Biomass

Organic matter like wood shavings from the forestry industry and crop residues can be used as raw material for solid or liquid biofuels.

Cost of biomass electricity[1,2]:

$$$$$

Biomass has more stable pricing than diesel—and each dollar spent goes back to your community or local forestry industry.

Waste-to-energy

Waste-to-energy systems burn garbage that would normally end up in landfills and use the resulting heat to produce energy.

Cost of waste-to-energy[3]:

$$$$$

Your existing waste collection and sorting infrastructure can help support this type of system.

Marine and hydrokinetic

Water is always moving, so underwater turbines and other devices can be used to capture energy from waves, tides and rivers.

Cost of marine and hydrokinetic energy[2]:

$$$$$ (tidal)

These systems can produce clean, reliable electricity.

Wind

The wind is incredibly powerful—and can be used to generate electricity when it spins the blades of massive wind turbines.

Cost of wind energy[2]:

$$$$$ (onshore)

In Alberta and Ontario, wind can produce electricity at less cost than natural gas.[4]

Solar

Photovoltaic and thermal solar panels use the sun's intense heat and brilliance to generate cost-effective renewable energy.

Cost of solar energy[2]:

$$$$$ (solar PV)

Solar power is already cheaper than natural gas power in Alberta—and is on track to be even less expensive by 2030.[4]

Geoenergy

Geoenergy systems pump water to hot rocks below the surface of the earth, then use the heated water as a source of energy.

Cost of geoenergy energy[2]:

$$$$$

High temperatures underground can be used for district heating and electricity generation.

Renewable energy technologies for Northern and remote communities

Remote communities across Canada are looking for ways to reduce their reliance on fossil fuels like diesel. There are several local renewable energy resources that can provide sustainable, clean, and cost-effective heat and electricity – while also generating savings and revenues, creating local jobs, reducing emissions, and avoiding harmful spills.

Want to learn more? Send us an email: oerdremoteenergy-energieadistancebrde@nrcan-rncan.gc.ca

[1] The levelized cost of electricity (LCOE) measures the lifetime costs of running an energy source divided by how much energy it produces over that span (typically in megawatt-hours).

[2] Range of LCOE in Canada according to the Canadian Energy Regulator. (2022). Canada's Adoption of Renewable Power Sources – Energy Market Analysis. https://www.cer-rec.gc.ca/en/data-analysis/energy-commodities/electricity/report/archive/2017-canadian-adoption-renewable-power/canadas-adoption-renewable-power-sources-energy-market-analysis-costs-trade-offs.html. Additional costs may apply depending on location. Refer to technology factsheet for estimated cost range

[3] Morrison Hershfield. (2011). Waste to Energy Business Case Analysis - Presented to Yukon Energy Corporation. https://emrlibrary.gov.yk.ca/yec/waste-to-energy-business-case-analysis-2011.pdf.

[4] Clean Energy Canada's A Renewables Powerhouse report (February 2023): https://cleanenergycanada.org/report/a-renewables-powerhouse.

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