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1 Q. Please provide Hydro's fuel unit conversion documentation utilized to convert the prices of  
2 the various fuels used by Hydro's thermal and gas turbine assets into equivalent prices for  
3 energy production (e.g., \$/MWh).

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6 A. PUB-NLH-045, Attachment 1 provides an Excel fuel conversion document used to convert  
7 Newfoundland and Labrador Hydro's forecast fuel prices for its various fuel types into input  
8 parameters that can be used in PLEXOS. The process begins with the fuel series forecast in  
9 CDN\$ per litre provided in the Corporate Assumptions developed by Nalcor's Investment  
10 Evaluation group. The price per litre is then converted to a price per gigajoule, using the  
11 formulas as provided in Attachment 1.

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13 PLEXOS uses the forecast price per gigajoule and the unit's heat rate to determine which  
14 resources are required to meet customer requirements, in economic dispatch order. For  
15 completeness, the heat rates of Newfoundland and Labrador Hydro's units are also  
16 provided in PUB-NLH-045, Attachment 1. The combination of the heat rate and fuel series  
17 forecast are all used by PLEXOS to determine the equivalent price for energy production  
18 (\$/MWh).



Fuel Price From Corporate Assumptions<sup>1,2</sup>

	Holyrood & Hardwoods	Stephenville	Happy Valley	Holyrood No. 6
	\$/CDN/L	\$/CDN/L	\$/CDN/L	\$/CDN/BBL
2018	0.875	0.943	1.255	89.4
2019	0.915	0.982	1.347	87.8
2020	1.110	1.178	1.495	83.3
2021	1.020	1.088	1.405	82.0
2022	0.970	1.038	1.355	82.4
2023	0.960	1.028	1.345	82.3
2024	0.970	1.038	1.365	82.4
2025	0.980	1.048	1.380	85.3
2026	0.995	1.063	1.405	
2027	1.015	1.083	1.435	
2028	1.030	1.098	1.455	
2029	1.045	1.113	1.480	

<sup>1</sup>. Post 2023 extended from existing corporate assumptions for Stephenville and Happy-Valley based on Holyrood and Hardwoods fuel series. Published Corporate Assumptions cover period to 2023 for Stephenville and Happy Valley.

<sup>2</sup>. Barrel ("bbl").

Plexos Input<sup>3</sup>

	Holyrood & Hardwoods	Stephenville	Happy Valley	Holyrood No. 6
	\$/GJ	\$/GJ	\$/GJ	\$/GJ
2018	22.636	24.395	32.466	13.478
2019	23.670	25.404	34.846	13.236
2020	28.715	30.474	38.674	12.558
2021	26.387	28.146	36.346	12.362
2022	25.093	26.852	35.053	12.422
2023	24.834	26.594	34.794	12.407
2024	25.093	26.852	35.311	12.422
2025	25.352	27.111	35.699	12.859
2026	25.740	27.499	36.346	
2027	26.257	28.016	37.122	
2028	26.645	28.404	37.640	
2029	27.033	28.792	38.286	

<sup>3</sup>. Gigajoule ("GJ").

Conversion Assumptions<sup>4</sup>

Holyrood No. 6 Heat Content	6.287 MMBtu/bbl
Gas Tubine #2 Heat Content	5.825 MMBtu/bbl
Barrels -> Liters	158.987 L/bbl
MMbtu -> GJ	0.9478 MMBtu/GJ
<b>Unit heat rates:</b>	
Holyrood Thermal Plant	
at minimum unit loading	10.96 GJ/MWh
at maximum unit loading	10.32 GJ/MWh
Holyrood Gas Turbine	15.74 GJ/MWh
Hardwoods Gas Turbine	19.79 GJ/MWh
Stephenville Gas Turbine	21.71 GJ/MWh
Happy-Valley Gas Turbine	11.97 GJ/MWh

<sup>4</sup>. One million British Thermal Units ("MMBtu")