



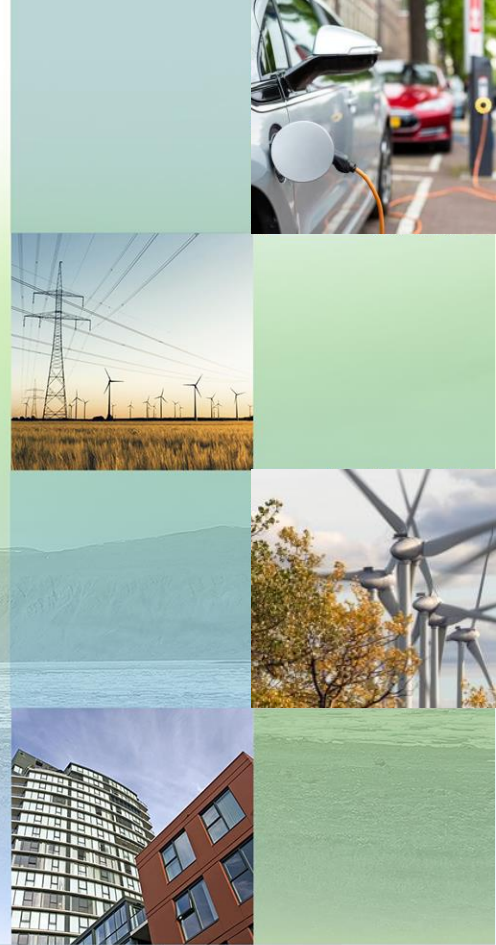
Natural Resources  
Canada

Ressources naturelles  
Canada

# Federal Perspectives on Electrification

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# Overview

- ☑ Background
- ☑ Recent Efforts
- ☑ Challenges and opportunities
- ☑ What's next

# Canada is starting from a position of strength

## Clean

- **80%** of our electricity comes from non-emitting sources (2<sup>nd</sup> cleanest in the OECD)
- No sector has reduced GHGs more than electricity (**39% decrease since 2001**)

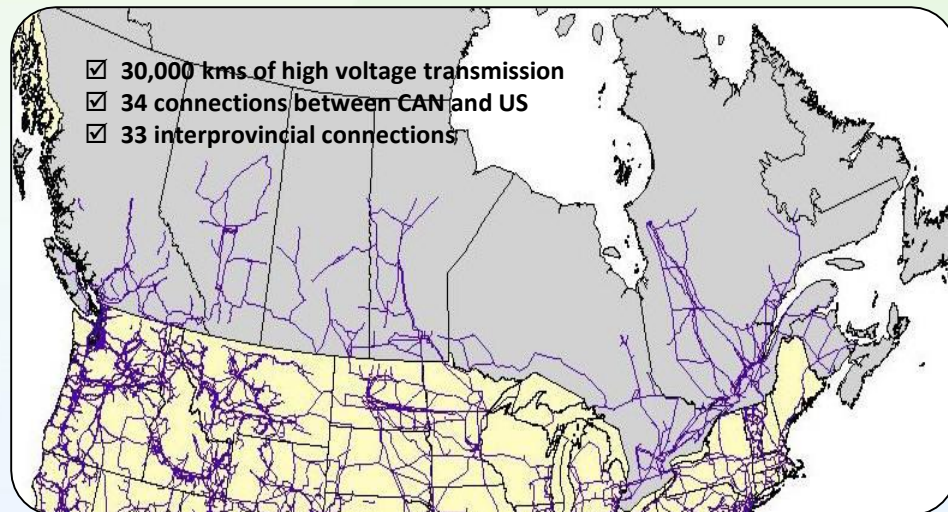
## Reliable

- **Highly reliable and secure** North American bulk power system

## Affordable

- **3rd lowest residential rates** and 7th lowest industrial rates in the OECD

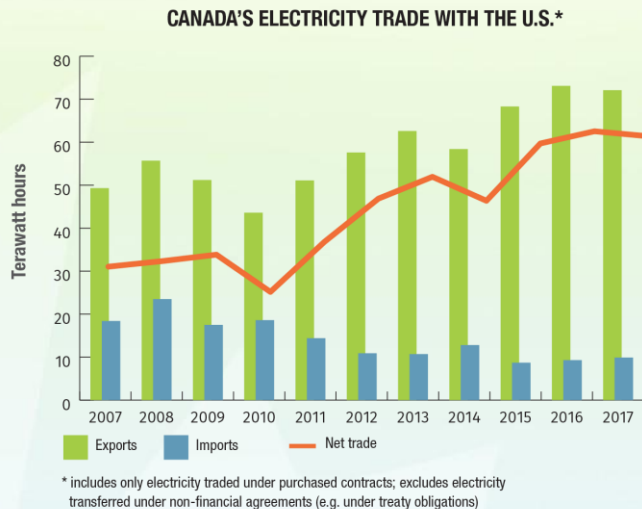
Affordable



## BACKGROUND:

# Electricity delivers a wide range of benefits

- \$11 billion/year to Canada's real GDP
- 156,000 jobs across the country
- \$25B/year in capital investment
- \$3 billion in exports to the US in 2017
- 6<sup>th</sup> largest electricity producer in the world



*Reliable, affordable power provides **a competitive advantage for our businesses** and contributes to the **high quality of life afforded to Canadians***

RECENT PROGRESS:

# Jurisdictions are making clean energy investments ...

**Territories** collective efforts to reduce use of diesel (e.g. Old Crow solar, YK, Inuvik Wind, NWT, Iqaluit, NU)

**British Columbia** will make industries clean by using clean energy (e.g. electrification of gas production)

**Alberta** phasing out coal-fired electricity (supported with the Renewable Electricity Program)

**Saskatchewan's** target of 50% renewable energy generation by 2030

**Manitoba's** Keeyask + electricity partnership with Saskatchewan (e.g. Birtle-Tantallon line)

**Ontario's** storage and smart grid investments, building on coal-phase out

**Newfoundland and Labrador's** commitment to energy efficiency and clean energy at Muskrat Falls

**Prince Edward Island's** wind and distributed energy expansion

**Nova Scotia's** energy efficiency and renewable electricity targets

**New Brunswick** Smart Grid research initiative (i.e. Smart Grid Innovation Network)

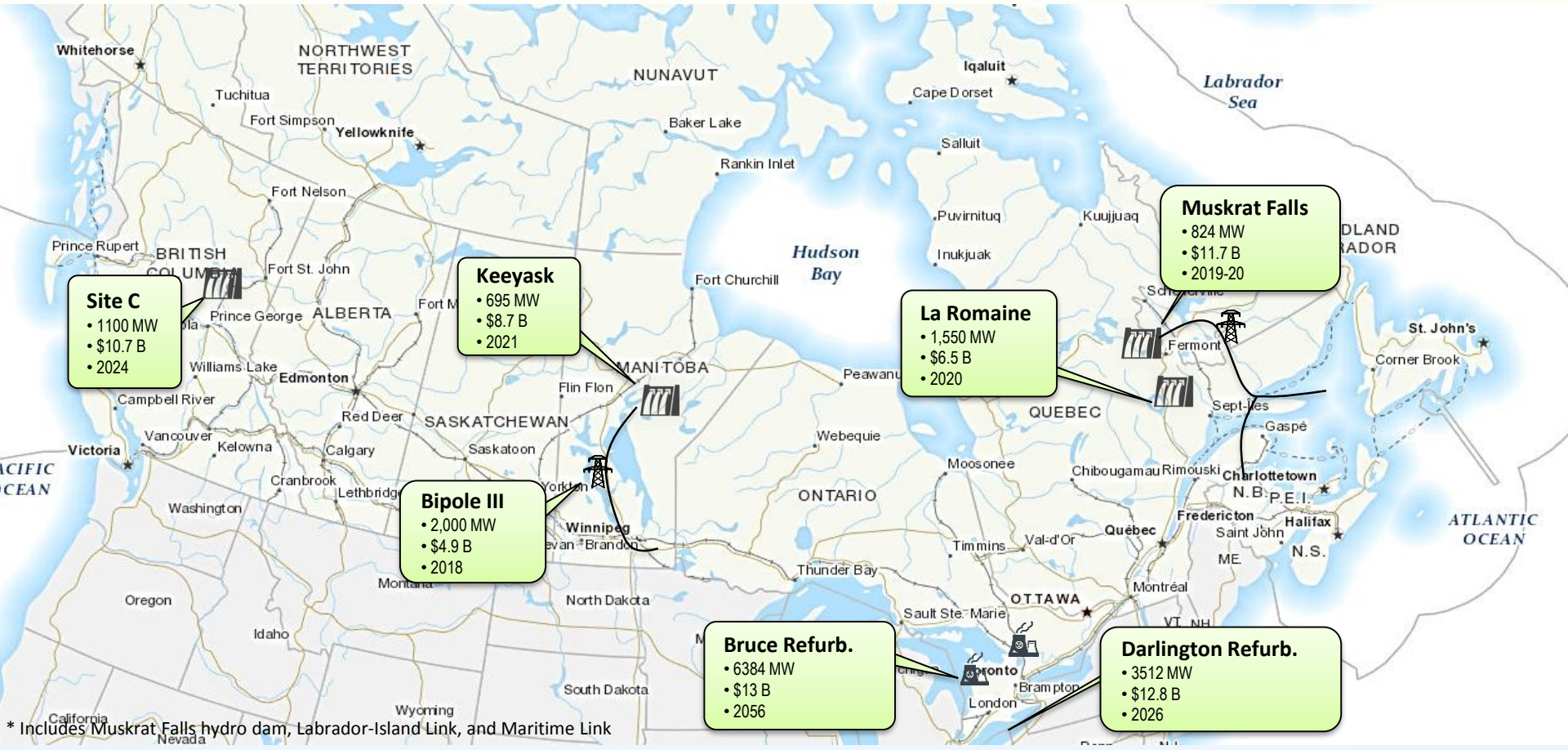
**Québec's** electric Vehicle and building efficiency initiatives





RECENT PROGRESS:

... including some of the largest investments in Canada.



\* Includes Muskrat Falls hydro dam, Labrador-Island Link, and Maritime Link

## **Federal initiatives are also helping to transform the sector**

- **Investments in the electricity sector**

- Emerging Renewables Power Program (e.g., tidal, geothermal, advanced solar)
- Smart Grids
- Clean Energy for Rural and Remote Communities
- EV Infrastructure Deployment and Demonstration

- **Federal coal- and natural gas-fired regulations are helping to shift Canada's electricity supply mix**

- **Examining how grid integration can enable decarbonization**

- Regional Electricity Cooperation and Strategic Infrastructure (RECSI) Initiative
- North American Renewable Integration Study (NARIS)

# The sector is undergoing significant transformation

## Prices

**Wind and solar** costs are dropping quickly worldwide

Low cost **natural gas** is an attractive option

**Consumers** increasingly sensitive to rate increases

## Markets

Smaller scale and more **decentralized grids** and microgrids

Emergence of **prosumers** selling energy back to the grid

## Technologies

**Energy storage** tech allowing for integration of intermittent sources

**Smart grids** improving demand mgmt and communication between system elements

Digitalized systems more vulnerable to **cyber threats**

## Demand

New sources of demand emerging (e.g. **electric vehicles**, data centres, industry)

Companies choosing clean power

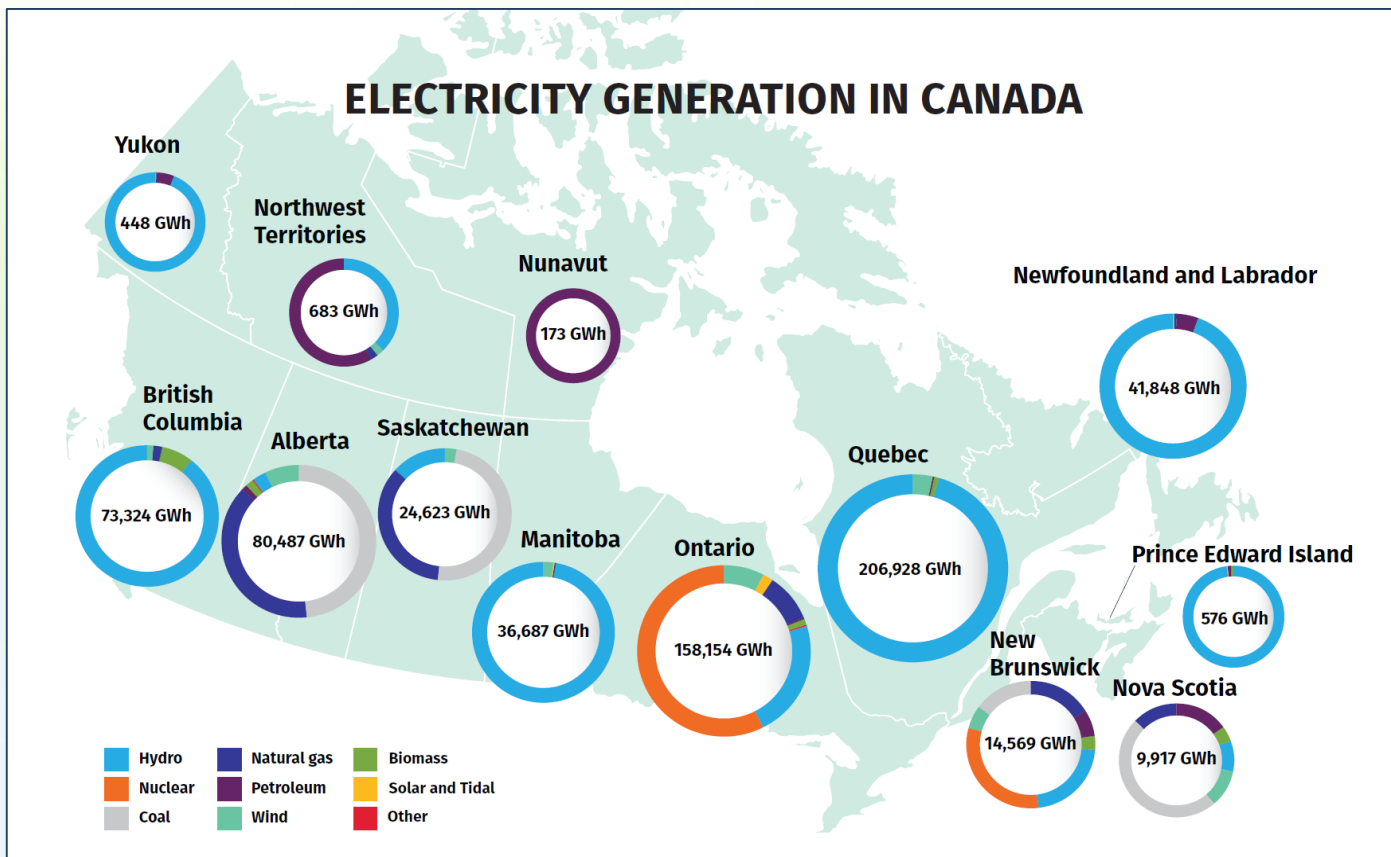
Prosumers shifting system costs on smaller rate base, **challenging business models**

*Policy makers and operators are making decisions in an increasingly complex environment*



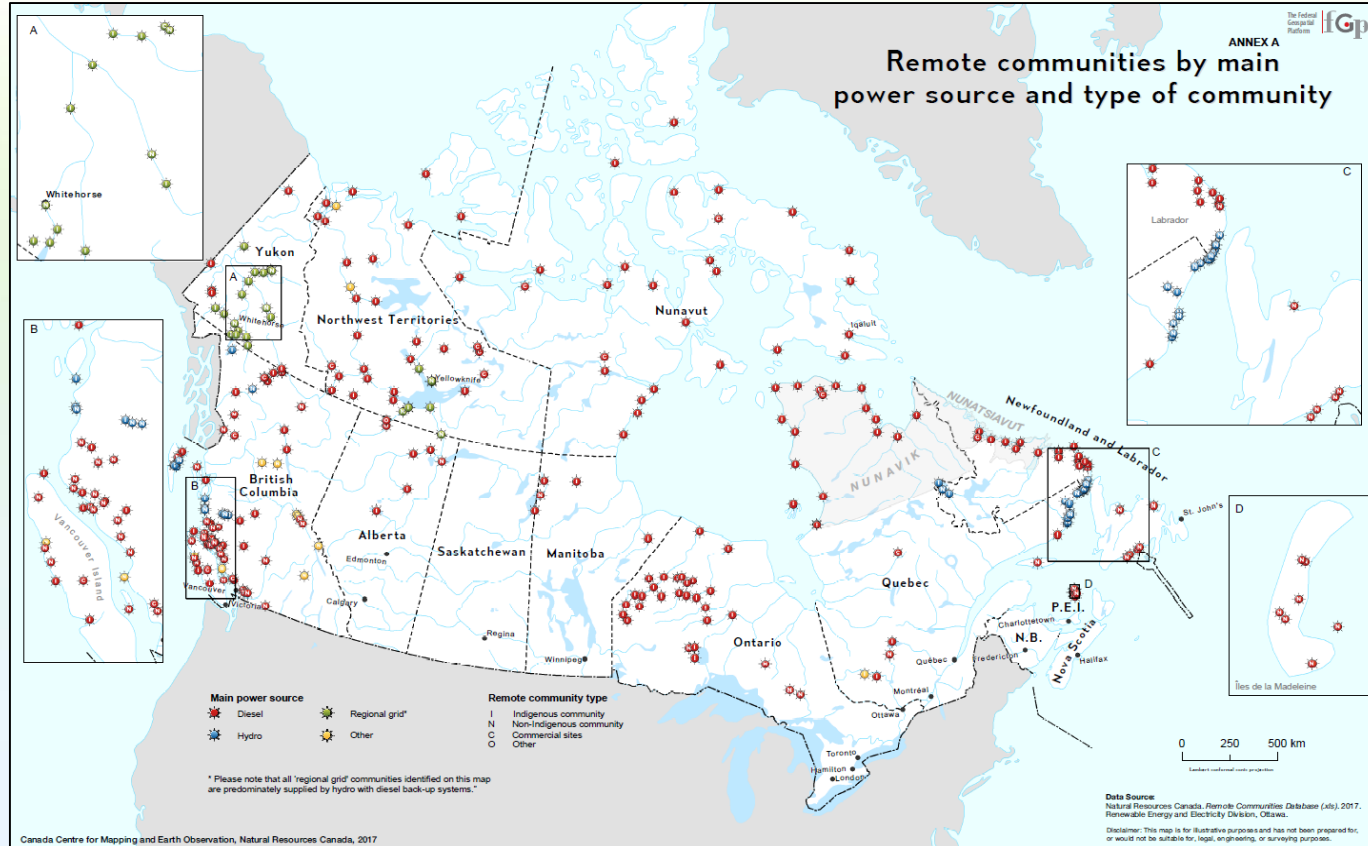
## CHALLENGES:

# Provinces reliant on fossil fuels are facing a major transition



## CHALLENGES:

# 200+ remote communities remain heavily reliant on diesel



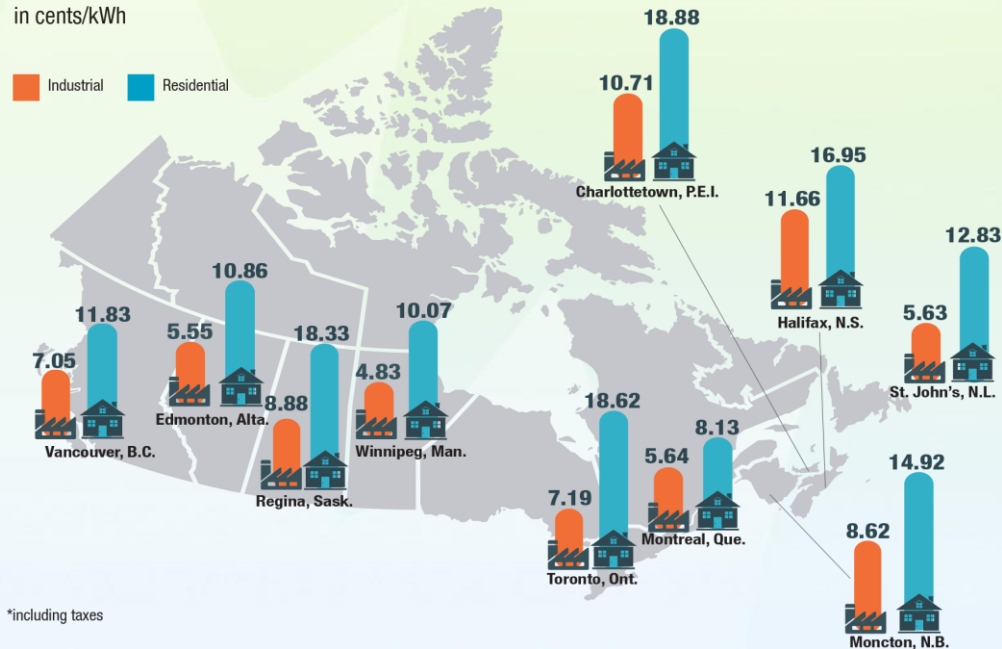
## CHALLENGES:

# Energy affordability and reliability remains a concern in parts of Canada

- Rates vary considerably across Canada
  - 38.5% of Atlantic Canadians in energy poverty
- Power outages caused by extreme weather events are increasing in frequency and intensity
- Cyber threats an area of growing concern

AVERAGE LARGE INDUSTRIAL AND RESIDENTIAL ELECTRICITY PRICES\* (AS OF APRIL 2017)  
in cents/kWh

Industrial Residential



OPPORTUNITIES:

# Immense untapped potential to electrify Canada's economy

- Electrification is a **key to unlocking deeper decarbonisation and meeting Paris goals**
- **Opportunities exist** to electrify key sectors of the Canadians economy, such as:
  - mining
  - oil, gas & LNG
  - petrochemical
  - manufacturing
  - iron and steel-making
  - buildings
- Electrification of heating and vehicles can **cut energy costs for homeowners, drivers, and businesses**
- Feasibility will vary by region based on cost and availability

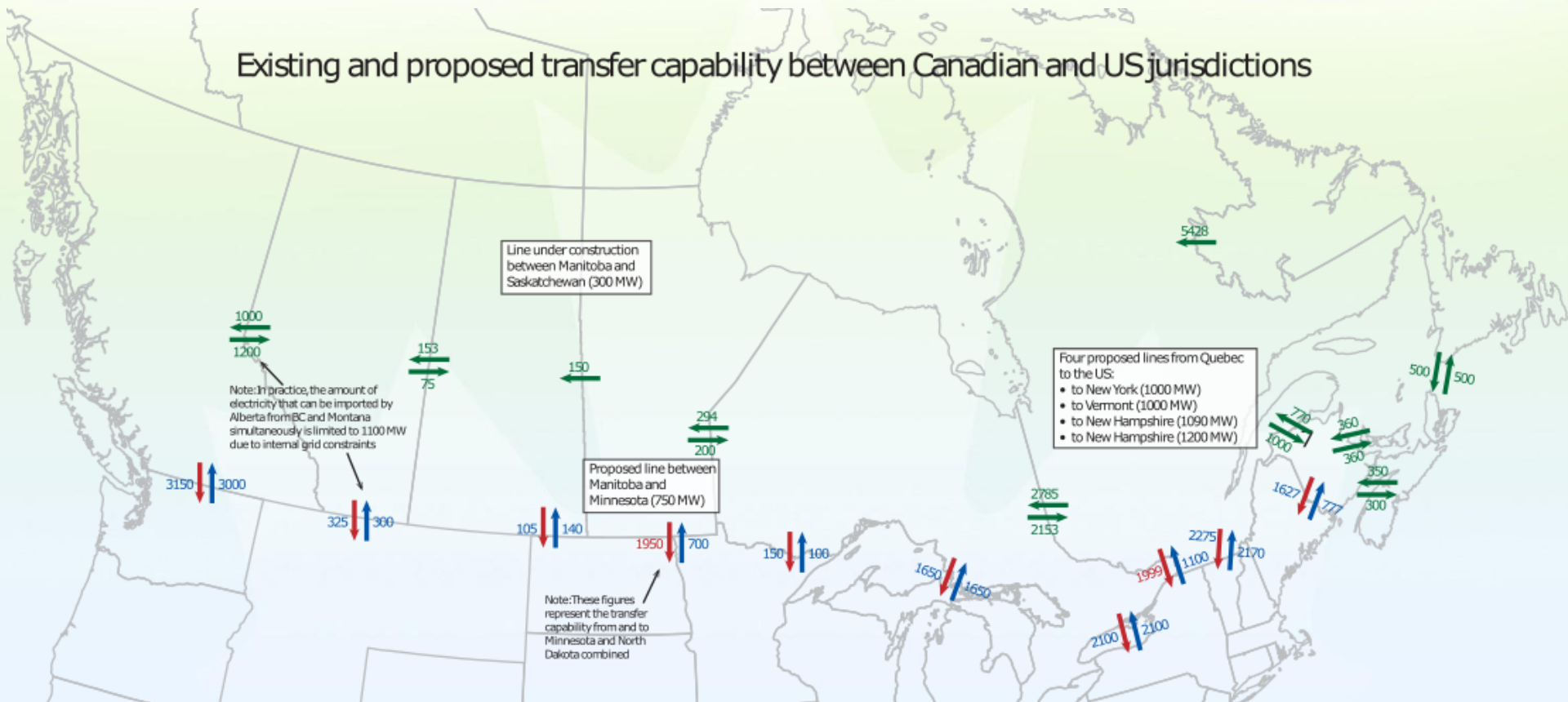
While  
**81%**  
of our electricity is  
emissions-free

Only  
**20%**  
of our energy use  
comes from  
electricity



OPPORTUNITIES:

# Connecting clean power to jurisdictions that need it can reduce costs and GHGs



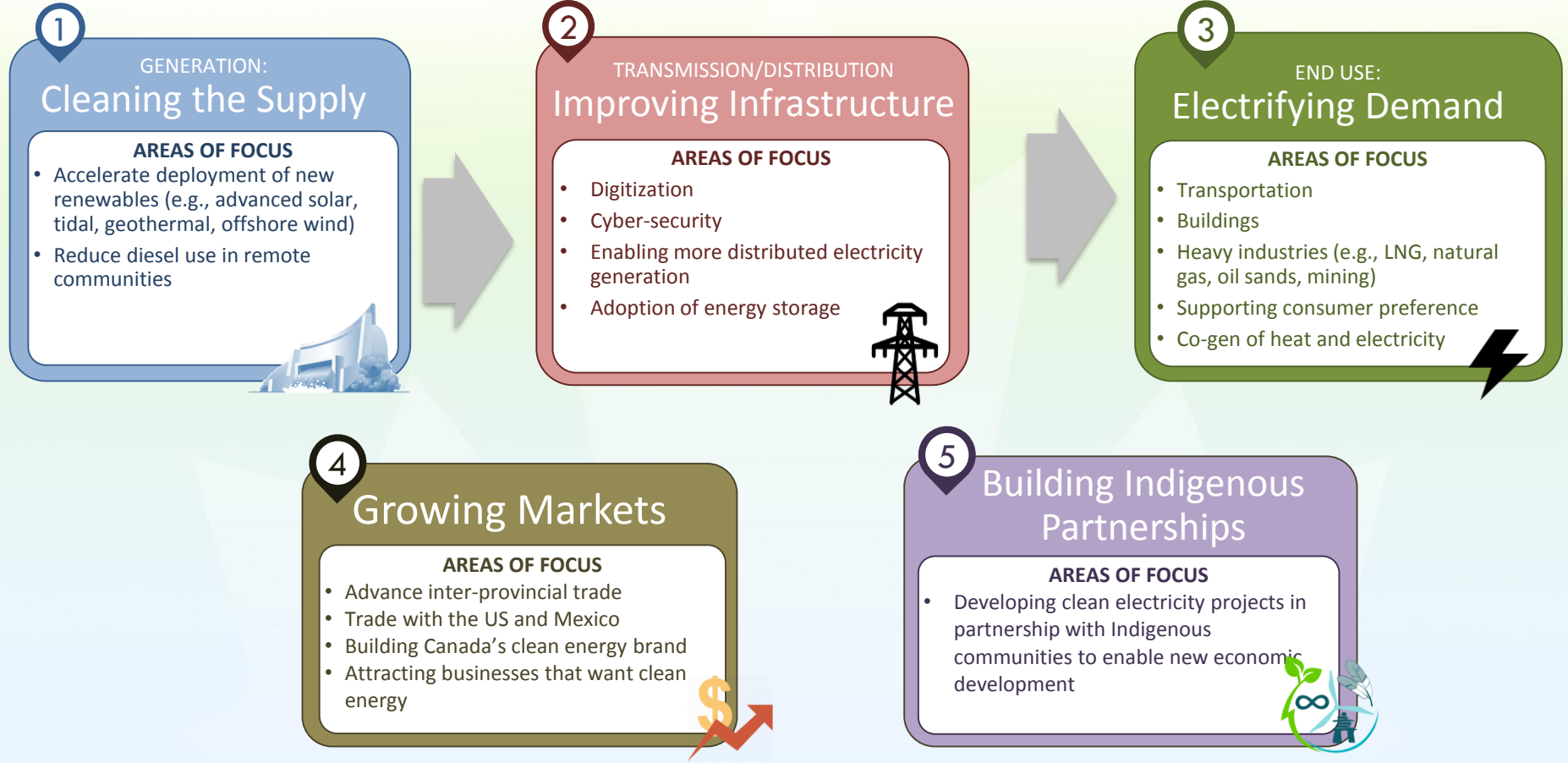


OPPORTUNITIES:

# Promising opportunities exist for Canadian leadership as the world shifts to clean power

1. Exporting clean power to growing US market
2. Attracting companies that put a premium on cheap, clean power
3. Manufacturing for electric transportation systems, incl. mining lithium and cobalt for batteries, storage systems, electric drive trains
4. Commercializing energy storage technology
5. Co-generating of electricity and heat

# Ongoing Areas of Focus





*“As First Ministers, we have agreed to collaborate on ways to promote clean growth while growing the economy. As a next step, First Ministers agreed to lead a discussion on the development of a **framework for a clean electric future**, including hydro, aimed at using **clean, reliable** and **affordable** electricity and to promote access to domestic and international markets (Dec 2018)*

THANK YOU 