informing the public on Emergency Plans. More proactive on public education | Dedicated websites or webpages.

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Key lessons learned – Utilities' Areas for Improvement

- **Be more proactive in working with municipalities**
  - Identify local risks and align asset management and emergency management plans
  - Support community energy projects
  - Involve municipalities in restoration and preparedness plans and exercises
  - Improve flood response
- **Conduct vulnerability assessment and integrate them in planning strategy**
  - Undertake full assessment of flood risk (1 in 100 year and 200 year events) and sea rise level | Identify and prioritize potential relocations of energy assets and infrastructures. Explore options for back-up of municipal CI (beyond the meter).

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Key Challenges – Municipalities

Lack of financial resources for proactive action

- Limited municipal financial resources
- “Who pays for what? ”.
- Limited and insufficient federal and provincial funding sources for proactive adaptive measures.
- A saturated funding landscape.

Lack of human resources and organizational challenges

- Integrating climate adaptation in existing municipal structure and processes.
- Staff capacity and retention.

Lack of alignment between the three levels of government.

- Clarify responsibilities among levels of governments
- Then, what? Supporting business and land-owners

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Key Challenges – Energy Utilities

Dealing with uncertainty

- difficult to anticipate the number of storms that will impact energy infrastructure and the damage they will create

Covering for increasing costs: reserve fund, raising rates, or cuts?

- Limited funding mechanisms for preventive adaptation measures and restoration for non-profit utilities and regulated corporation
- Insurance costs

Improving real time grid monitoring & management

- Effort to invest in real time monitoring but still high reliance on customers to report outages and on crews to determine size and impacts of damages

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Project overview | Key benefits for municipalities

Inclusivity and engagement: a collaborative approach to climate adaptation

- Breaking internal and external siloes
- Building bridges between municipal departments
- Engaging energy utilities.

During the workshops, the benefits of getting multiple internal and external stakeholders in one room to identify and prioritize emergency management as part of climate adaptation were very valuable, and allowed us to identify overlaps in what we are doing in emergency management and what we need in climate adaptation."

Nancy Weigel, Corporate & Strategic Services Director/Deputy CAO, The Town of Okotoks, Alberta

Project overview | Key benefits for municipalities

Building an integrated and systemic resilience approach

- Leveraging current municipal documents and governance processes.
- Incorporation of low-hanging fruit in the reviews and updates of existing municipal plans and in the development of climate action

"The two workshops provided an opportunity to review all the services in the city through a climate hazard lense and identify those which are vulnerable and/or need attention. … The report from QUEST is extremely well done and has been integrated into our Emergency Measures Organization (EMO) documents."

Bob Ashley, CAO City of Summerside, Prince Edward Island

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Conclusion

- Lessons Learned Report
- Community Resilience Mini-guide
  - Tips and resources for communities interested in becoming more resilient
  - Tips to develop an effective education communications plan
  - Possible funding strategies

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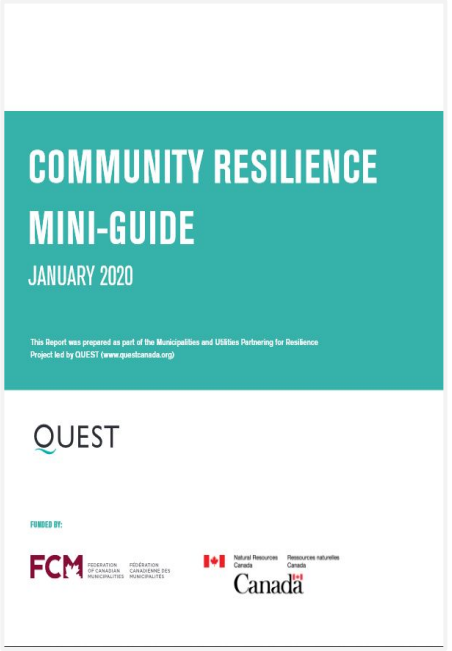

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Conclusion

- QUEST's Resilience and Community Energy Planning Advisory Services

ADVISORY SERVICES

QUEST supports governments, utilities & energy providers, the real-estate sector, and solution providers to grow the Smart Energy Communities marketplace with custom, trusted, and independent services.

ENERGY MAPPING WORKSHOPS

learn more +

COMMUNITY ENERGY PLANNING SUPPORT

learn more +

CUSTOM SERVICES

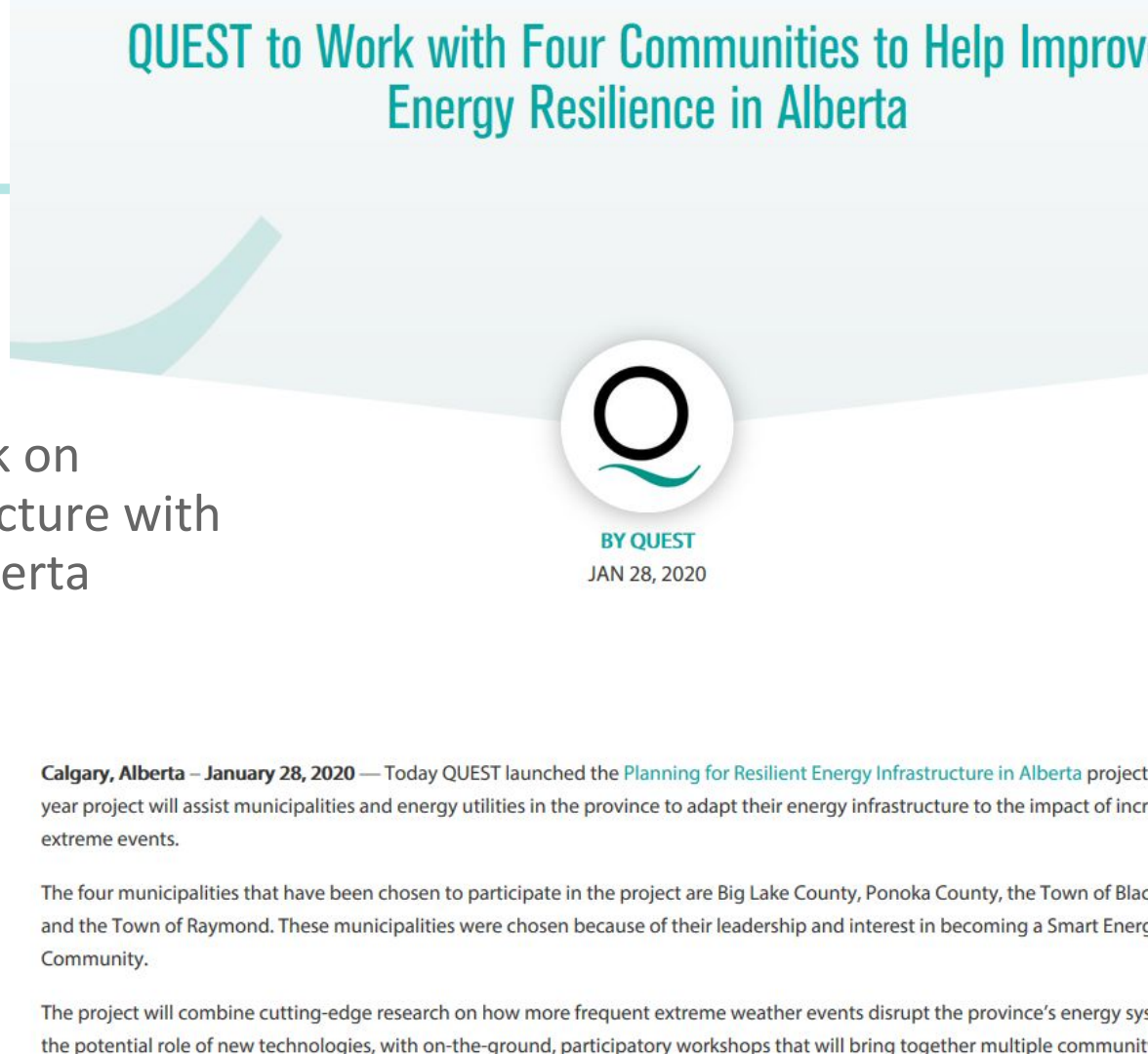
learn more +

RESILIENCE WORKSHOPS

learn more +

Conclusion

- QUEST continues to work on resilient energy infrastructure with four municipalities in Alberta



QUEST to Work with Four Communities to Help Improv
Energy Resilience in Alberta

BY QUEST
JAN 28, 2020

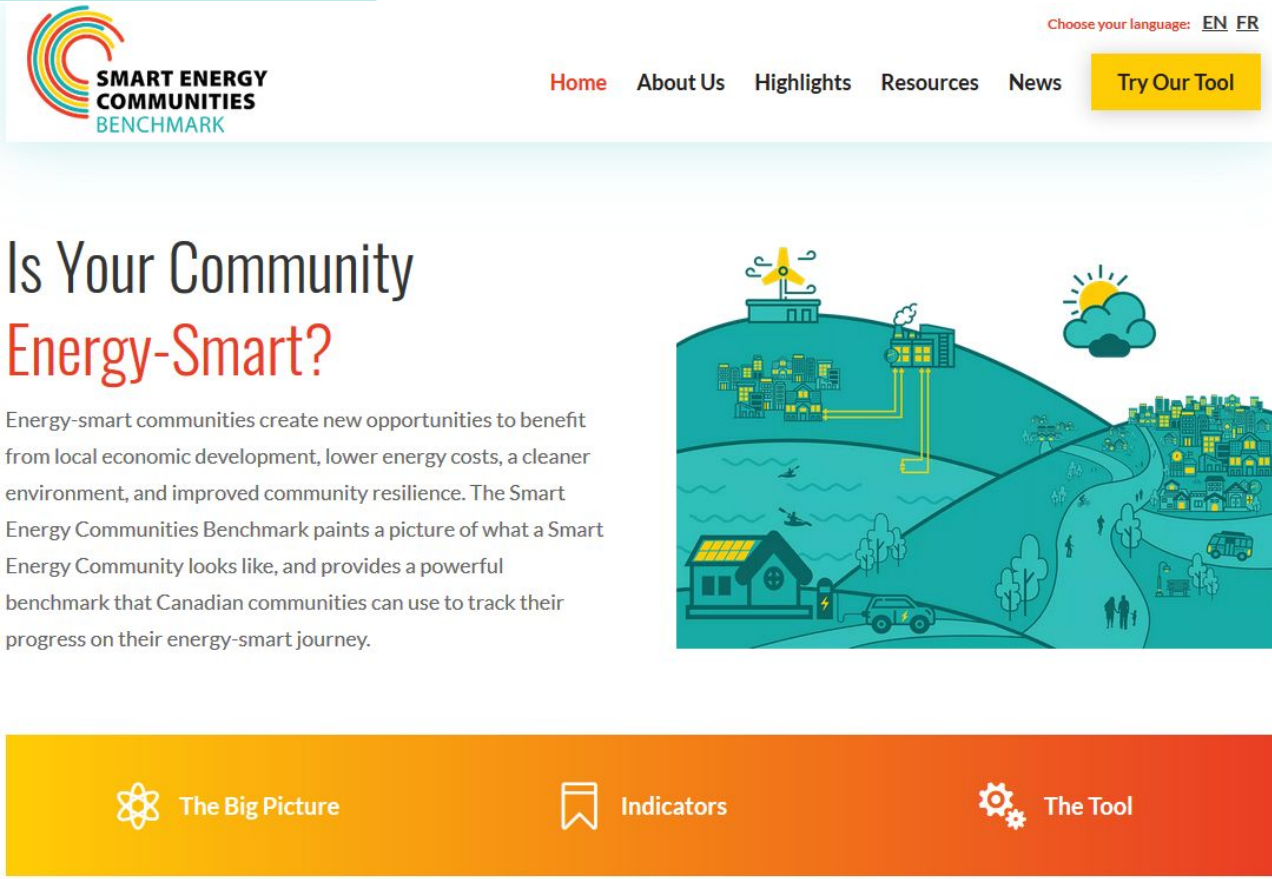
Calgary, Alberta – January 28, 2020 — Today QUEST launched the Planning for Resilient Energy Infrastructure in Alberta project
year project will assist municipalities and energy utilities in the province to adapt their energy infrastructure to the impact of incr
extreme events.

The four municipalities that have been chosen to participate in the project are Big Lake County, Ponoka County, the Town of Blac
and the Town of Raymond. These municipalities were chosen because of their leadership and interest in becoming a Smart Energ
Community.

The project will combine cutting-edge research on how more frequent extreme weather events disrupt the province's energy sys
the potential role of new technologies, with on-the-ground, participatory workshops that will bring together multiple communit

Conclusion

- The Smart Energy Communities Benchmark, a new tool for communities



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