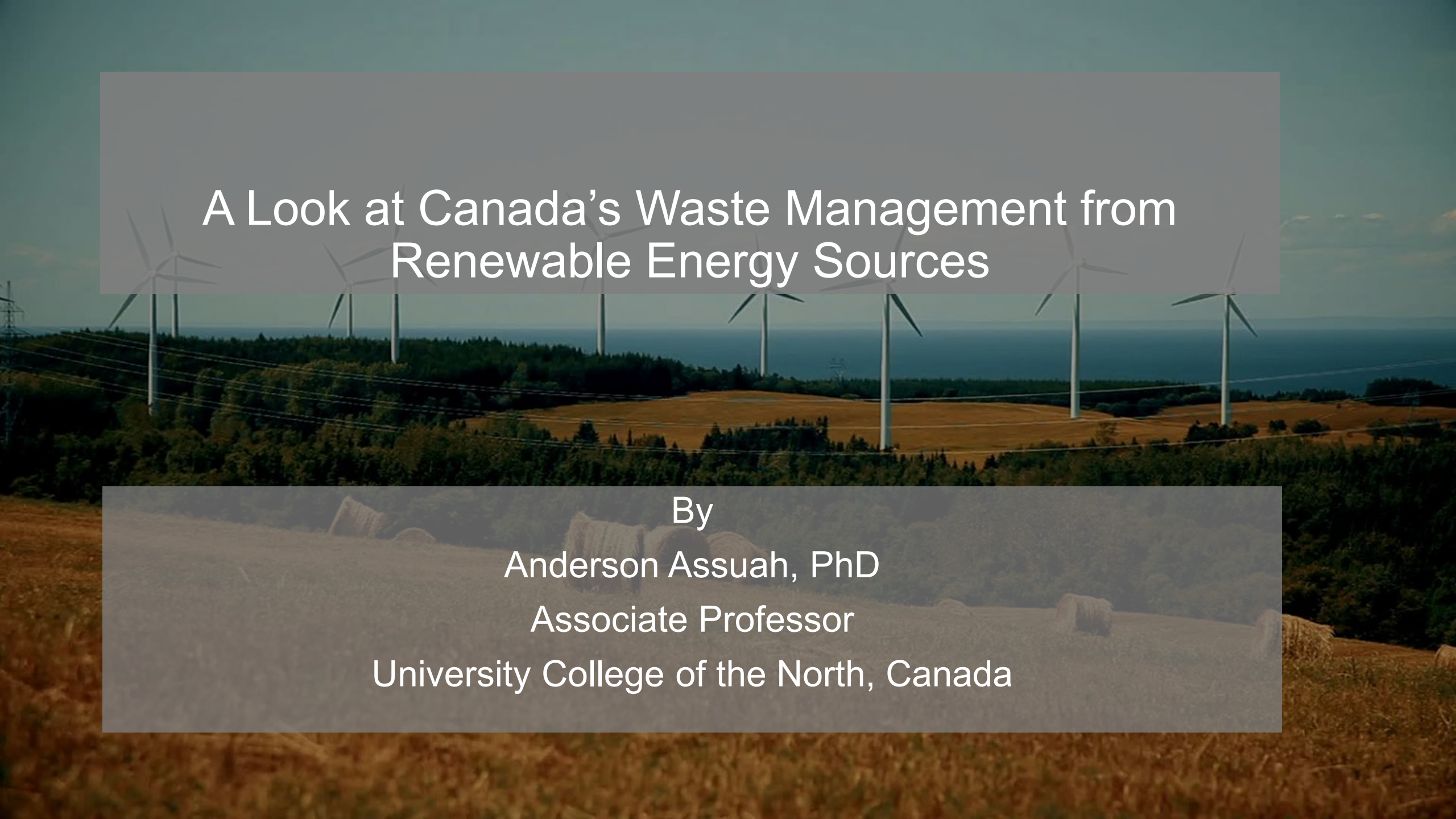




A Look at Canada's Waste Management from Renewable Energy Sources

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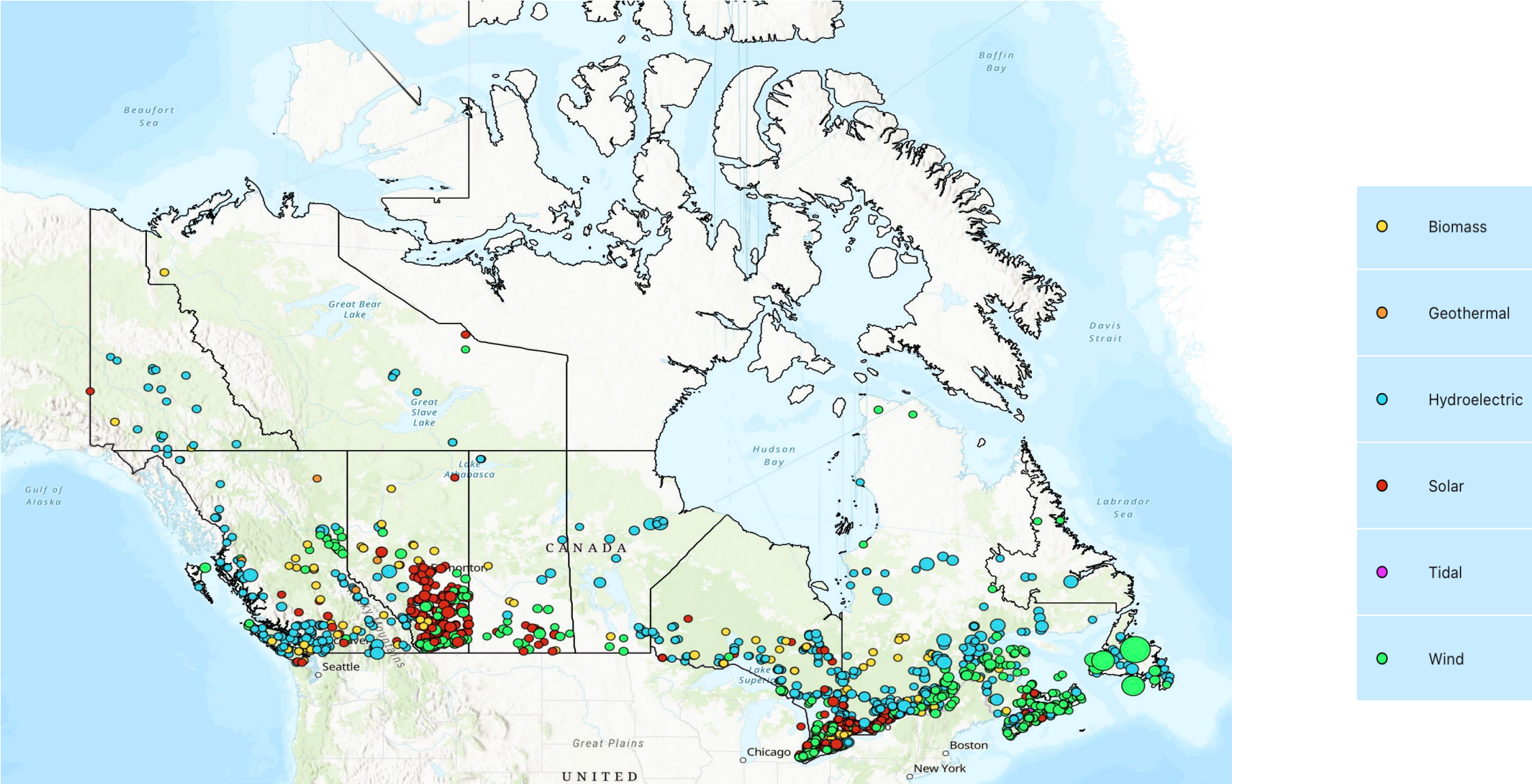
- ✓ In 2023, Canada generated 620 terawatt-hours (TWh) of electricity
- ✓ 66% (411 TWh) were from renewable sources
 - ✓ Hydroelectricity - 58%
 - ✓ Wind - 6%
 - ✓ Solar - 1%
 - ✓ Other renewable sources (e.g., biomass and geothermal) - 1%

Between 2010 and 2023...

- ✓ Total electricity generation increased by 6.6% (from 581 TWh to 620 TWh)
- ✓ Renewable generation rose by 12.6%
 - ✓ From 365 TWh to 411 TWh
- ✓ Growth was propelled by wind and solar
 - ✓ Wind: From 8.6 TWh to 40.1 TWh
 - ✓ Solar: From 0.1 TWh to 4.9 TWh

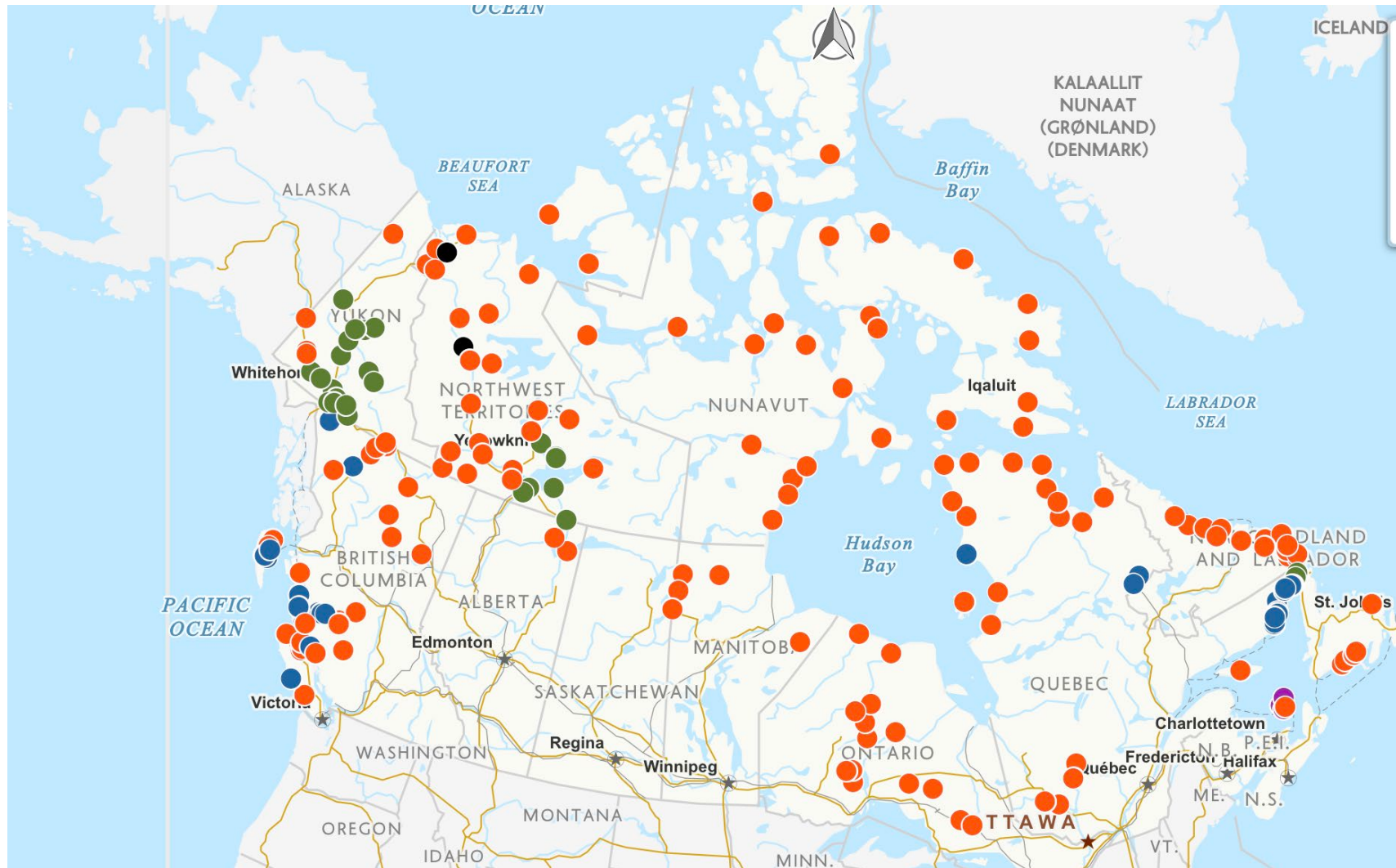
- ✓ Renewable capacity is expected to grow by 12,102 MW (11.5%) between 2024 and 2030
 - ✓ Wind projects - 7,833 MW
 - ✓ Solar - 3,019 MW
 - ✓ Hydroelectricity - 1,227 MW
- ✓ Share of total renewable energy capacity expected to be 72.9% in 2030

Canadian Renewable Energy Project Map



Source: Fejzulla et al., n.d.

Remote communities by main power source



- Diesel powered community
- Heavy fuel oil powered community
- Hydro powered community
- Natural gas powered community
- Community connected to regional grid

Source: Natural Resources Canada, 2026



- ✓ Net-zero GHG emissions by 2050
- ✓ Approximately 80% of Canada's current GHG emissions stem from energy generation and end-use

Waste management challenges from renewable energy sources (solar and wind)

- Inadequate infrastructure and facilities
- Lack of national policy frameworks
- Expensive to recycle vs disposal
- Landfill disposal
- Private organizations recycle (e.g., Sunset Renewable Asset Management and Reclaim Plastics)
- Some components managed as part of existing waste management streams (e.g. e-waste)
- Voluntary programs (solar PVs shipped to US facilities for recycling)
- Stored in facilities pending future recycling options

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- ✓ Alberta to start the country's first EPR program for solar panels on October 1, 2026
 - ✓ \$14 per panel paid by suppliers



Challenges for Indigenous, Remote, and Northern Communities

- ✓ Potential addition to legacy waste
- ✓ Pressure on already limited space for disposal
- ✓ High transportation cost
 - ✓ Geographic isolation
- ✓ Worsen existing management systems