Part and Chapter:	PUB/MH II-33b Attachment 1	**Page #:**	
Topic:	Probabilistic Risk Assessment		
Subtopic			

PREAMBLE:

Manitoba Hydro presents the results of its Monte Carlo probabilistic risk assessment against the 2-Medium Load Projection.

QUESTION:

Please provide a revised Monte Carlo probabilistic risk analysis assessing risks against the 2024 Electric Load Forecast, including a revised S-Curve graph and Supply/Demand Table presenting the 2024 Electric Load Forecast.

RATIONALE FOR QUESTION:

To assess Manitoba Hydro's probabilistic risk factor against its most recent electric load forecast.

RESPONSE:

Manitoba Hydro is providing the full uncertainty (including the three load projections) against the 2024 Electric Load Forecast. This is consistent with how the original analysis was presented against the 2-Medium load projection but still included the load uncertainty in the analysis.

This is the appropriate way of analyzing the risk/uncertainty. Please refer to PUB-MH II-33b for details regarding the methodology used to perform the Monte Carlo probabilistic risk analysis. Manitoba Hydro provides below Figures 1 through 3 as the revised figures of the Monte Carlo probabilistic risk analysis.

Winter	Risk-Adjusted Probability of Deficit, with 750 MW CTs	Risk-Adjusted Probability of Deficit, with 500 MW CTs	Risk-Adjusted Probability of Deficit, with 250 MW CTs	Risk-Adjusted Probability of Deficit, with no new CTs
2030/31	32%	72%	96%	>99%
2031/32	37%	68%	94%	>99%
2032/33	40%	75%	95%	>99%
2033/34	37%	74%	93%	>99%
2034/35	41%	82%	97%	>99%
2035/36	33%	67%	95%	>99%

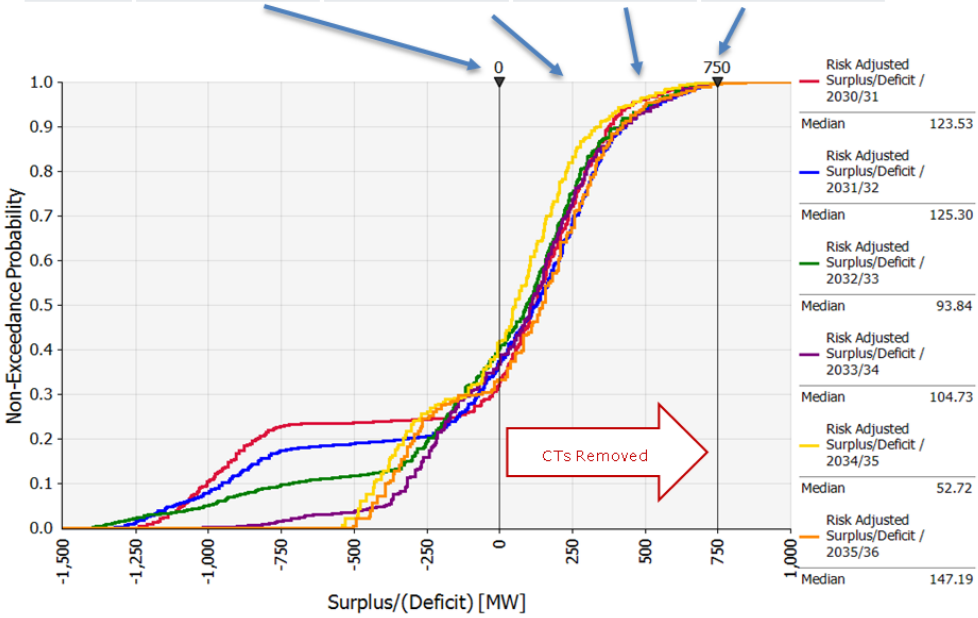

Figure 1: Cumulative distributions of planning surplus/deficit by year 2030/31 to 2035/36

System Firm Winter Peak Demand and Capacity Resources (MW) 2025 MNF Assumptions - 2024 Electric Load Forecast Recommended Development Plan																					
Fiscal Year		2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35	2035/36	2036/37	2037/38	2038/39	2039/40	2040/41	2041/42	2042/43	2043/44	2044/45
Supply																					
New Power Resources																					
1 **Total New Hydro**		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2 **Total New Thermal**		0	0	0	0	0	744	744	744	744	744	744	744	744	744	744	744	744	744	744	744
3 **Total New Wind**		0	0	0	0	40	40	80	80	111	111	111	111	114	114	120	120	120	120	120	140
4 **Total New Batteries**		0	0	0	0	0	0	0	0	0	5	5	5	5	5	5	5	5	5	5	5
5 **Total New Power Resources**	1+2+3+4	**0**	**0**	**0**	**0**	**40**	**784**	**824**	**824**	**855**	**860**	**860**	**860**	**863**	**863**	**869**	**869**	**869**	**869**	**869**	**889**
Base Supply Power Resources																					
Existing and Committed Hydro		5754	5793	5812	5812	5808	5814	5814	5814	5814	5814	5814	5814	5814	5814	5814	5814	5814	5814	5814	5814
Existing Thermal		278	278	278	278	278	278	278	278	278	278	278	278	278	278	278	278	278	278	278	278
Existing Independent Power		52	52	52	52	52	52	31	31	31	31	31	31	28	28	0	0	0	0	0	0
Scheduled Outages		-150	-150	-150	-150	-150	-300	-300	-300	-300	-300	-300	-300	-200	-200	-200	-200	-150	-150	-150	-150
Contracted Imports		700	700	650	650	650	200	200	200	200	200	100	0	0	0	0	0	0	0	0	0
6 **Total Base Supply Power Resources**		**6634**	**6673**	**6642**	**6642**	**6638**	**6045**	**6024**	**6024**	**6024**	**6024**	**5924**	**5824**	**5920**	**5920**	**5893**	**5893**	**5943**	**5943**	**5943**	**5943**
7 **Total Power Resources @ Point of Supply**	5+6	**6634**	**6673**	**6642**	**6642**	**6678**	**6829**	**6848**	**6848**	**6879**	**6884**	**6784**	**6684**	**6783**	**6783**	**6762**	**6762**	**6812**	**6812**	**6812**	**6832**
Demand																					
2024 Electric Load Forecast		4793	4927	5003	5061	5120	5181	5253	5332	5429	5540	5657	5779	5903	6031	6161	6293	6454	6644	6842	7012
Efficiency Manitoba's 2024 Update of the DSM Forecast		-62	-87	-117	-149	-181	-215	-249	-285	-322	-361	-402	-441	-481	-522	-566	-606	-630	-676	-724	-766
2024 Demand Response Forecast		0	0	0	-10	-23	-65	-96	-129	-137	-147	-161	-179	-181	-183	-186	-137	-137	-190	-190	-194
New Selectable DSM		0	0	0	-6	-14	-22	-31	-45	-63	-88	-95	-150	-163	-175	-187	-199	-211	-221	-358	-479
2024 Curtailable Rate Program Option A Forecast		-151	-151	-151	-151	-151	-151	-151	-151	-151	-151	-151	-151	-151	-151	-151	-151	-151	-151	-151	-151
Manitoba Net Load @ Common Bus		4580	4689	4735	4745	4750	4728	4726	4722	4755	4793	4849	4858	4927	4998	5071	5200	5325	5405	5418	5422
Manitoba Transmission Losses		284	293	294	295	293	253	251	241	242	245	251	252	259	267	278	294	310	321	322	320
8 **Manitoba Net Load @ Point of Supply**		**4864**	**4982**	**5028**	**5040**	**5044**	**4981**	**4976**	**4963**	**4997**	**5038**	**5100**	**5110**	**5186**	**5265**	**5349**	**5494**	**5635**	**5726**	**5740**	**5742**
Contracted Exports		813	813	743	667	672	565	565	615	615	615	365	365	365	365	365	265	265	265	265	265
Total Exports @ Border		813	813	743	667	672	565	565	615	615	615	365	365	365	365	365	265	265	265	265	265
Export Transmission Losses		14	15	13	2	3	45	45	50	50	51	32	45	47	48	49	36	38	41	41	41
9 **Total Exports @ Point of Supply**		**827**	**828**	**756**	**669**	**675**	**610**	**610**	**665**	**665**	**666**	**397**	**410**	**412**	**413**	**414**	**301**	**303**	**306**	**306**	**306**
10 **Total Peak Demand @ Point of Supply**	8+9	**5692**	**5810**	**5785**	**5709**	**5719**	**5592**	**5586**	**5628**	**5662**	**5704**	**5497**	**5520**	**5598**	**5678**	**5763**	**5795**	**5939**	**6031**	**6046**	**6048**
11 **Planning Reserves @ Point of Supply**		**585**	**600**	**605**	**605**	**606**	**603**	**603**	**602**	**606**	**611**	**616**	**619**	**628**	**638**	**648**	**664**	**681**	**692**	**694**	**694**
12 **System Surplus/Deficit @ Point of Supply**	7-10-11	**357**	**264**	**252**	**328**	**354**	**633**	**659**	**618**	**611**	**569**	**672**	**545**	**558**	**467**	**351**	**303**	**192**	**88**	**72**	**90**
13 **Incremental P50 Risk adjustment**		**-96**	**-118**	**-247**	**-355**	**-465**	**-510**	**-534**	**-525**	**-507**	**-517**	**-524**	**-451**	**-464**	**-478**	**-486**	**-505**	**-374**	**-378**	**-425**	**-503**
14 **Risk Adjusted System Surplus/Deficit**	12+13	**261**	**146**	**5**	**-27**	**-111**	**124**	**125**	**94**	**105**	**53**	**147**	**94**	**93**	**-11**	**-135**	**-201**	**-182**	**-289**	**-353**	**-414**

Figure 2: System Firm Winter Peak Demand and Capacity Resources (MW) including Risk Adjusted System Surplus/Deficits

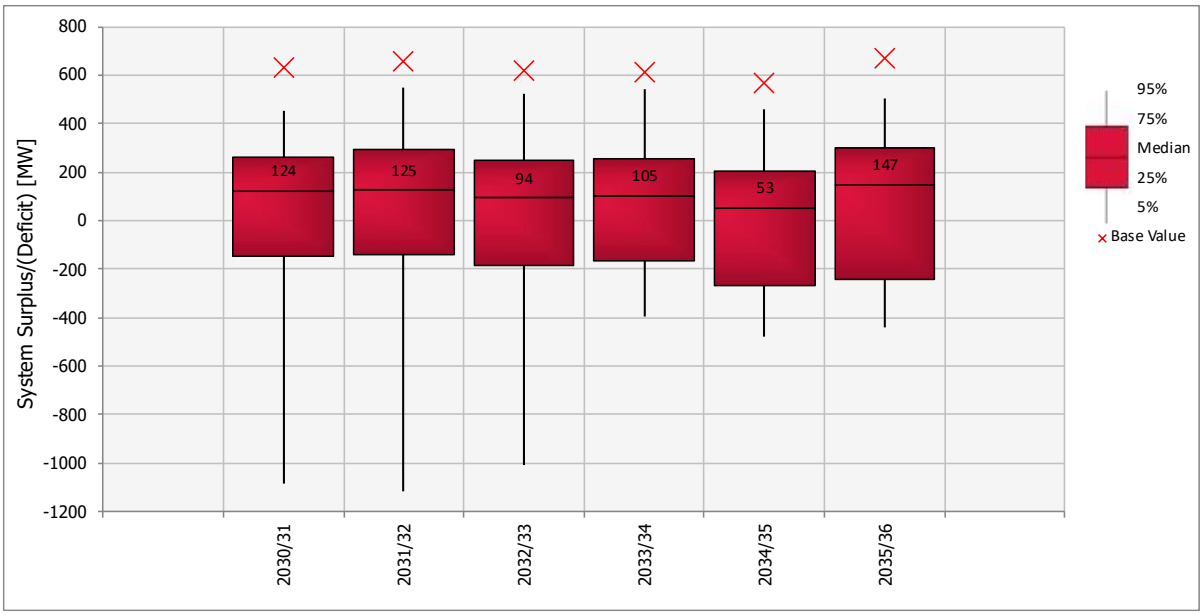

Figure 3: P50 Risk adjusted surplus/deficit for 2030/31 to 2035/36 and box/whisker results