

# Managing Risks through Sustainable Practices: Resources for Enhancing Disaster and Community Resilience

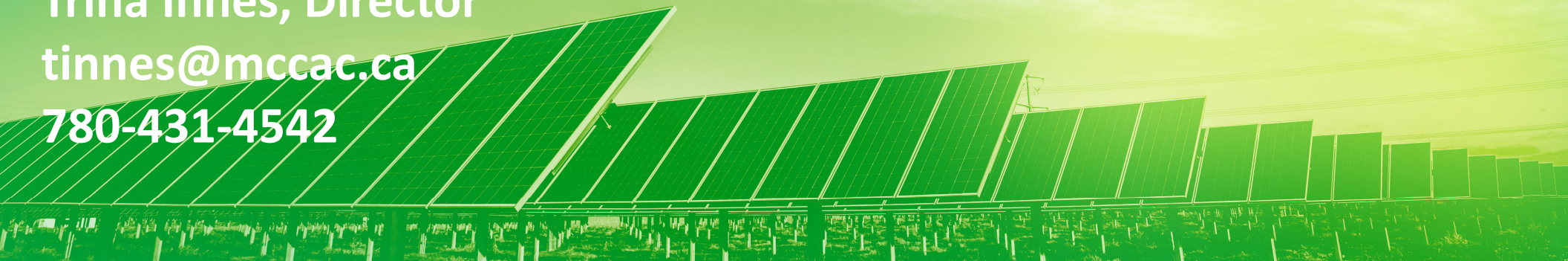
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Municipal  
Climate Change  
Action Centre

*2020 Emergency Management Stakeholder Summit*

Trina Innes, Director  
[tinnes@mccac.ca](mailto:tinnes@mccac.ca)  
780-431-4542



# A DECADE OF ACTION



**319** municipalities, schools, and community related organizations participated



**522** renewable energy and energy efficiency projects



**16,890** annual tonnes of GHG emissions (CO<sub>2</sub>e) avoided



**\$38 million** clean energy investments catalyzed



**341** full time jobs created



**10 MW** of solar energy installed



**\$2.4 million** in annual energy savings



Municipal  
Climate Change  
Action Centre



RMA  
RURAL MUNICIPALITIES  
of ALBERTA



2009 - 2019

# Weather



can change within  
a few minutes or hours!



# Climate



takes very long time  
to change!



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**When you think of climate change risks what comes to mind?**

▼

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# The Global Risks Report 2020

Insight Report | 15th Edition

In partnership with Marsh & McLennan and Zurich Insurance Group

Climate change is  
striking harder and  
more rapidly than  
many expected

Global Risks Report 2020



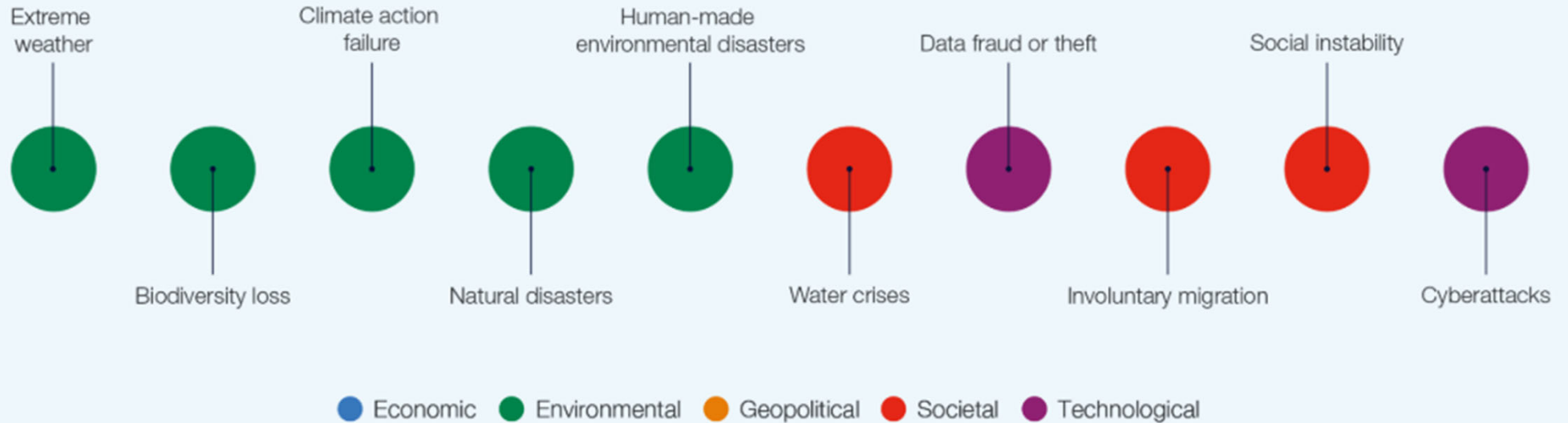
Source: <http://reports.weforum.org/global-risks-report-2020/>

TOP 10 RISKS OVER THE NEXT 10 YEARS

# Long-Term Risk Outlook: Likelihood



## Global Shapers

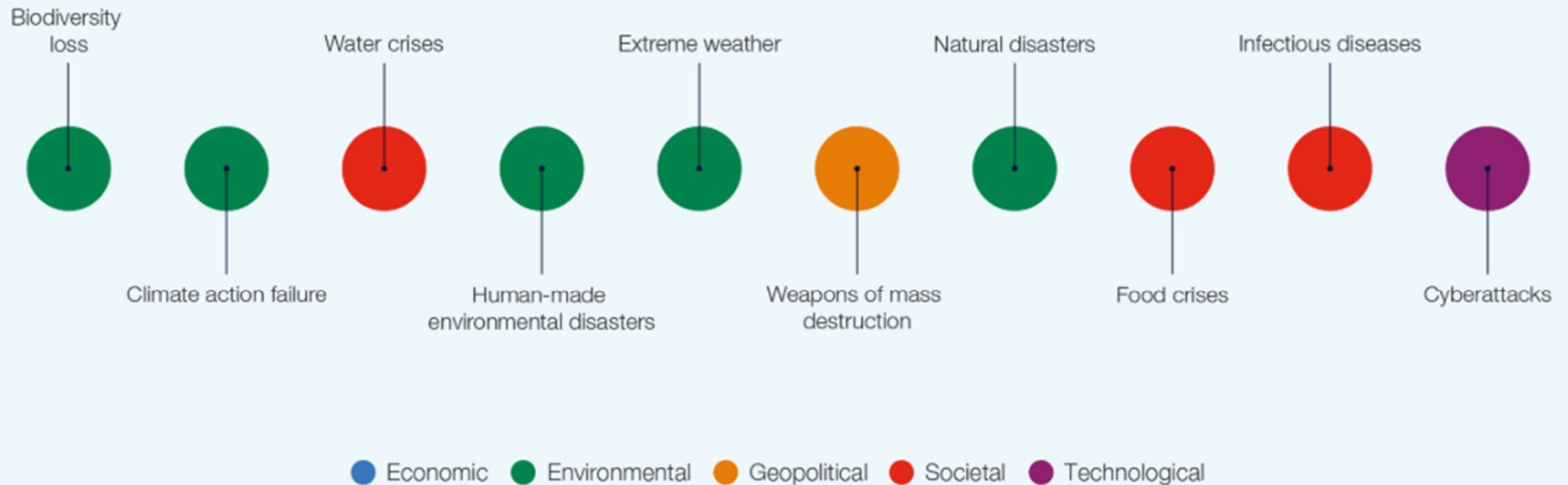


TOP 10 RISKS OVER THE NEXT 10 YEARS

# Long-Term Risk Outlook: Impact



## Global Shapers







CCCR2019

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# Canada's Changing Climate Report

This report is about how and why Canada's climate has changed and what changes are projected for the future. Led by Environment and Climate Change Canada, it is the first report to be released as part of *Canada in a Changing Climate: Advancing our Knowledge for Action*.

[Explore Chapters](#) ↓

[Download Full Report \(PDF, 34MB\)](#) ►



# #CCCCR2019



Expect more  
extreme weather



We're warming  
up, Canada



It's already happening,  
and will get worse



The icy North  
no more...



Canada is  
warming quicker



Mainly more precipitation,  
but also a risk of less



Our coastlines  
will change



Canadian oceans  
have changed



Future challenges to  
freshwater supplies



But we can still  
change our fate

# 7,100+ CITIES

REPRESENTING

# 600

MILLION  
PEOPLE



# 8%

OF TOTAL  
GLOBAL  
POPULATION

IN OTHER  
WORDS

THE WORLD'S LARGEST  
COALITION OF CITIES  
FIGHTING CLIMATE CHANGE



GLOBAL COVENANT  
*of* MAYORS *for*  
CLIMATE & ENERGY



COMPACT  
*of* MAYORS



Covenant of Mayors  
for Climate & Energy

# Disaster Management & Climate Change

Indian policy frameworks and key challenges

## Environment, Climate Change and Disaster Management

N. Mani

Climate Change Management

Walter Leal Filho Editor

## Climate Change and Disaster Management

Child Rights Series  
Plan International

## Disaster Risk Management, Conflict and Climate Change in the Monitoring of the UN Convention on the Rights of the Child

## CLIMATE CHANGE DISASTER MANAGEMENT AND ENVIRONMENT



International Strategy for Disaster Reduction

Briefing Note 01

## Climate Change and Disaster Risk Reduction

**Climate change and disaster risk reduction are closely linked.** More extreme weather events in future are likely to increase the number and scale of disasters, while at the same time, the existing methods and tools of disaster risk reduction provide powerful capacities for adaptation to climate change. This Briefing Note outlines the nature and significance of climate change for disaster risk, as well as the main perspectives and approaches of disaster risk reduction and how they can support adaptation strategies. It is aimed at experts and practitioners as well as non-specialists such as teachers and students, journalists and the interested public.

Geneva, September 2008



United Nations

### Weather, climate and climate change

#### Defining climate change

For most people, the expression "climate change" means the alteration of the world's climate that we humans are causing, through fossil fuel burning, clearing forests and other practices that increase the concentration of greenhouse gases (GHG) in the atmosphere. This is in line with the official definition by the United Nations Framework Convention on Climate Change (UNFCCC) that climate change is the change that can be attributed "directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods".<sup>1</sup>

However, scientists often use the term for any change in the climate, whether arising naturally or from human causes. In particular, the Intergovernmental Panel on Climate Change (IPCC) defines "climate change" as "a change in the state of the climate that can be identified ... by changes in the mean and / or the variability of its properties, and that persists for an extended period, typically decades or longer".<sup>2</sup> Each of these two definitions is relevant and important to keep in mind.

<sup>1</sup> Greenhouse gases (GHGs) are those gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and emit radiation at specific wavelengths within the spectrum of thermal infrared radiation emitted by the Earth's surface, the atmosphere itself, and by clouds. The primary greenhouse gases include H<sub>2</sub>O, CO<sub>2</sub>, N<sub>2</sub>O, CH<sub>4</sub> and O<sub>3</sub>. IPCC Fourth Assessment Report, Working Group I, Glossary of Terms. [http://ipcc-wg1.ucar.edu/wg1/ReportARWG1\\_Print\\_Annexes.pdf](http://ipcc-wg1.ucar.edu/wg1/ReportARWG1_Print_Annexes.pdf)

<sup>2</sup> UNFCCC Article 1, Definitions. [http://unfccc.int/essential\\_background/convention/background/term1/1480.php](http://unfccc.int/essential_background/convention/background/term1/1480.php)

<sup>3</sup> IPCC Fourth Assessment Report, Working Group I, Glossary of Terms. [http://ipcc-wg1.ucar.edu/wg1/ReportARWG1\\_Print\\_Annexes.pdf](http://ipcc-wg1.ucar.edu/wg1/ReportARWG1_Print_Annexes.pdf)

**CLIMATE CHANGE  
ADAPTATION (CCA)**

**COMMON  
CHALLENGES**

**DISASTER RISK  
REDUCTION (DRR)**

**Gradual effects of  
climate change  
e.g. sea level rise,  
increased air  
temperature,  
glacial melt**

**Changes in  
climate risks  
e.g. floods,  
storms, heat,  
slope instability,  
drought**

**Non climate-  
related risks  
e.g. earthquakes,  
volcanic eruptions,  
technological /  
technical hazards**

Source: <https://www.acclimatise.uk.com/2018/04/23/using-foresight-to-mobilise-joint-action-in-climate-adaptation-and-disaster-risk-reduction/>



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**Which of the following climate-related natural hazards have touched your world over the last 10 years?**



Voting is closed

Open voting

0

[illegible]

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i

# What were the impacts of these disasters?

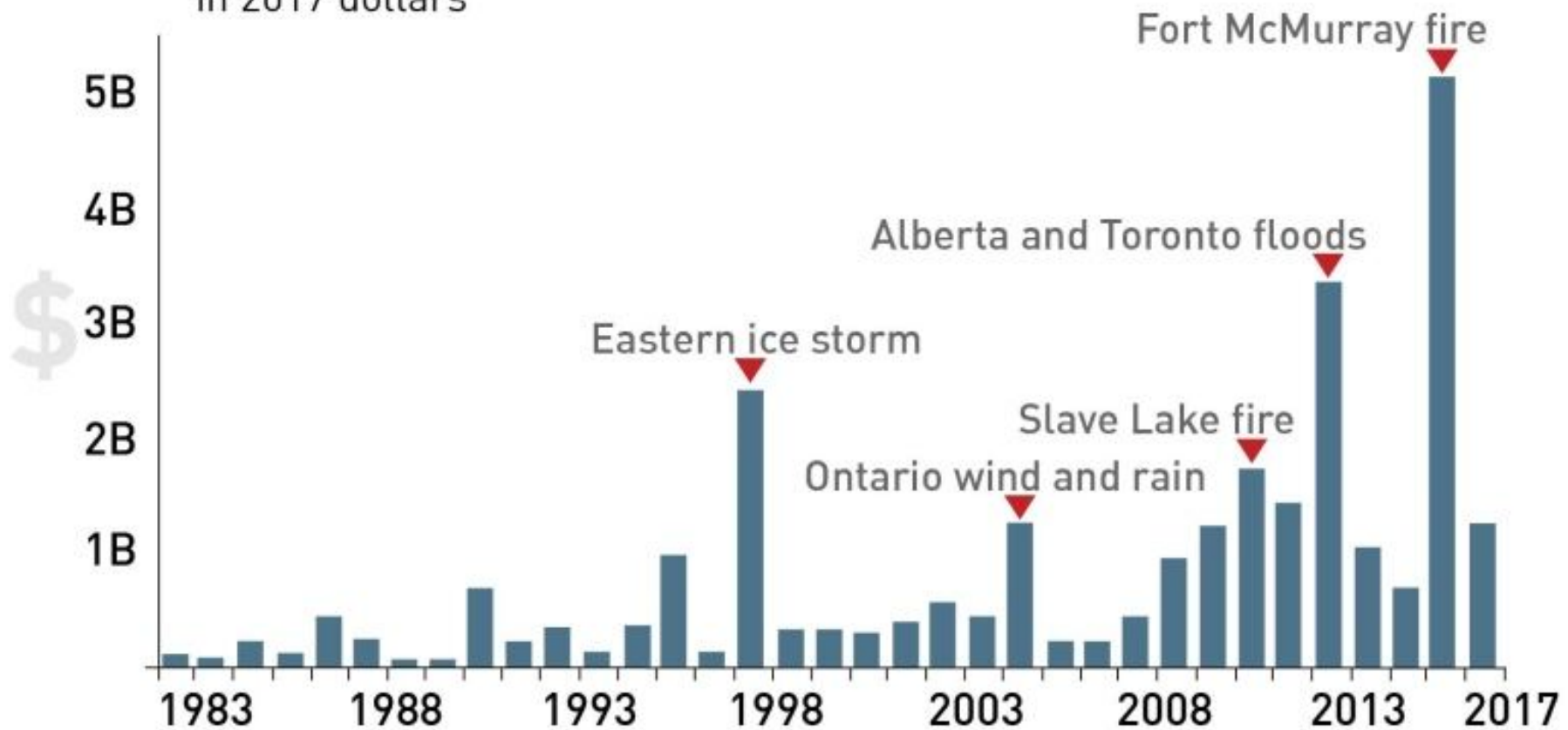
Pause scroll

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<https://www.menti.com/td4d4yga4a>

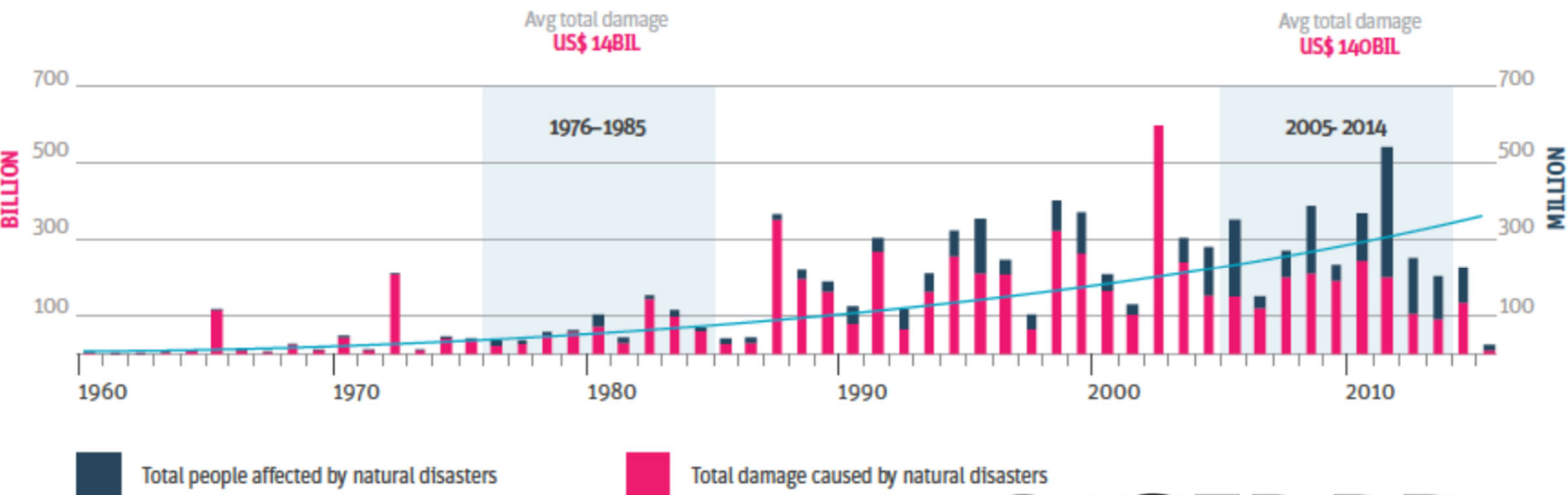
# Catastrophic losses in Canada

in 2017 dollars





While annual losses and deaths from natural disasters vary, **long-term average of total annual damage is increasing at an exponential rate.**

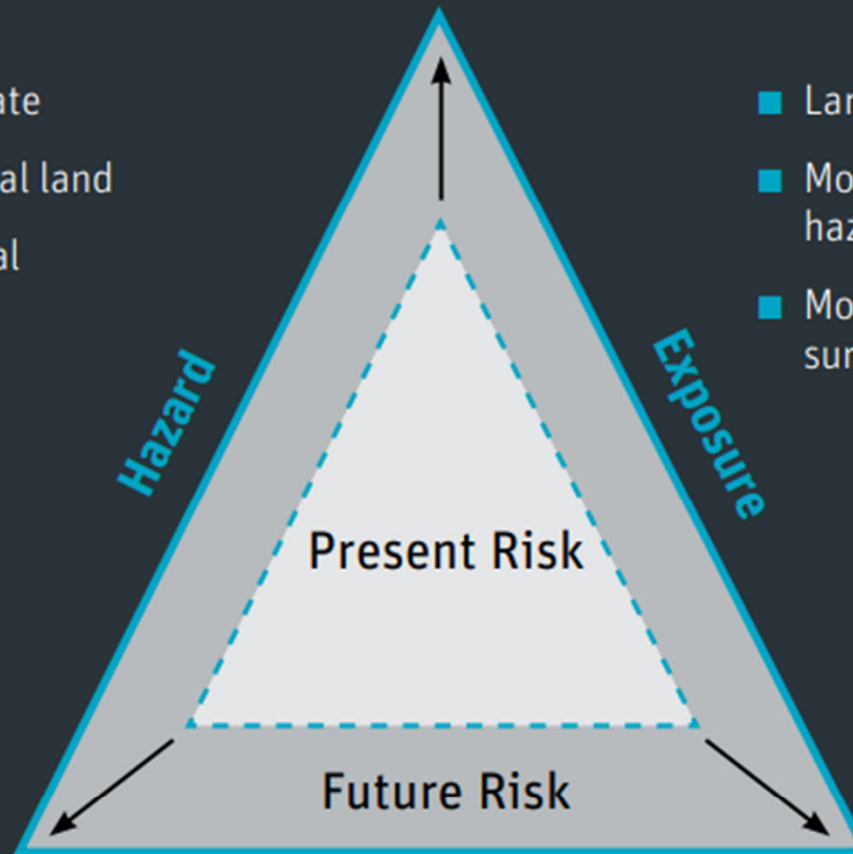


**GFDRR**  
Global Facility for Disaster Reduction and Recovery

## A RISKIER FUTURE

- Warmer climate
- Sinking coastal land
- Environmental degradation

- Larger population
- More developed hazardous areas
- More impermeable surfaces



Future Risk

Present Risk

Hazard

Exposure

Vulnerability

- Informal construction

- Less social support

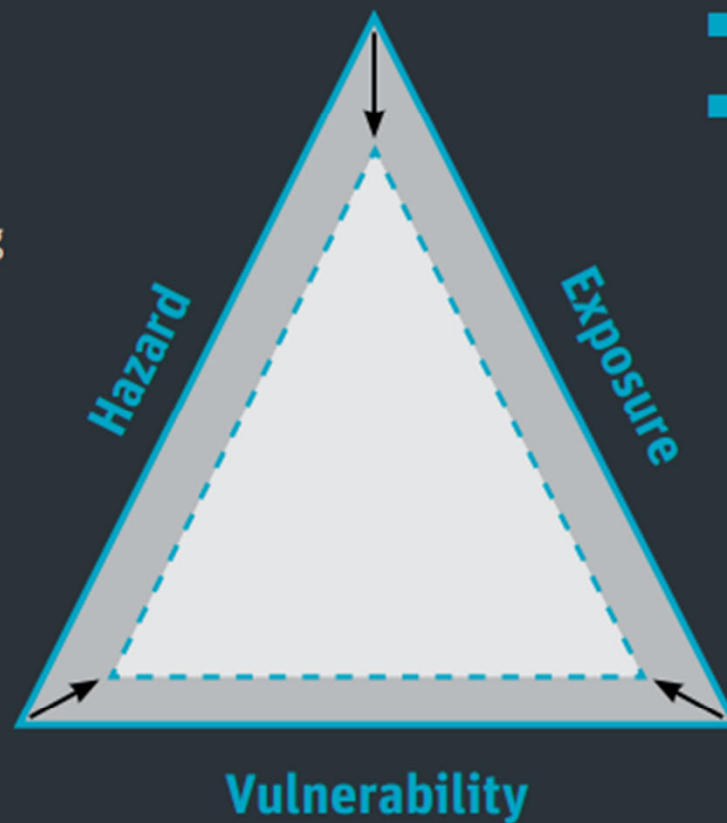
- More compounding shocks/impacts



## AN EQUALLY/LESS RISKY FUTURE

- Climate change mitigation
- Urban design
- Resource planning

- Land-use planning
- Managed urban expansion



- Urban planning/  
construction

- Social safety nets

- Greater resilience



The background of the slide is a globe composed of numerous puzzle pieces. Each piece depicts a different scene, including lush green forests, urban cityscapes with buildings, and serene blue landscapes with water and mountains. The globe is shown from a slightly low angle, curving towards the right side of the frame.

# **The global state of sustainable insurance**

Understanding and integrating environmental, social and governance factors in insurance



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i

## What are the top 3 factors limiting integration of climate-related risks in your organization?

0%

Lack of knowledge of  
climate risks

0%

Difficulty quantifying  
climate risks

0%

Lack of resources

0%

Limited collaboration  
across organization

0%

Limited management  
support

0%

Limited public support

0%

Long-term nature of  
climate risks

 0

Sustainability and enterprise risk management:  
The first step towards integration



Limited knowledge of sustainability risks



Omission of opportunities or strategic risks



Difficulty quantifying sustainability risks



Limited cross-functional collaboration



Longer time horizons for sustainability risks



Source: <https://www.frontiersin.org/articles/10.3389/feart.2018.00183/full>

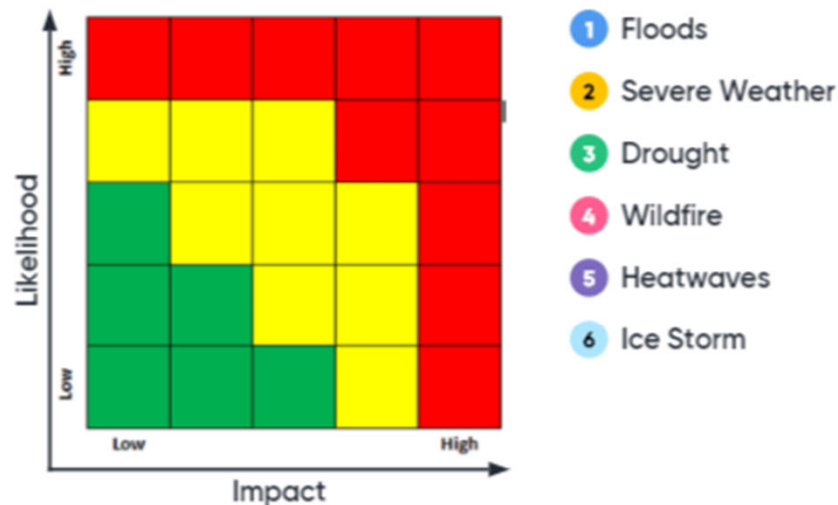
# Risk Matrix

		Impact →				
		Negligible	Minor	Moderate	Significant	Severe
Likelihood ↑	Very Likely	Low Med	Medium	Med Hi	High	High
	Likely	Low	Low Med	Medium	Med Hi	High
	Possible	Low	Low Med	Medium	Med Hi	Med Hi
	Unlikely	Low	Low Med	Low Med	Medium	Med Hi
	Very Unlikely	Low	Low	Low Med	Medium	Medium

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**Rate the likelihood and impact of climate-related risks for your organization/community?**

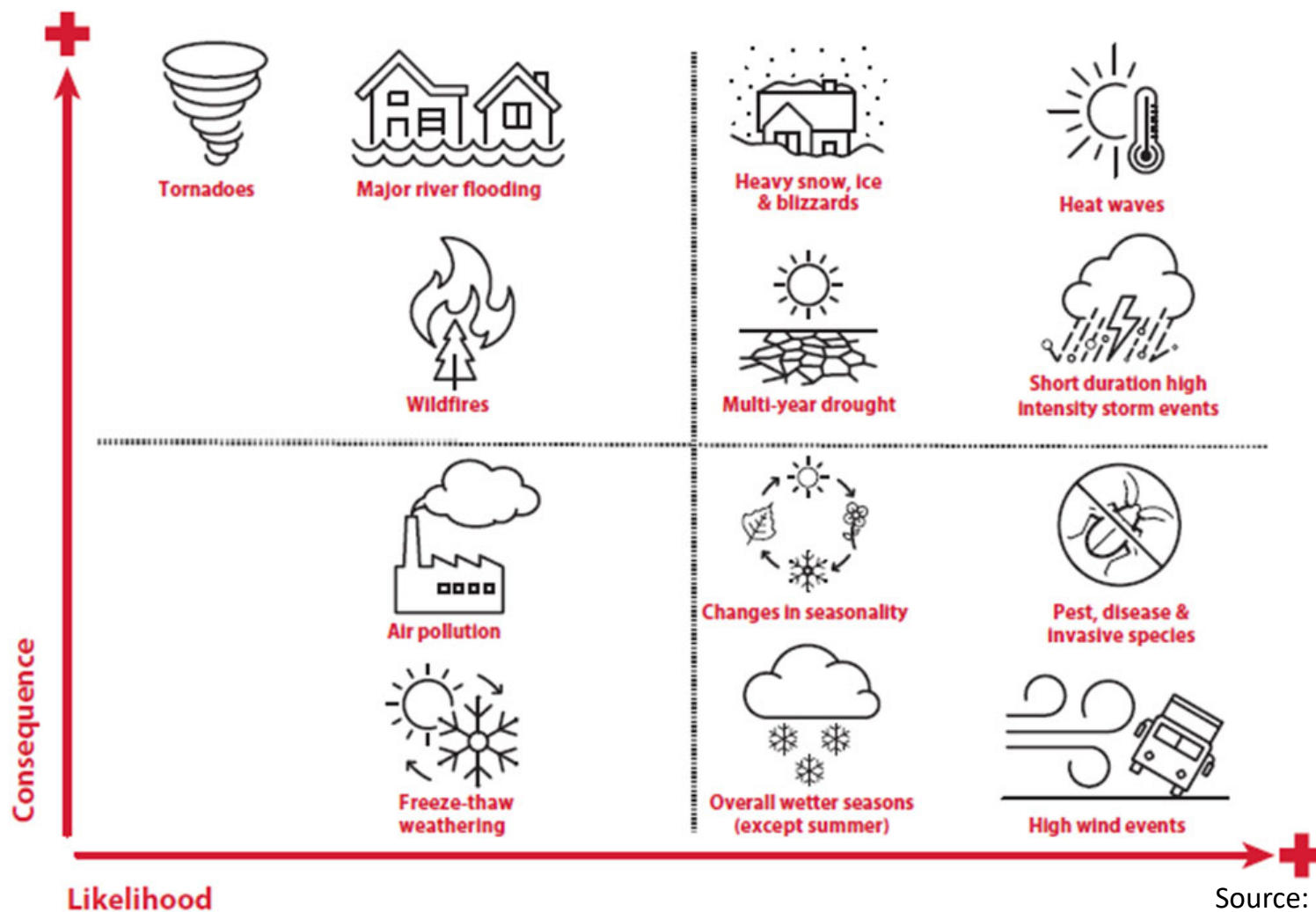


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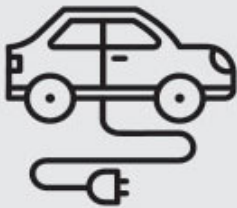
# Calgary's Climate Risks profile



# MITIGATION

**ACTION TO REDUCE EMISSIONS  
THAT CAUSE CLIMATE CHANGE**

**Sustainable  
transportation**



**Clean energy**

**Energy  
efficiency**



**Water  
conservation**



**New energy  
systems**



**Local food**



**Education**



**Complete  
communities**



**Urban  
forest**

# ADAPTATION

**ACTION TO MANAGE THE RISKS OF  
CLIMATE CHANGE IMPACTS**

**Disaster management  
& business continuity**



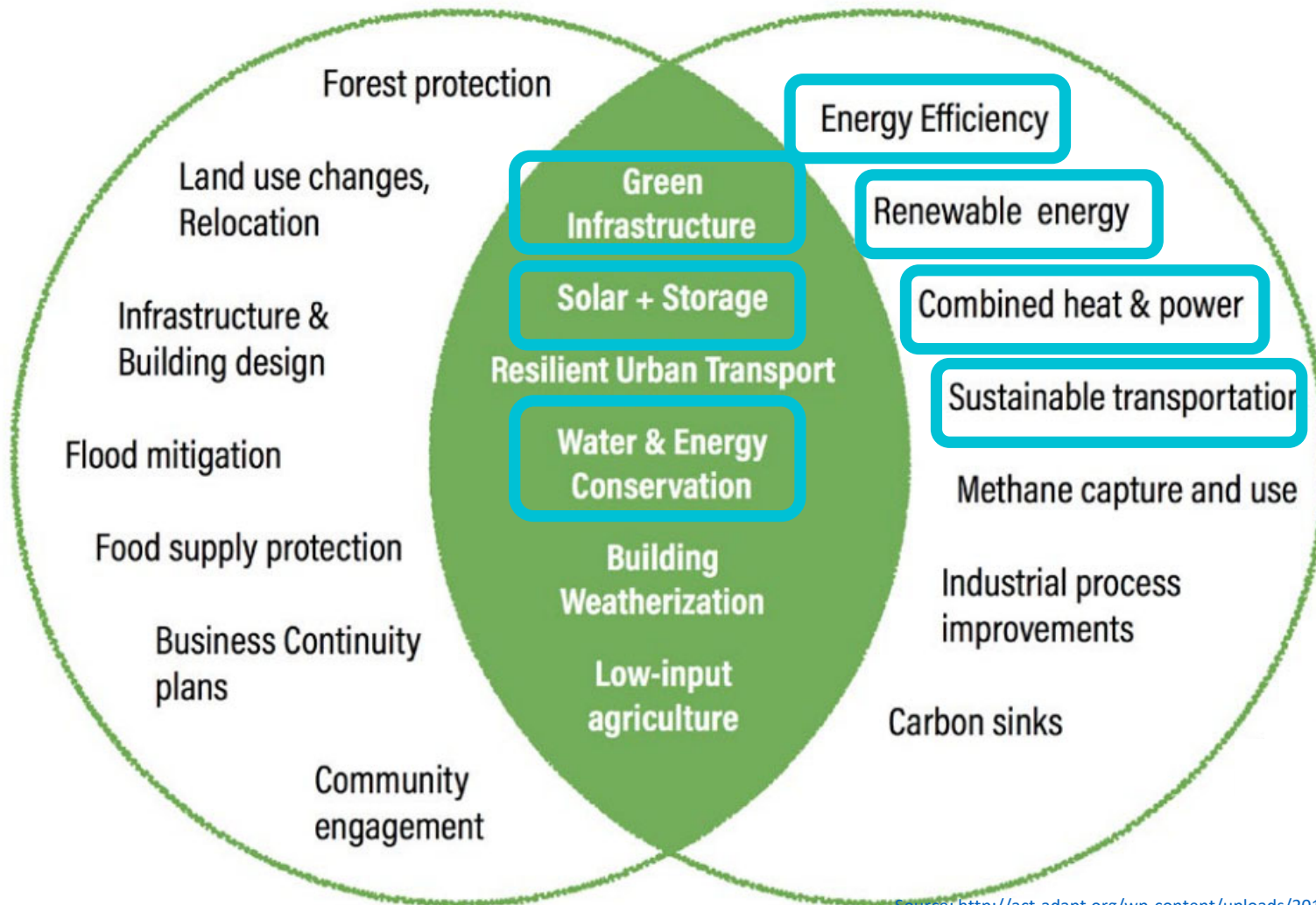
**Flood  
protection**



**Infrastructure  
upgrades**

Source: City of Calgary

# Adaptation + Mitigation



Source: [http://act-adapt.org/wp-content/uploads/2017/11/ACT\\_ALTGR\\_Web4.pdf](http://act-adapt.org/wp-content/uploads/2017/11/ACT_ALTGR_Web4.pdf)



## **Four Ways to Mitigate Climate Risk**



# Solar



Source: <https://pxhere.com/en/photo/450477>



# Alberta Municipal Solar Program



**Municipal  
Climate Change  
Action Centre**

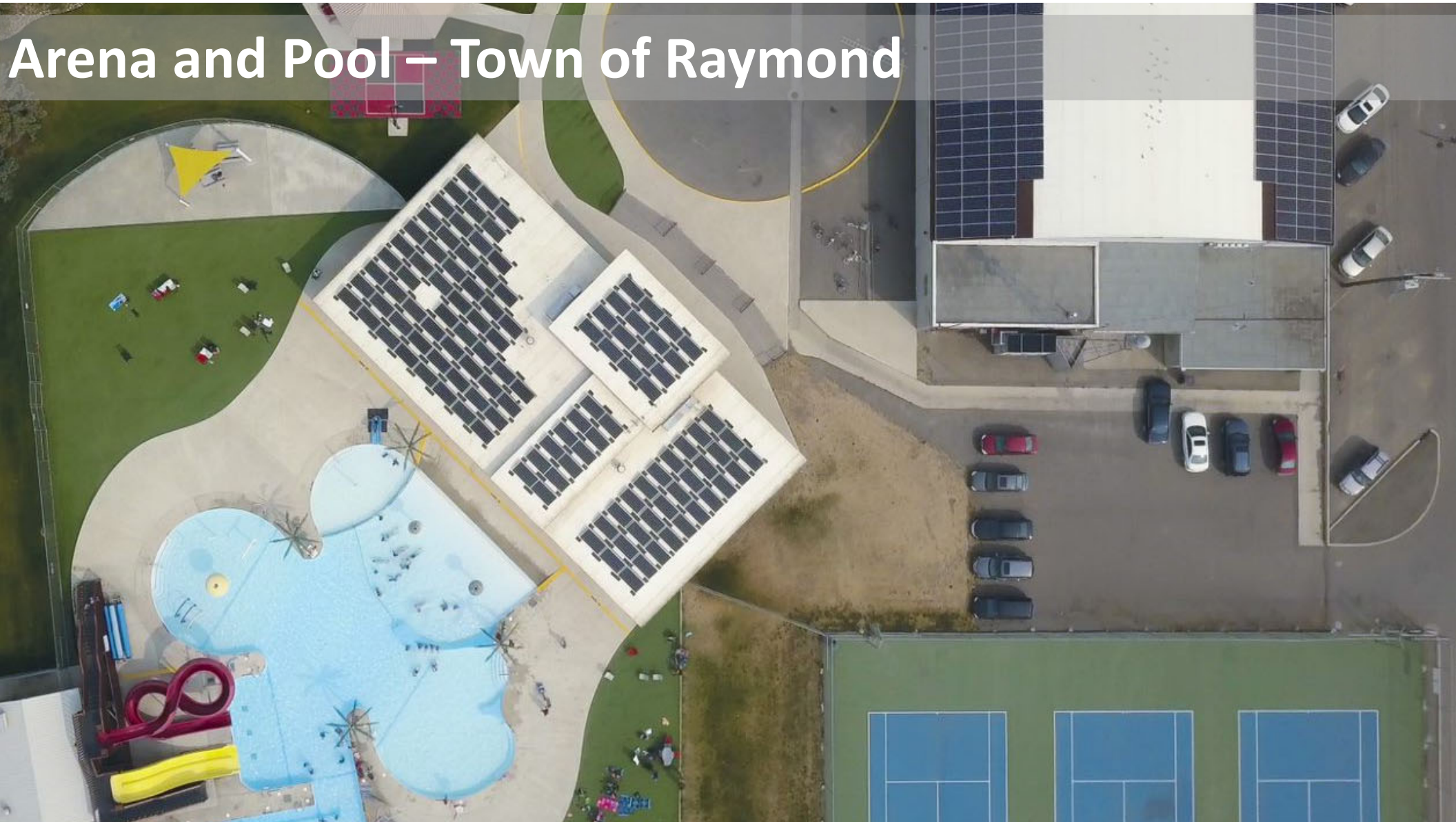
*Wheatland County Administration Building  
60.2 kW System  
2017*

# Victoria Park Carport – Town of Raymond



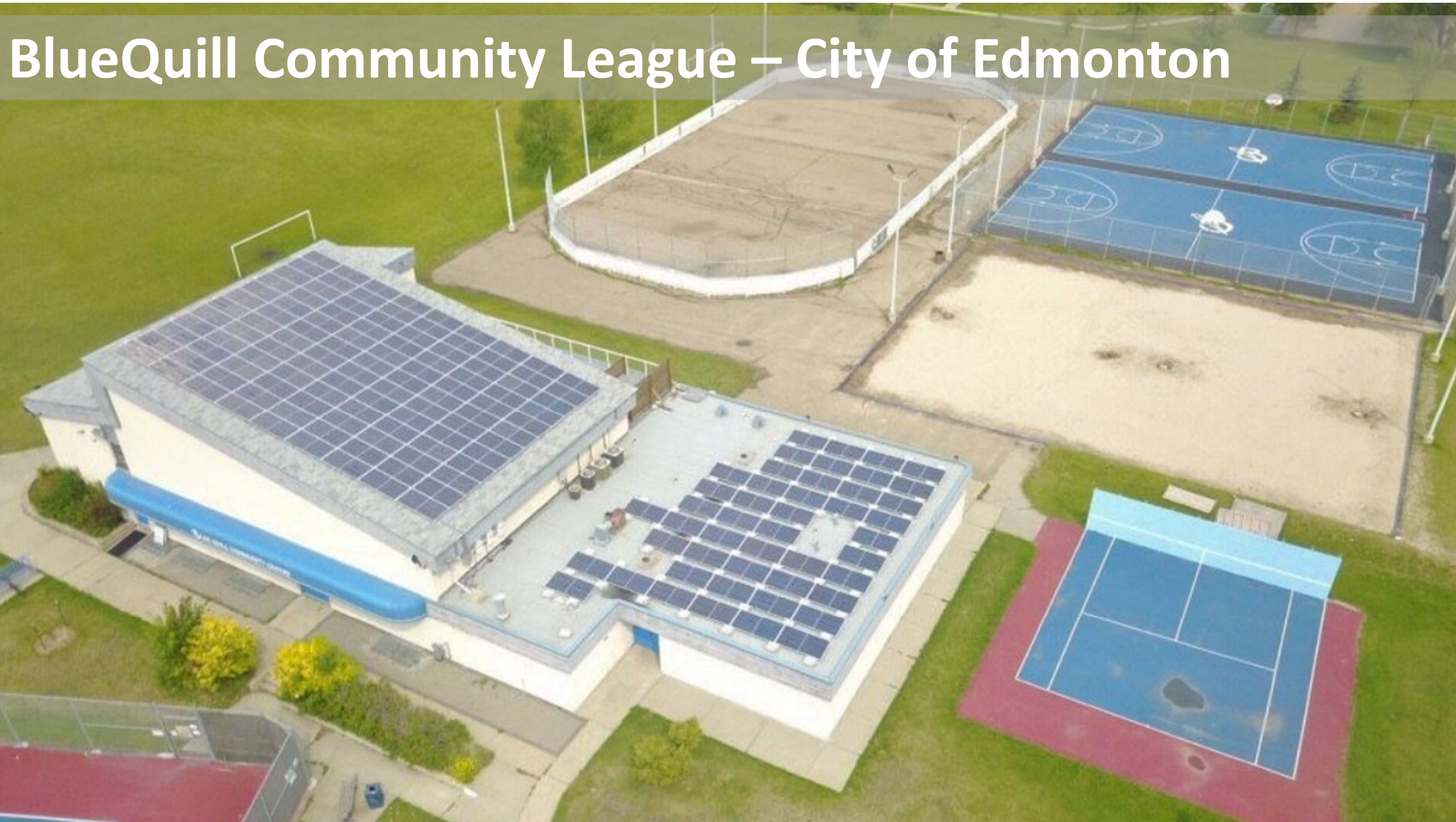


# Arena and Pool – Town of Raymond





# BlueQuill Community League – City of Edmonton



# Electric Vehicles and Charging Infrastructure



<https://pixabay.com/photos/electric-car-car-electric-vehicle-1458836/>



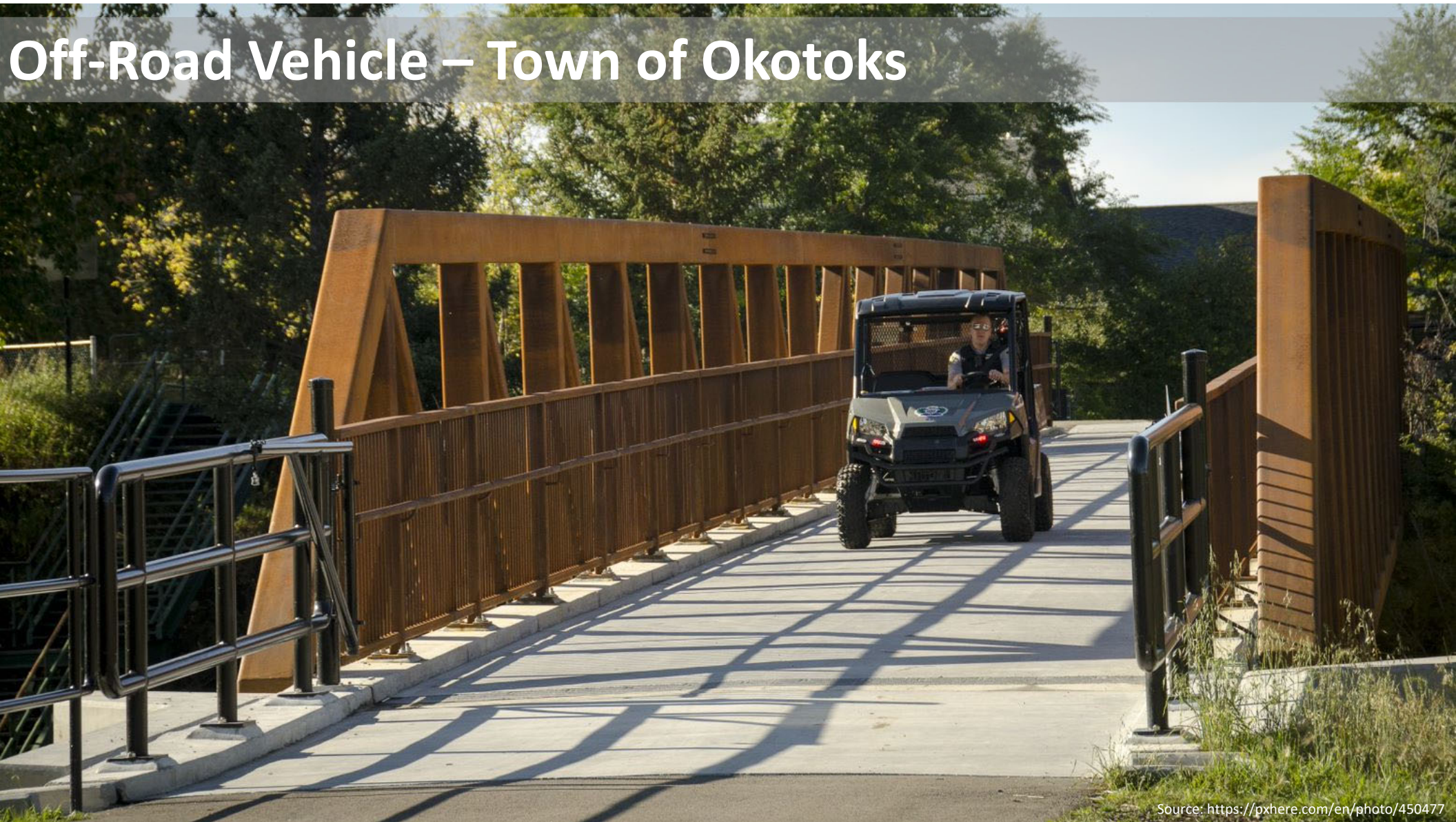
# Electric Vehicles for Municipalities



Municipal  
Climate Change  
Action Centre

*Town of Okotoks  
2019*

# Off-Road Vehicle – Town of Okotoks



Source: <https://pxhere.com/en/photo/450477>



# Electric Car— City of Leduc



Source: <https://pxhere.com/en/photo/450477>



# Parkade Sweeper – Town of Banff



Source: <https://pxhere.com/en/photo/450477>

# Electric vehicle programs

- Zero Emission Vehicles, Natural Resources Canada
- Clean Energy Vehicles for British Columbia







# Energy Efficiency

Source: <https://pixabay.com/photos/led-bulbs-lights-electricity-823383/>

# Recreation Energy Conservation Program



Municipal  
Climate Change  
Action Centre

*High River  
Bob Snodgrass Recreation Complex  
2019*

# Arena – Town of Bon Accord



Source: <https://pxhere.com/en/photo/450477>

# Efficiency programs

- Efficiency Nova Scotia
- Energy Efficiency Alberta
- Arctic Energy Alliance
- Efficiency Manitoba
- Natural Resources Canada





# Energy Management



# Municipal Energy Manager Program



Municipal  
Climate Change  
Action Centre

*St. Albert  
2019*

# Energy manager programs

- Natural Resources Canada
- Federation of Canadian Municipalities
- BC Hydro
- Independent Electricity System Operator



**Solar**

**Energy Efficiency**

**Four Ways to Mitigate  
Climate Risk**

**Electric Vehicles and  
Charging Infrastructure**

**Energy Management**

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## Which climate mitigation approach most interests you?



- Solar
- Energy efficiency
- Electric vehicles & charging infrastructure
- Energy management

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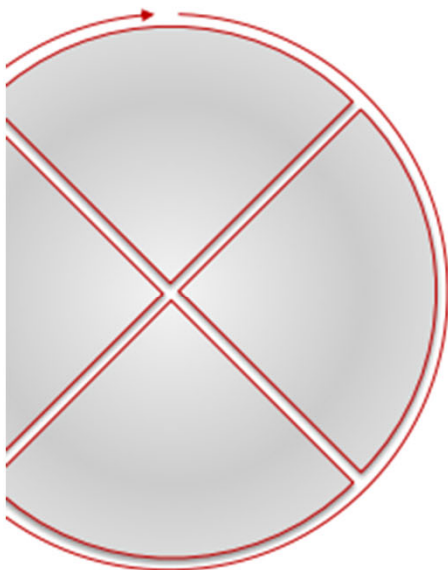
Go to [www.menti.com](https://www.menti.com) and use the code **26 79 06**



**What would help you move forward on climate action?**

Pause scroll





## CLIMATE RESILIENCE EXPRESS

AN ACTION KIT FOR ALBERTA COMMUNITIES



Municipal  
Climate Change  
Action Centre

[mccac.ca](http://mccac.ca)



Adaptation	Mitigation
<ul style="list-style-type: none"><li>• <b>Building Adaptive and Resilient Communities</b></li><li>• Climate adaptation plans</li></ul>	<ul style="list-style-type: none"><li>• <b>Partners for Climate Protection</b></li><li>• Greenhouse gas inventories</li></ul>





Energy  
Efficiency  
Alberta



## Green Loan Guarantee Program

The Green Loan Guarantee Program is a credit enhancement program designed to support financial institutions and utilities that offer financing for energy efficiency, renewable energy and clean technology projects.



# MUNICIPAL CLIMATE ACTION LANDSCAPE



# ALBERTA FUNDING GUIDE



# Alberta Municipal Solar Program CASE STUDY: TOWN OF RAYMOND



<https://mccac.ca/learning-centre/>



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Action Centre

mccac.ca

**7** AFFORDABLE AND  
CLEAN ENERGY



**13** CLIMATE  
ACTION



**11** SUSTAINABLE CITIES  
AND COMMUNITIES



**17** PARTNERSHIPS  
FOR THE GOALS



# THANK YOU



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