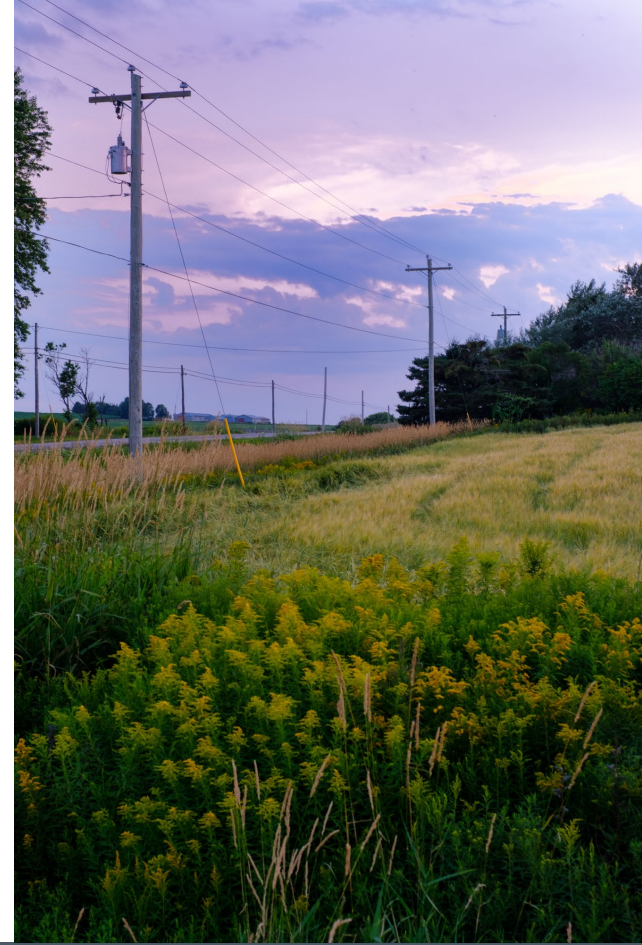


Maritime Electric Load Forecast Overview

Island Regulatory and Appeals Commission
September 9, 2022

Agenda

- Overview of Maritime Electric sales
- Residential portion of forecast model
- Impact of variability in Heating Degree Days (HDD)
- Impact of COVID
- Impact of high furnace oil prices
- Commercial portion of forecast model
- Other forecast inputs



Overview of Sales Forecast Model

Forecast Model Component	External Drivers
Residential – space heating	- Population growth – CBOC
Residential – non-space heating	<ul style="list-style-type: none">- Population growth – CBOC- DSM projection- EV charging- Rooftop solar
Commercial ¹	<ul style="list-style-type: none">- Gross domestic product – CBOC- DSM projection
Large Industrial	- New loads
Street Lighting	- LED conversion

¹ Commercial includes General Service, Small Industrial and Unmetered

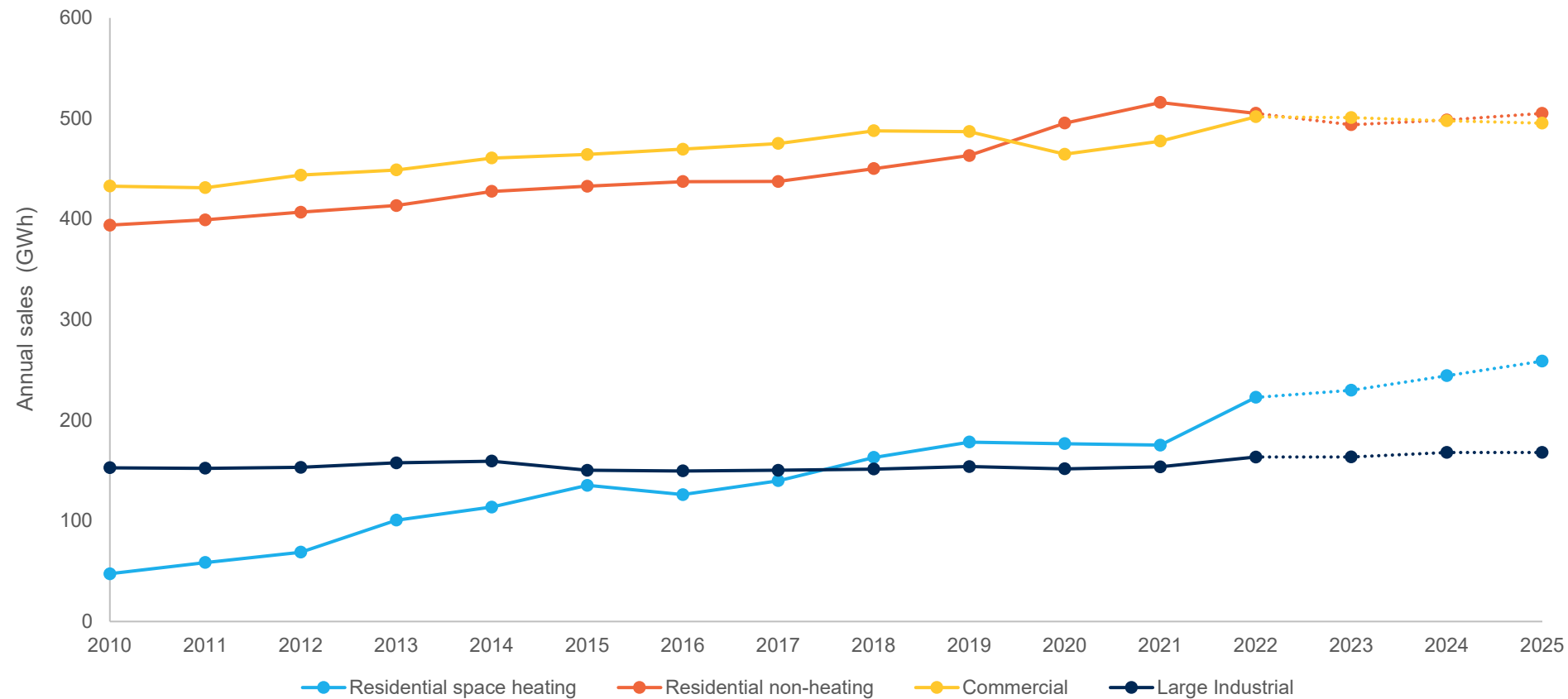
Main Drivers of Load Growth

- Load growth due primarily to Residential sales.
- Growth in Residential sales is driven by a shift to electric heat and an increase in population (immigration).
- Commercial load has also grown, but to a lesser extent.
- Large Industrial load is mainly one customer, which has had a stable load.





Energy Sales Highlight Growth in Space Heating





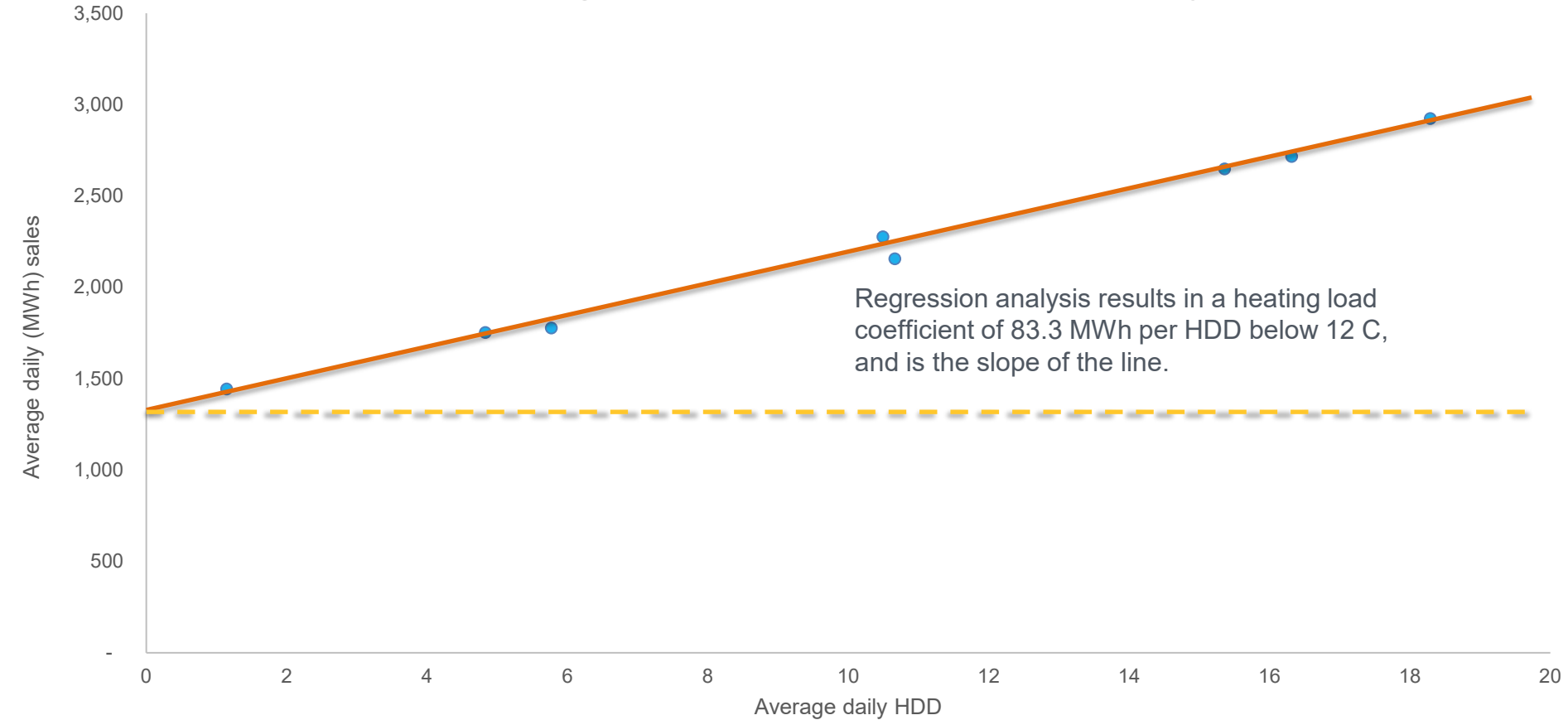
Estimating Residential Space Heating Load

- Estimated using a regression analysis of monthly Residential MWh sales and Heating Degree Days (HDD).
- October to May analysis provides an average value of the coefficient for the heating season.
- The estimate is equal to one of the coefficients of the regression analysis, expressed in terms of MWh per HDD.
- The heating load for a year is MWh per HDD coefficient x the annual HDD.





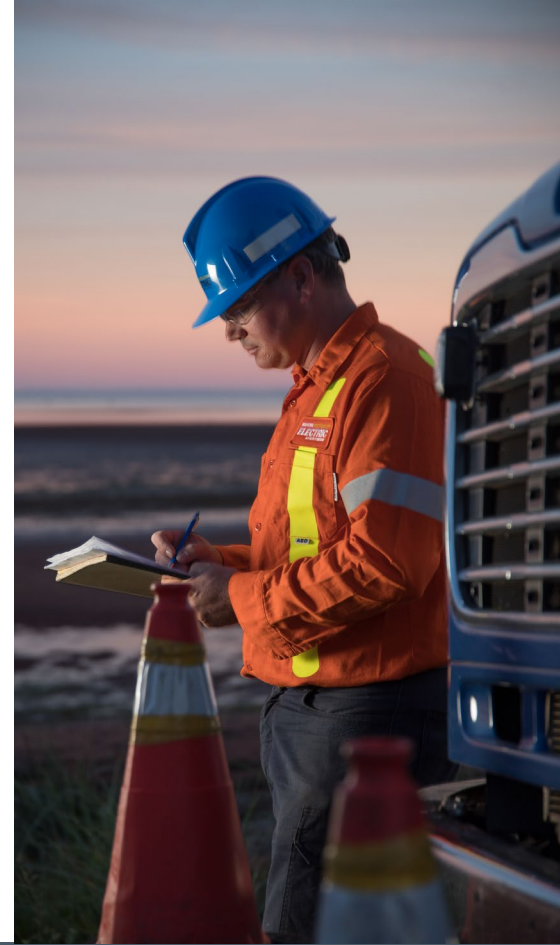
Residential Heating Load Coefficient for October 2021 to May 2022





Impact of Population Growth

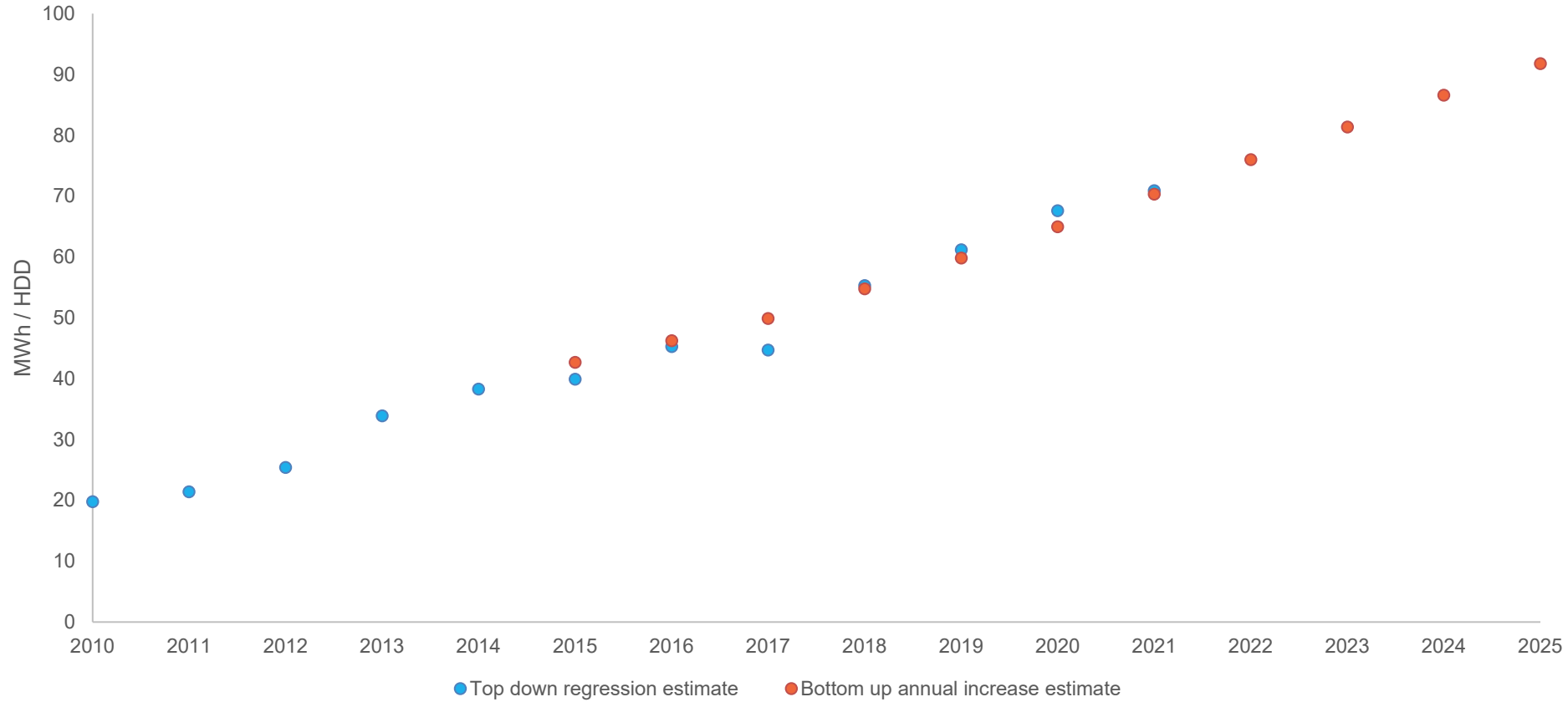
- Conference Board of Canada's population growth projection is converted into housing starts.
- Housing starts broken down by housing type – single-family detached, semi-detached, multi-family, etc.
- An analysis of kWh sales for recent new Residential construction, by housing type, provides the average annual usage for space heating and non-space heating loads.
- Current growth in Residential space heating load equates to an annual increase in the HDD coefficient of approximately 5 MWh per HDD.



2023 Forecast Residential Space Heating Load

	Total Estimated Housing Starts A	MECL Portion B	Electric Heat Portion C	Annual Average Usage (kWh) D	Annual Sales Growth (MWh) E = AxBxCxD
Single Detached	458	95%	80%	8,500	2,959
Semi Detached	172	90%	95%	7,400	1,088
Multi-unit	515	90%	90%	3,400	1,418
Mobile Homes	80	100%	90%	6,400	461
Cottages	100	100%	50%	2,900	145
200 Amp Upgrade	190	100%	50%	6,500	618
Mini-split Retrofit	1,733	100%	100%	4,700	8,145
Total					14,834
14,834 MWh / 2,774 HDD = 5.3 MWh per HDD					

Residential Space Heating Load Coefficient

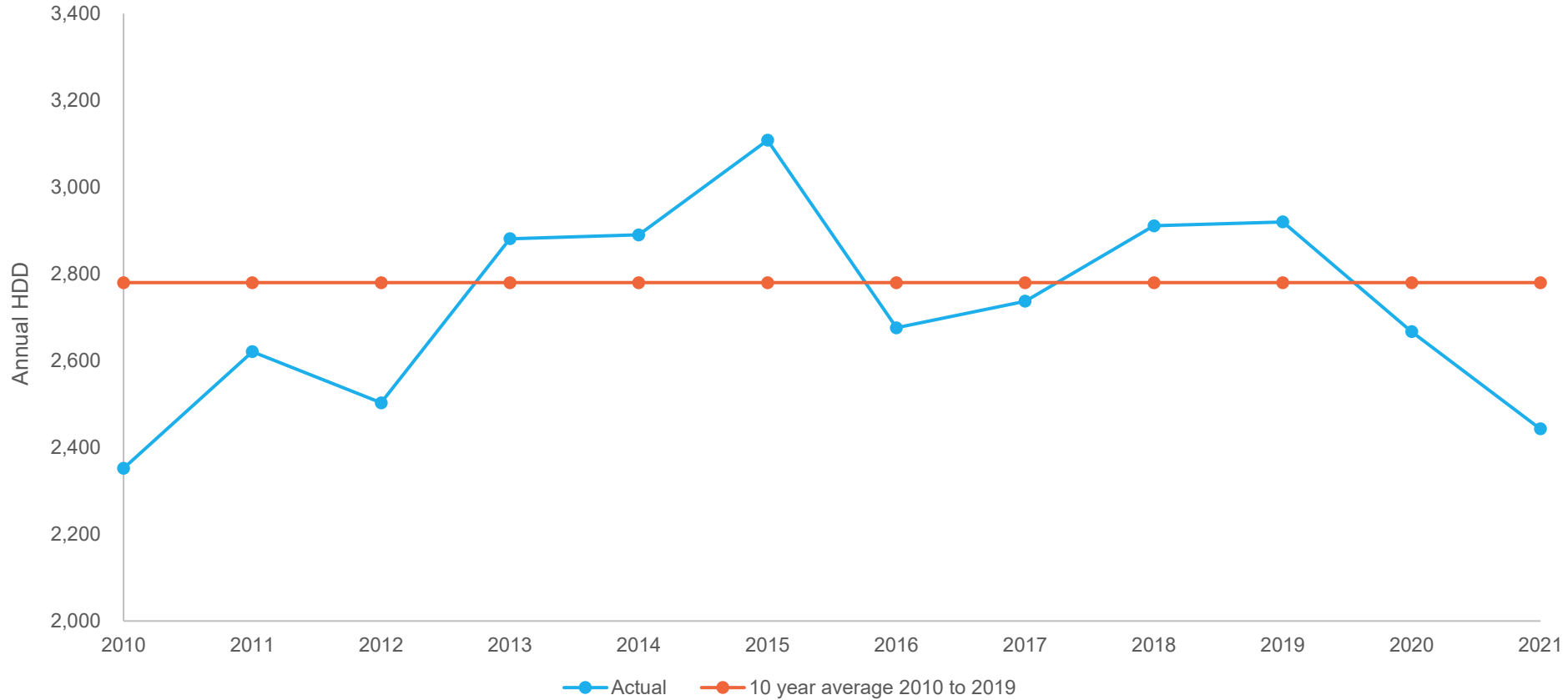


Variability in HDD = Variability in Sales

- “Normal” annual HDD, using the 10-year average HDD value, used when forecasting Residential space heating load.
- Average HDD below 12 C was 2,774 per year for 2012 to 2021.
- An increase or decrease of 200 HDD, compared to 10-year average, equates to a deviation of 1.1% in kWh sales from forecast.
- A deviation of 1.1% from forecast is significant when total sales are forecast to grow by 1.5% to 2% annually.



Annual Heating Degree Days Below 12 Degrees C



Impact of COVID

- In 2020 and 2021, General Service sales decreased (temporary closures) and Residential sales increased (working from home).
- The GRA forecast assumed that these loads would return to pre-COVID trends in 2022.
- However, the GRA forecast was prepared in November 2021 before the restrictions were re-imposed in December 2021.
- Therefore, General Service and Residential sales are now expected to fully return to pre-COVID trends in 2023 as per GRA forecast.





Negative Load Growth Expected for 2023

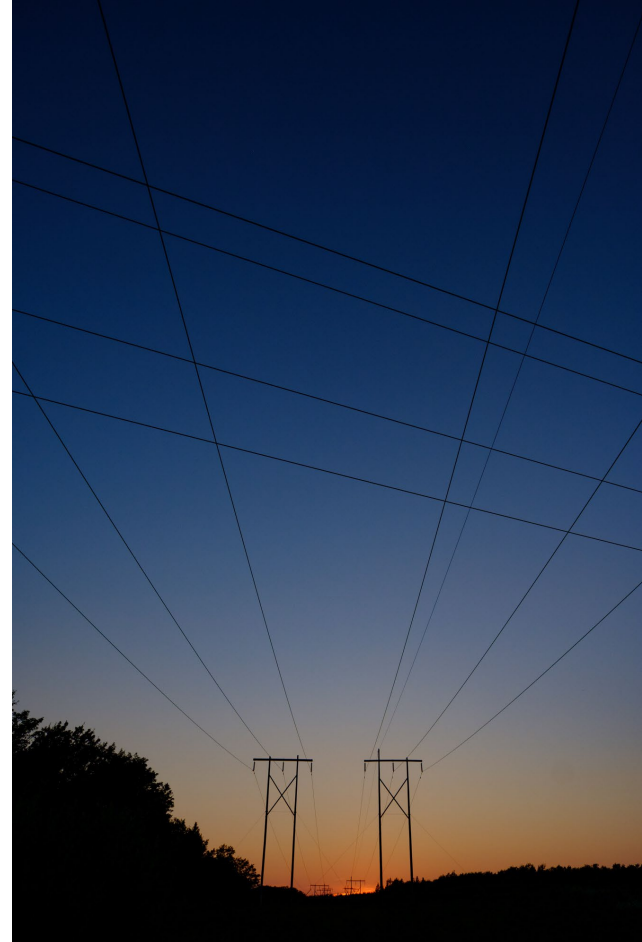
- 2023 sales expected to be slightly lower than those forecast for 2022 (i.e., negative load growth).
- YTD sales for 2022 have been much higher than expected, driven by space heating load.
- Sales for YTD March 2022 was 11.3% higher than the same period for 2021, as compared to a forecast increase of only 3.4% for 2022.
- Regression analysis for October 2021 to March 2022 resulted in a coefficient of 84.8 MWh per HDD, up 14.5 MWh per HDD over the previous year increase of 5.3 MWh per HDD.
- Residential customers apparently resorted to measures such as plug-in electric heaters, in response to high furnace oil prices.

Residential Space Heating Load Coefficient



GRA Sales Forecast - Filed in June 2022

- In April 2022, Maritime Electric chose not to revise the GRA sales forecast based on the following:
 - Furnace oil prices were assumed to moderate. Therefore, the surge in electricity usage in early 2022 to reduce furnace oil usage should be temporary.
 - Revising the sales forecast would have the greatest impact on 2022 forecast sales, with minimal impact on the rate-setting period of 2023 to 2025.
 - Revising the sales forecast for 2023 to 2025 would have delayed the GRA filing.



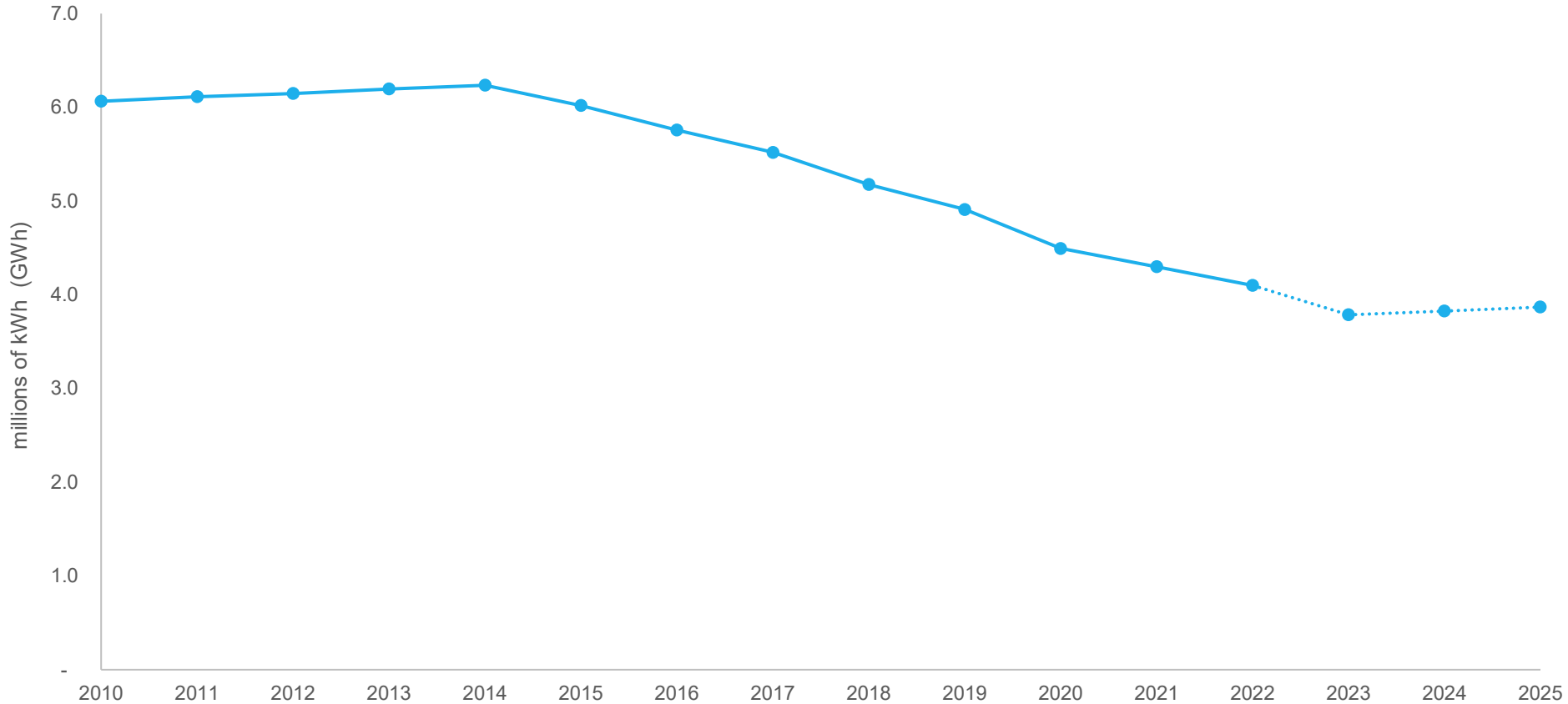


Estimating Commercial Sales

- Regression analysis used on historical annual sales, incorporating historical annual real Gross Domestic Product on PEI, as per the Conference Board of Canada.
- Real price of electricity has also been used as an input variable in the past, but no longer because of low statistical significance.
- General Service sales increases due to 1.4% GDP is largely offset by reductions due to efficiencyPEI's DSM programs.



Street Lighting Energy Sales



Estimated incremental annual DSM energy savings

- GRA Forecast was prepared before efficiencyPEI's 2nd Three-Year DSM Plan was available
- Therefore, DSM energy reduction based on the Business As Usual scenario in the PEI Energy Efficiency Potential Study by Dunskey Consulting
- Result is Maritime Electric's assumed DSM energy reduction is more aggressive than efficiencyPEI's most recent plan.



Comparison to efficiencyPEI's DSM Energy Incremental Annual Reductions

	Assumed in GRA Forecast (GWh)			efficiencyPEI 2 nd Three-Year Plan (GWh)			Total Variance
	Residential	Commercial	Total	Residential	Commercial	Total	
2022	(5.9)	(6.9)	(12.9)	(8.5)	(2.7)	(11.2)	(1.7)
2023	(6.9)	(7.6)	(14.3)	(7.0)	(2.8)	(9.7)	(4.6)
2024	(6.7)	(7.6)	(14.3)	(7.2)	(2.9)	(10.1)	(4.2)
2025	(6.1)	(6.9)	(13.0)				



Other Inputs - Electric Vehicle Charging

- EV charging energy forecast based on a forecast EV growth in New Brunswick prorated for PEI population.
- Assuming 2 kWh EV battery = 1 litre of gasoline => annual EV usages ~ 3,000 kWh.
- Forecast assumes number of electric vehicles will increase by 400 in 2023, which equals a sales increase of 1.2 million kWh (1.2 GWh)





Other Inputs - Residential Rooftop Solar

- Forecast assumes 480 new installations in 2023, which contributes an annual generation of 4 million kWh (4 GWh), and number of installations assumed to slow in 2024.
- On average, 1/3 of solar generation used to supply owner/customer load, and represents a reduction in utility sales.
- The other 2/3 of solar generation delivered to the utility as a source of energy supply. This energy source displaces energy purchased from NB Power.





Thank You