

CANADIAN NATURAL GAS DEMAND TO 2030

JANUARY 2021



INTRODUCTION

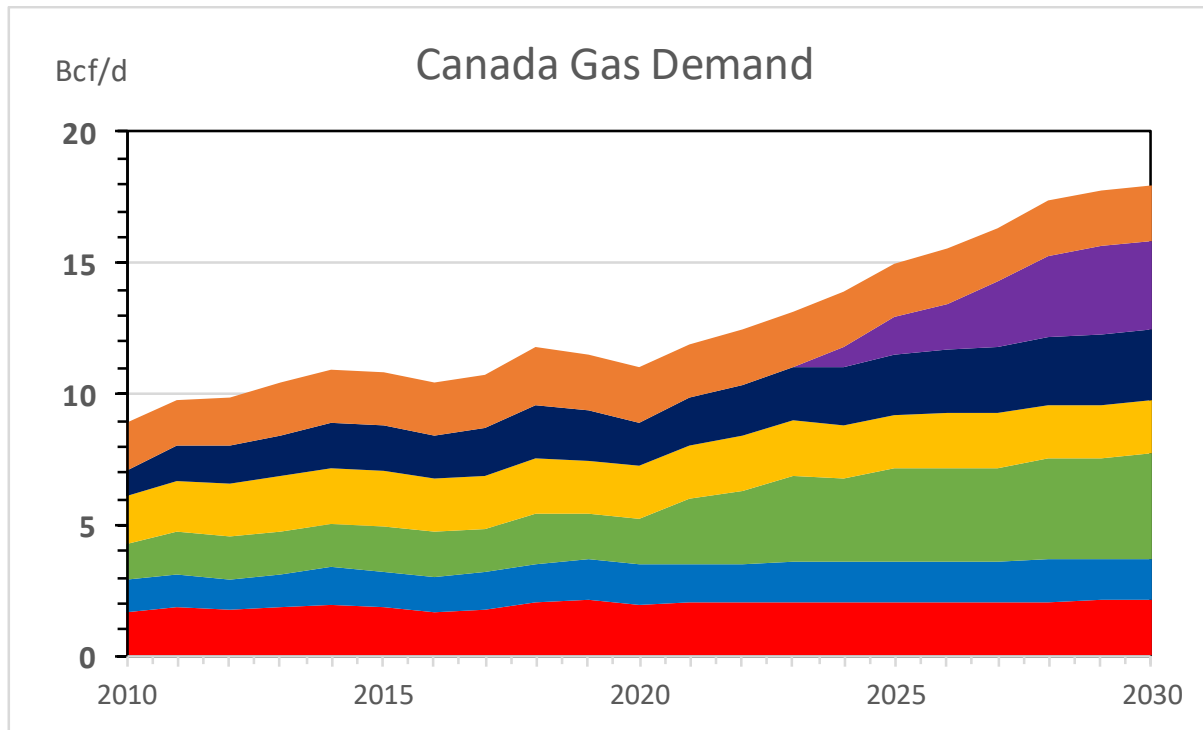
With continued development of natural gas resources, the premium for seasonal security has been reduced to near nil. The ability to bring on new production growth is now limited to ability to expand demand sources.

This analysis will review and forecast to 2030 demand for Canadian natural gas by sector:

- Core (Residential and Commercial)
- Gas-Fired Power
- Industrial (including Oil Sands and Pipeline)
- LNG Exports.



CANADA GAS DEMAND TO 2030



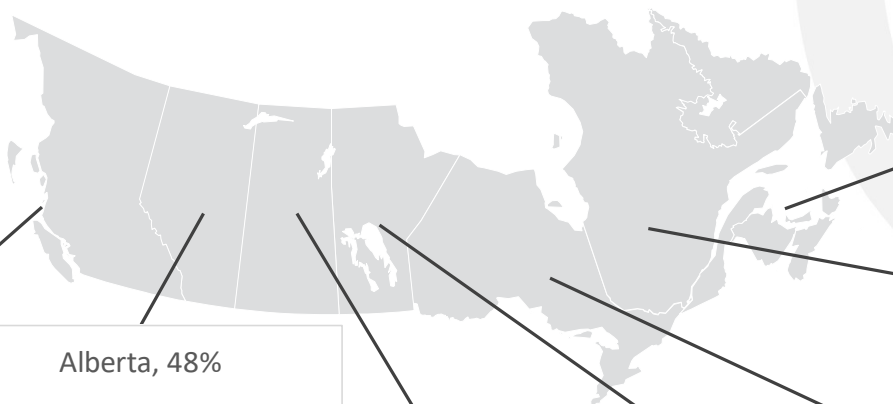
Natural Gas Demand Drivers

- LNG Exports are the largest growth driver for Canadian Demand. Completion of the LNG Canada's second train moves this sector's demand to reach 3.4 Bcf/d by 2030
- Oil Sands expansion is expected to continue to grow driving increased growth of 3.9% per year during the forecast period.
- Environment Canada Performance standard for coal-fired stations results in switching to natural gas stations and increased demand.
- Ontario Nuclear 8,000 MW Refurbishment provides increased natural gas requirements over the next decade.

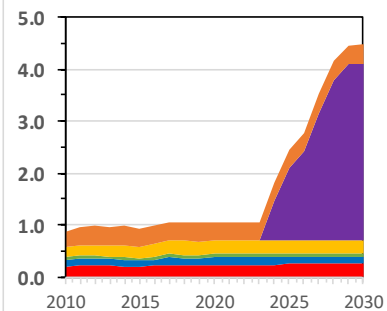
■ Residential ■ Commercial ■ Electrical ■ Industrial ■ Lease & Pipeline Fuel ■ Oil Sands ■ LNG Exports

CANADA PROVINCIAL NATURAL GAS DEMAND OUTLOOK BCF/D

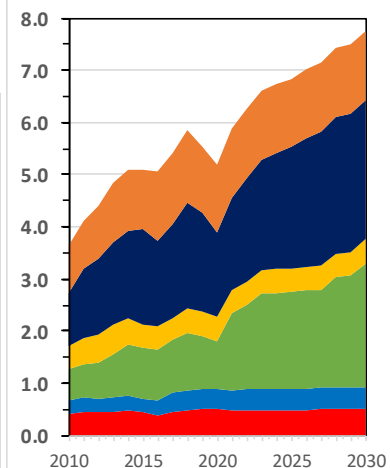
Canadian
Outlook, Bcf/d
2010 – 8.9
2020 – 11.5
2030 – 19.2
Bcf/d = billion
cubic feet per day



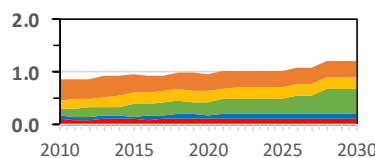
British Columbia, 9%



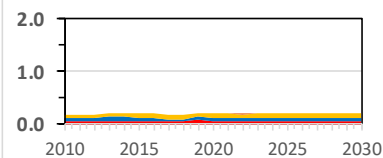
Alberta, 48%



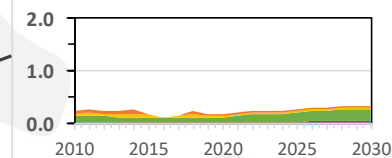
Saskatchewan, 8%



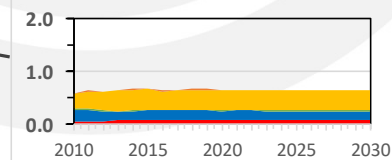
Manitoba, 2%



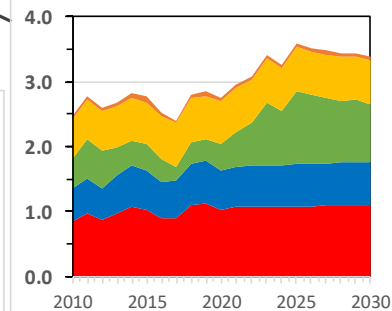
Maritimes, 2%



Quebec, 5%



Ontario, 27%



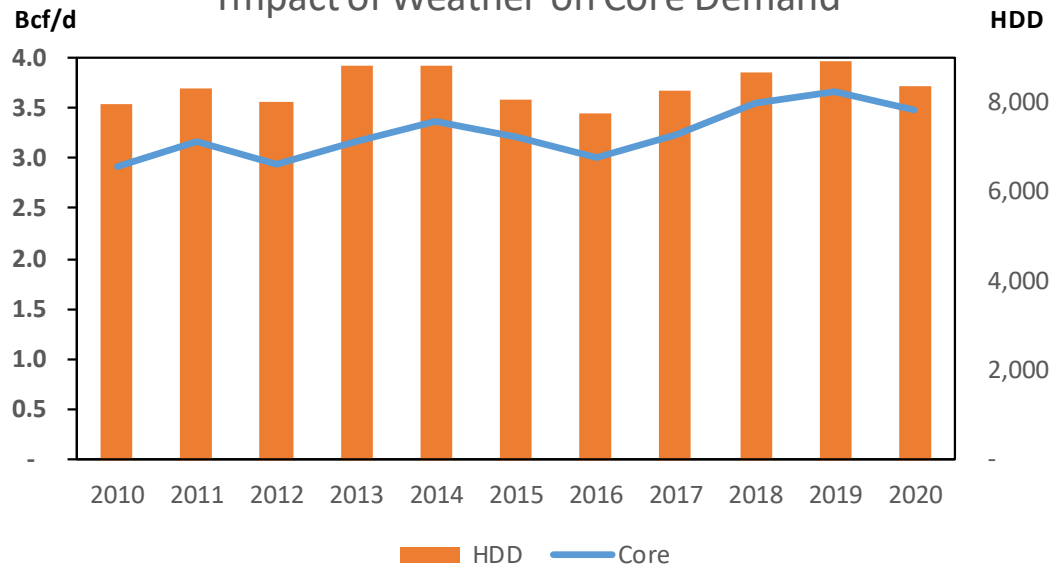
■ Residential ■ Commercial ■ Electrical ■ Industrial ■ Lease & Pipeline Fuel ■ Oil Sands ■ LNG Exports

CANADA PROVINCIAL NATURAL GAS DEMAND OUTLOOK

- The chart shows a breakdown of regional Canadian gas demand by province to 2030.
- Western Canadian provinces are expected to lead Canadian natural gas growth.
 - British Columbia growth is driven by the under-construction LNG Canada export plant.
 - Alberta power generation to replace Coal and Oil Sands expansion results in almost 2 Bcf/d of incremental natural gas requirements by 2030.
 - Saskatchewan sees Coal fired power facilities being replaced by Natural Gas stations.
- Ontario will see gas-fired generation used as a backstop for the 8,000 MW of nuclear capacity at the Bruce and Darlington sites which are being refurbished during 2016–2032 time period, and 3,000 MW at the Pickering site which will be taken out of service by 2024.

CORE DEMAND FOR NATURAL GAS

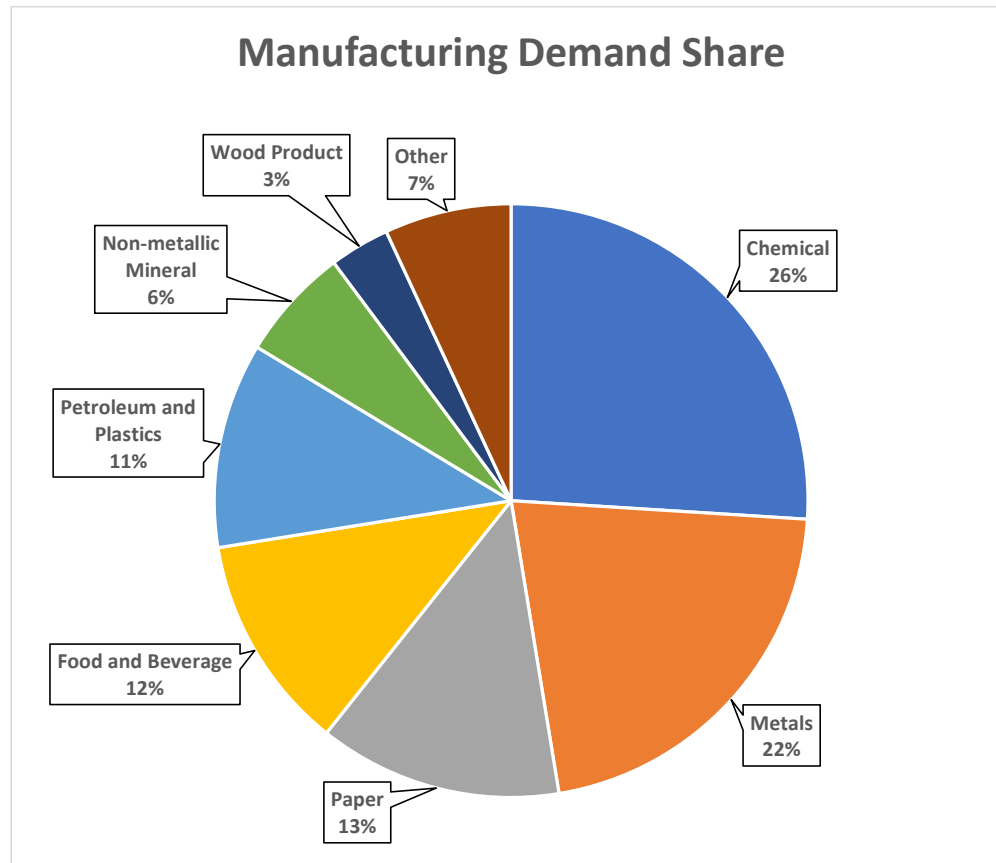
Impact of Weather on Core Demand



Core Natural Gas Demand Drivers

- Core Demand (residential and commercial sectors), where natural gas is used mainly for winter heating loads.
- As illustrated in the chart, core demand correlates well to Heating Degree Days (HDD) with yearly swings resulting.
- Customer counts drive underlying Core demand growth which tend to be partially offset by efficiency factors on a normalized basis (Mcf/Customer/HDD)
- Efficiency factors include new building standards, opportunities to use modified technology applications such as adjustable smart digital thermomotors, and conservation measures in existing housing stock (insulation, new windows).

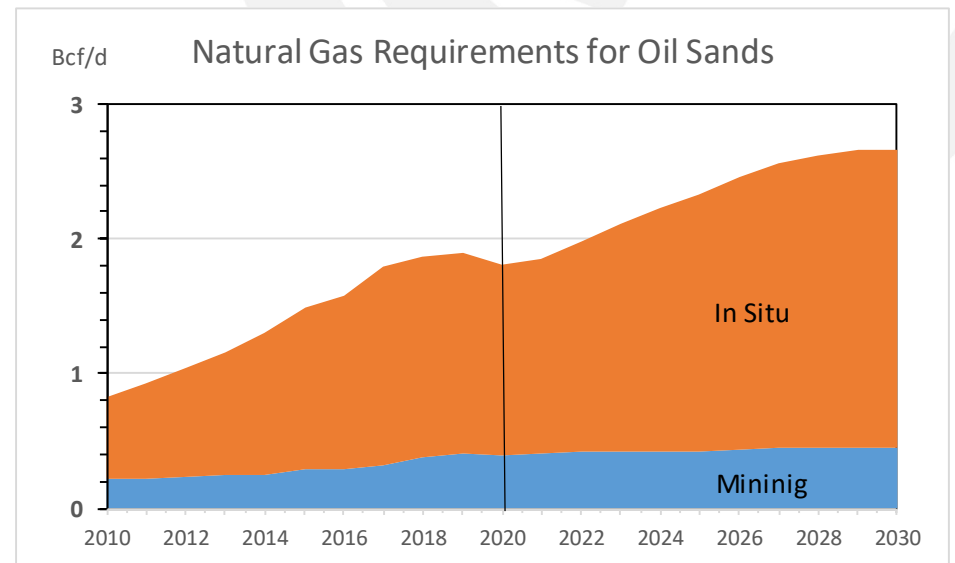
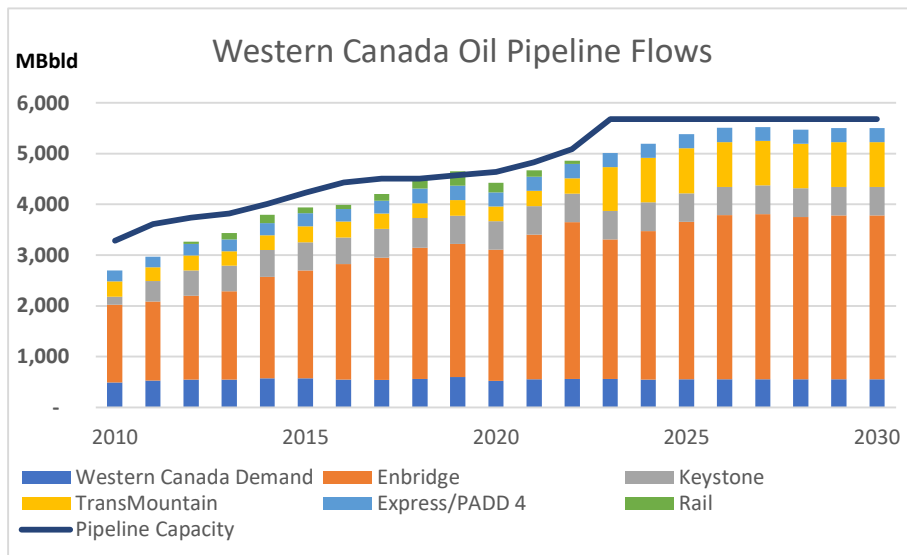
INDUSTRIAL DEMAND FOR NATURAL GAS



Industrial Demand Drivers

- Canadian Industrial Demand is about 2 Bcf/d, with four high natural gas intensity sub-sectors:
 - Chemical manufacturing (Fertilizer, Methanol) make up the largest share and tend to be the most natural gas intensive sector
 - Both fabricated and primary metals make up just under a quarter of Canadian industrial demand.
 - Paper sector at 13%, has the third largest share with natural gas making up 15-30% of input costs.
 - Petroleum and Plastics utilize natural gas as both a feedstock and process fuel.
- Natural gas in the Food and Beverage and other sectors tends to account for a minor part of overall costs (less than 10%) and are therefore inelastic to commodity price volatility.

OIL SANDS FORECAST TO 2030

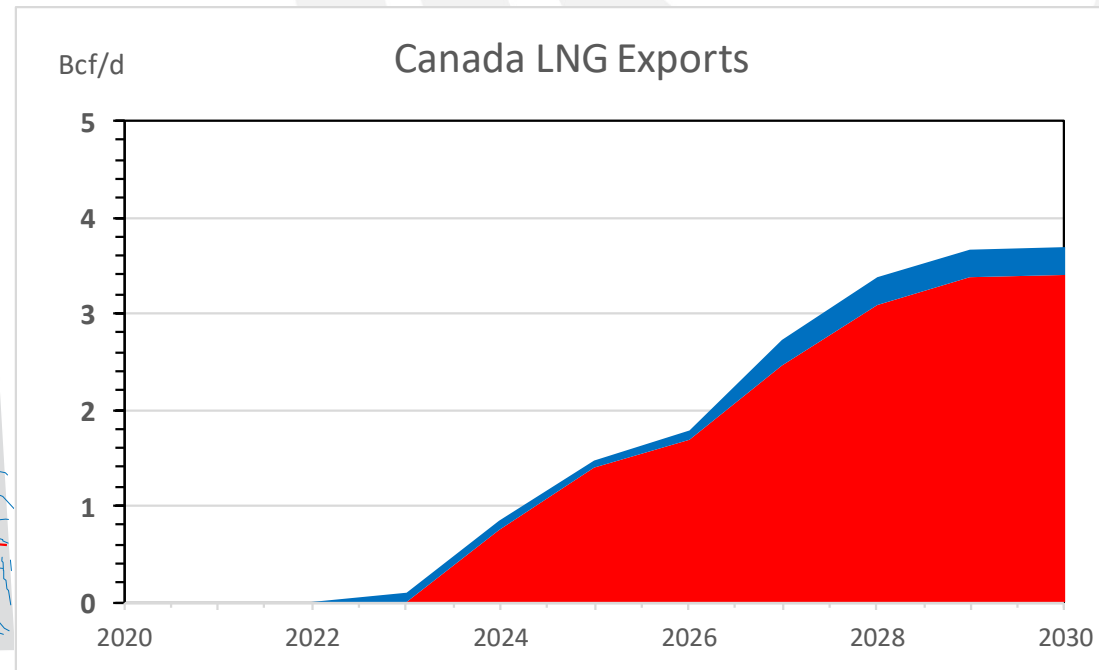
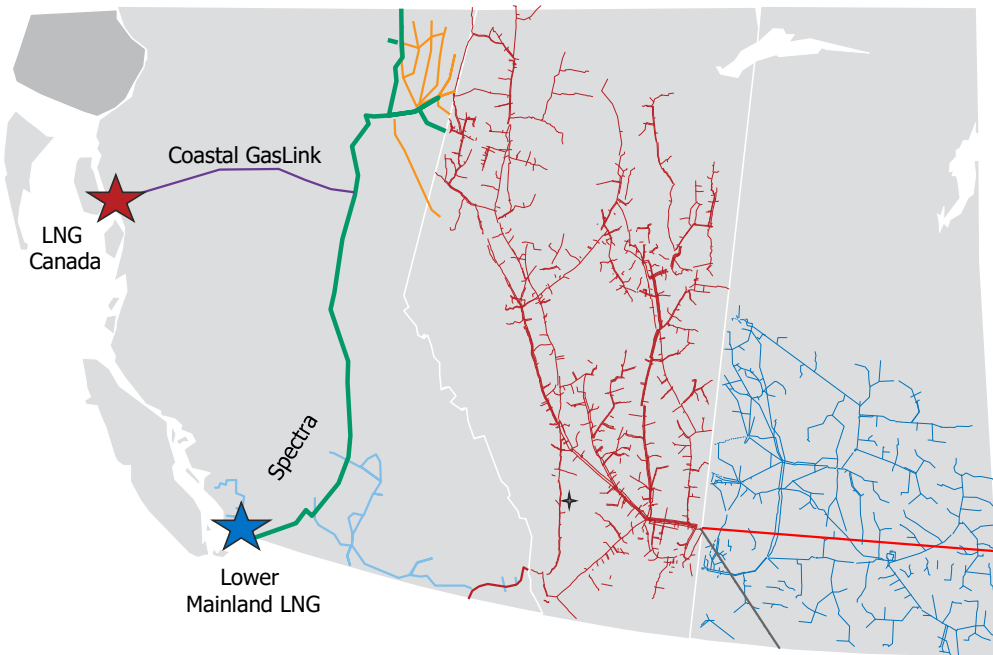


OIL SANDS FORECAST TO 2030

The chart shows total Western Canada oil supply, pipeline capacity, Alberta refinery demand, and potential pipeline expansions through 2030. Recently, oil production in excess of demand and pipeline capacity will be transported to market by rail cars. Forecast observations:

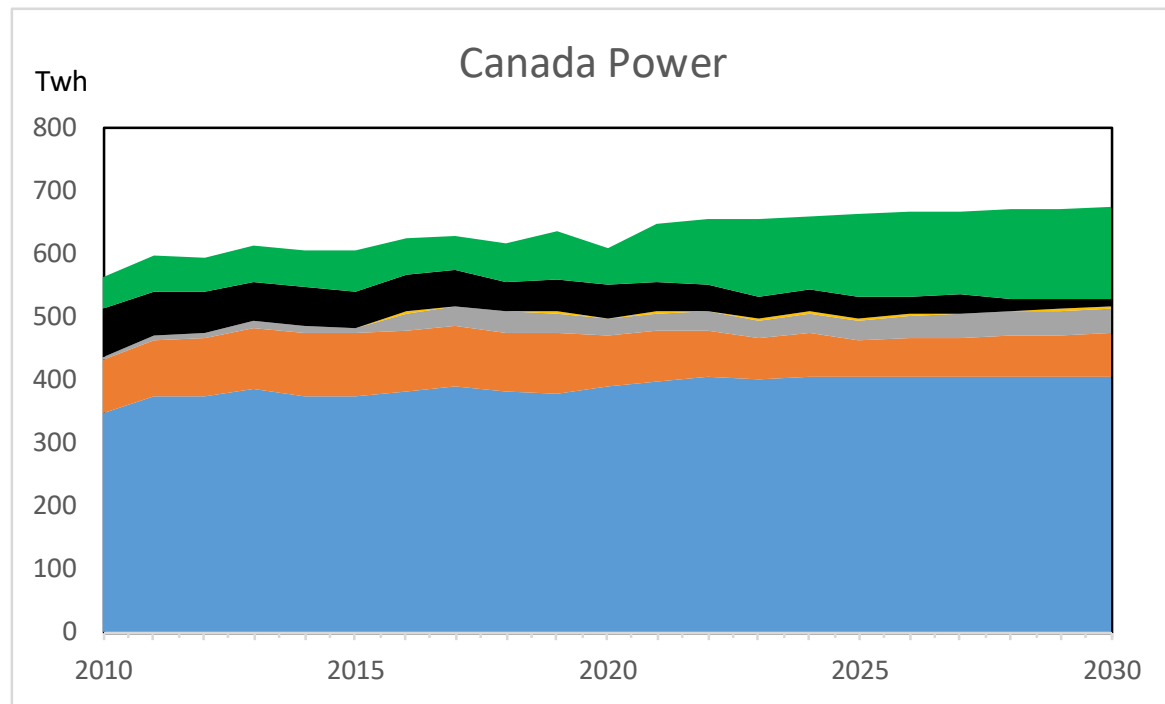
- With regulatory uncertainty and government intervention, oil sands producers have switched from business development strategy to an operations strategy. Therefore, Incorrays believes producers will take a cautious “wait and see” approach and production growth will lag pipeline developments.
- Enbridge flows are expected to increase in Q4 2021 as Line 3 comes into service.
- TransMountain Expansion completion in December 2022 diverts rail and Enbridge Midwest directed flows toward West Coast/Asian markets.
- With incremental new pipe completed in 2022, rail shipments are no longer economic.
- Incorrays forecast assumes that In Situ projects use about 1.1 Mcf/Bbl of bitumen whereas, Mining projects use 0.25 Mcf/Bbl.

CANADIAN LNG EXPORTS GROWTH



- LNG Exports are the largest growth driver for Canadian Demand. Completion of the LNG Canada's second train moves this sector's demand to reach 3.4 Bcf/d by 2030
- LNG Canada: The Shell-led 3.2 Bcf/d project is currently under construction, having received NEB export approval and both federal and provincial environmental assessment certificates. First exports are expected in 2024.
- A smaller lower mainland project is expected to begin exports in 2023 reaching 0.3 Bcf/d by 2030.

CANADA POWER GENERATION TO 2030



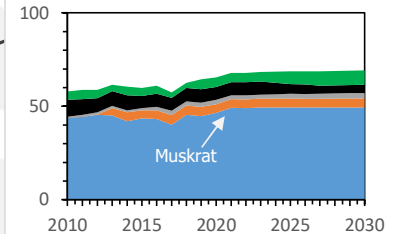
Power Generation Drivers

- Canada has an abundance of power generated from hydroelectric (60%) when compared to the US (10%) and Mexico (20%).
- Provinces generally rely on their local resource capabilities:
 - Hydroelectric in BC, Manitoba, Quebec, Newfoundland, and Ontario (to some degree).
 - Natural Gas in Alberta/Saskatchewan.
 - Nuclear in Ontario.
- Ontario plan to refurbish 8,000 MW of nuclear capacity at the Bruce and Darlington sites during 2016–2032 time period.
- Pickering site will remain in service until 2024, after which 3,000 MW will be taken out of service.

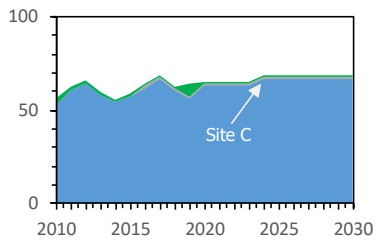
CANADA POWER DEMAND OUTLOOK TWh

Canadian
Outlook, TWh
2010 – 570
2020 – 612
2030 – 674
TWh = Terawatt
hours per year

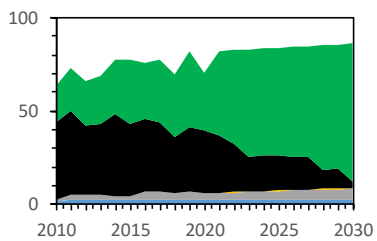
Maritimes Power, 8%



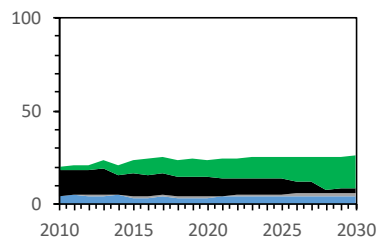
British Columbia, 10%



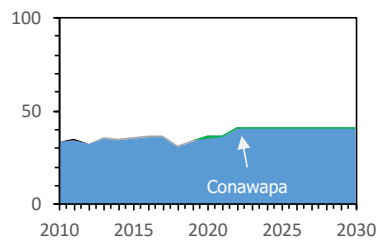
Alberta, 11%



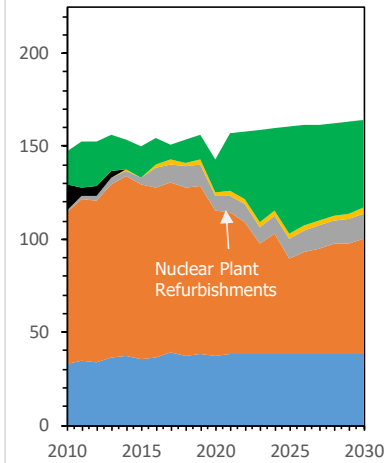
Saskatchewan, 4%



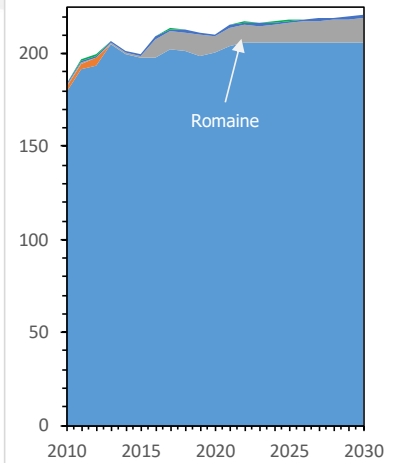
Manitoba, 6%



Ontario Power, 23%

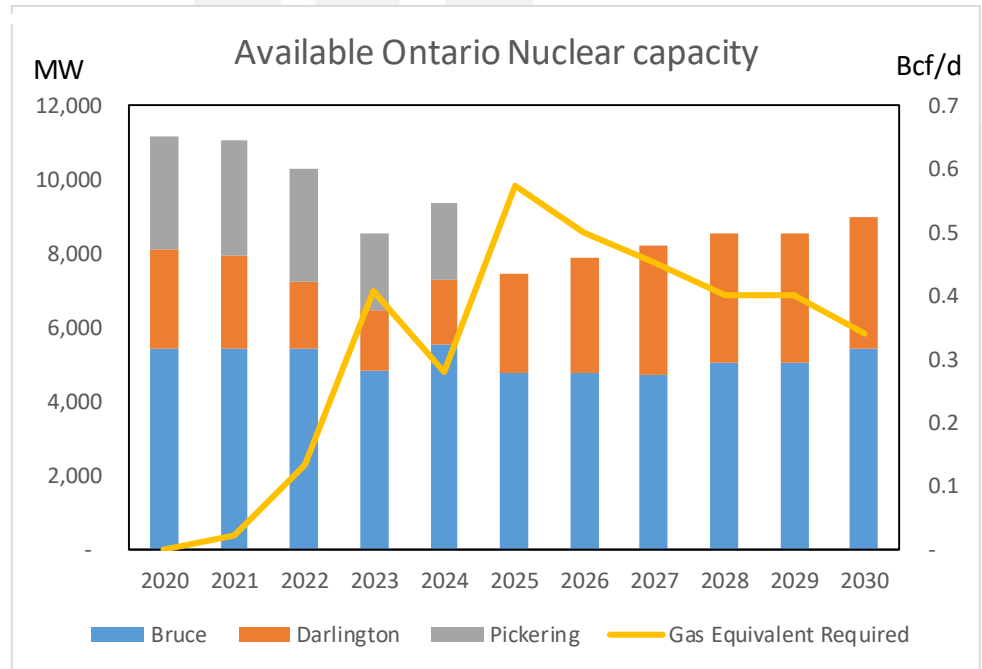
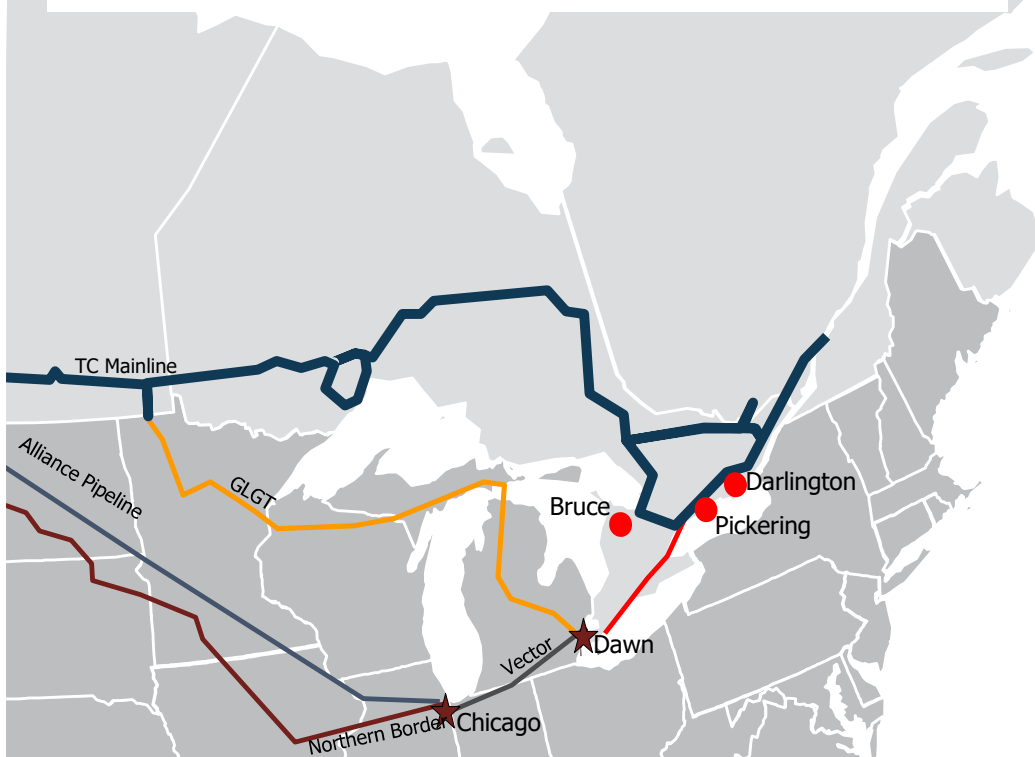


Quebec Power, 34%



ONTARIO NUCLEAR REFURBISHMENT

Natural Gas Pipelines and Ontario Nuclear Stations



- Ontario plan to refurbish 8,000 MW of nuclear capacity at the Bruce and Darlington sites during 2016–2032 time period.
- Pickering site will remain in service until 2024, after which 3,000 MW will be taken out of service.
- Natural Gas is expected to backstop Nuclear during refurbishment.



THANK YOU !

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