
Review of New Brunswick Power's 2024/25 to 2026/27 DSM Program Initiatives Update

In New Brunswick Power's 2024–2025 General
Rate Application (Matter No. 552)

**Prepared for the New Brunswick Energy and Utilities Board
Staff**

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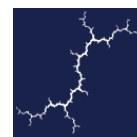
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EXECUTIVE SUMMARY

Purpose

The New Brunswick Energy and Utilities Board Staff (EUB Staff) commissioned Synapse Energy Economics (Synapse) to review, critique, and make recommendations on New Brunswick Power Corporation's (NB Power) 2024/25 to 2026/27 Demand-Side Management (DSM) Program Initiatives Update (DSM Plan). NB Power included the DSM Plan within its 2024–2025 General Rate Application (Matter No. 552). This report provides my summary of the proposed DSM Plan, findings, and recommendations.

Summary of the DSM Plan

NB Power's DSM Plan has many notable features:

- It contains energy efficiency, renewable energy, demand response, and electrification offerings.
- It addresses a variety of market segments and customer types. In particular, NB Power should be commended for its low- and moderate-income (LMI) funding levels, which exceed other jurisdictions and are commensurate with the proportion of the population represented by these customer types.
- It includes a significant portion of funding from sources other than electric ratepayers. This funding is used to support measures with mostly other fuel (non-electric) savings and its inclusion supports the reporting of savings from all fuels which include both electric and other fuel savings reported in gigajoules (GJ).
- It is aligned with and supportive of provincial policies in that it is eliminating incentives for oil heating, features an LMI electrification program focused on customers with oil heat, includes pilots for building energy labeling and energy efficiency financing, and reports carbon emissions reductions from program offerings.

And there are areas for improvement:

- NB Power does not plan to achieve its minimum DSM savings requirements, and its minimum DSM savings requirements (in the form of GWh savings). These requirements are already significantly lower than the achievable potential established in the 2018/19 Potential Study and well below many other Canadian and U.S. jurisdictions (in the form of savings as a percent of sales). The upcoming 2024/25 potential study will provide further detail on the opportunities and costs associated with a potential expansion of offerings. In addition, the Provincial minimum savings targets are too low and only address electricity savings.



- Funding from other sources (which LMI programs rely on completely) is variable and uncertain for the 2025/26 and 2026/27 plan years and seems set to decline substantially in these years. Additionally, NB Power has a considerable waitlist for these LMI programs, which it is trying to address over the next two years.
- There are gaps in its program offerings: the current funding does not support comprehensive DSM for LMI customers as it only addresses electrification and weatherization; there is no electrification program for Residential, Commercial, and Industrial customers; and there are no demand response offerings for Residential customers. NB Power's demand response programs are not well integrated with its energy efficiency offerings and are missing offerings for water heating and electric vehicle (EV) measures, both of which were identified as high priority demand response measures in a recent study.
- The cost of the plan appears to be high relative to other jurisdictions with LMI efforts included, and more in line with these jurisdictions when LMI efforts are removed. NB Power's Energy Total Homes Energy Savings Program is not cost-effective in 2024/25 from a participant perspective. The Energy Efficient Products program does not include upstream and midstream incentives which could bring down costs. NB Power's demand response incentives result in an extremely high benefit for participants. Incentives for demand response doubled from \$25/kW to \$60/kW¹ in 2023/24, and these incentives may be too high. And, Industrial energy efficiency program incentives may also be too high as benefits far outweigh the costs for participants.
- NB Power is providing incentives for existing oil customers to convert to conventional gas and biomass (a renewable energy measure) which may preclude the Province of New Brunswick (the Province) from reaching its carbon reduction goals in future years.
- NB Power's renewable program offerings are unclear and potentially poorly designed. NB Power stated that it is not currently able to provide break-outs of the costs, savings, benefits, and cost-effectiveness for renewable energy versus energy efficiency measures and by each renewable energy resource (NBEUB IR-128u, pages 250 and 251). NB Power plans to provide the same \$120/GJ incentive for wind, solar, and biomass (NBEUB IR-136a on page 261), despite the fact that the costs for each resource are very different.²
- Some benefits are missing from NB Power's Program Administrator Cost Test (PACT) and Participant Cost Test (PCT) including avoided transmission and distribution costs, utility non-energy benefits, and participant non-energy benefits.
- As proposed, the Peak Rebate Program could be better coordinated with the rollout of AMI. It is unclear why DSM Plan spending is allocated to the installation of interval meters when AMI could be installed instead.

¹ All dollar amounts in this report are Canadian dollars unless otherwise specified. I apply an exchange rate of 1.35 CDN to 1.00 USD throughout.

² 2023. *Lazard's Levelized Cost of Energy Analysis—Version 16.0*. Available at: <https://www.lazard.com/research-insights/2023-levelized-cost-of-energyplus/>.



- NB Power has no plans to use end-use disaggregation of its AMI data. AMI data could be used to improve existing program designs by using the analysis of energy consumption and energy-use patterns to help to identify customers who are good candidates for energy efficiency upgrades, thus making current programs more effective. DSM programs can be designed to target services to a cohort of customers that would benefit from similar program delivery and investments.

Lastly, and more generally, the three-year DSM Plan was not well documented and did not appear to be materially different than the DSM Plan Initiative Updates provided in previous years. I spent considerable effort developing interrogatories to fully understand and complete the record regarding the proposed plan. Also, while I agree that cost-effectiveness should be assessed at the program and portfolio levels (as is currently done by NB Power) this does not preclude NB Power from calculating measure-level cost-effectiveness or assembling its proposed DSM Plans based upon measure-level data. More detailed information on the costs (including the incentive and participant costs), savings, benefits, and cost-effectiveness of individual measures (heat pumps for electric and other fuels customers), measure types (renewables vs. energy efficiency), and end uses (i.e. lighting and HVAC), is required to evaluate whether the plan is as effective and cost-efficient as it can be.

Summary Recommendations

I recommend that the Board:

- approve the energy-efficiency-related budgets and savings proposed by NB Power for the 2024/25 and 2025/26 program years.
 - Direct NB Power to provide updates when the Energy Efficient Products and Total Homes Energy Savings programs are redesigned and as more funding from other sources becomes available, as this may occur during these years.
 - Direct NB Power to file (in its next rate case) a revised DSM plan that addresses the deficiencies identified in this report, particularly regarding the level of detail available in the benefit-cost analysis models and plan documentation. DSM plans should identify the measures and associated incentives within each program and provide information on whether the measures are cost-effective from the perspectives of participants and the utility, all of which were missing from the plan filed in the present case. Cost-effectiveness should be reported for all programs, regardless of whether the source of funding is NB Power or some other source.
- Direct NB Power to include energy efficiency, demand response, electrification, and renewable energy measure types in its upcoming 2024/25 potential study and include breakouts of the achievable potential by heating fuel type and customer type (including for LMI customers) in addition to by measure type and end use. Also, the demand response portion of the study should include an assessment of Residential achievable potential, including achievable potential associated with water heaters, EVs, and batteries.



- Approve the electrification budgets and savings proposed in the DSM Plan and work with stakeholders to allocate more funding to energy efficiency and electrification for LMI customers in order to eliminate the wait list for service and provide comprehensive services for these customers.
- reject the renewable energy efforts and conduct a detailed review of the level of proposed renewable investments and the associated incentives. It is not possible to determine if these investments are reasonable and cost-effective without understanding the proposed investments. Renewable energy efforts should be shown separately from energy efficiency measures. This is necessary for understanding how the cost-effectiveness of the renewable energy measures compares to the energy efficiency measures given the current incentive levels.
- approve the demand response program for now, conduct a review of performance and incentives after the 2023/24 program year is complete to determine if changes to the incentive are warranted, and direct NB Power to propose a pilot program for Residential customers. Also, NB Power should clarify how its plans for demand response resources in the near term correspond with its IRP, which does not incorporate demand response until 2030.
- call on NB Power to investigate the benefits and challenges of using AMI data analysis to improve its DSM programs, and require NB Power to better coordinate AMI with the Peak Rebate Program.

I recommend that the Province direct NB Power to pursue all-cost-effective energy efficiency. I also recommend the Province update its minimum electricity savings requirements to be more in line with the established targets in other jurisdictions and the jurisdiction's updated potential, reflect desired performance rather than minimum levels of performance, and include targets for demand response, renewable energy, and electrification efforts in addition to energy efficiency.



1. INTRODUCTION

1.1. Purpose

The New Brunswick Energy and Utilities Board Staff (EUB Staff) commissioned Synapse Energy Economics (Synapse) to review the 2024/25 to 2026/27 DSM Program Initiatives Update (DSM Plan)³ recently filed by the New Brunswick Power Corporation (NB Power or the Corporation). NB Power filed the DSM Plan within Matter No. 552 which is its 2024–2025 General Rate Application. Synapse’s task was to review, critique, and make recommendations on the DSM Plan. EUB Staff submitted 126 interrogatories on behalf of Synapse on the DSM Plan. This report provides my summary of the proposed DSM Plan, including additional context and information gathered through NB Power’s responses to interrogatories, along with my findings and recommendations.

1.2. Qualifications

The authors’ qualifications are summarized below. Additional information regarding Synapse Energy Economics and the authors is available at: www.synapse-energy.com.

Synapse Energy Economics

Synapse Energy Economics is a research and consulting firm specializing in energy, economic, and environmental topics. Since its inception in 1996, Synapse has grown to become a leader in providing rigorous analysis of the electric power sector for public interest and governmental clients.

Synapse’s staff includes over 30 experts in energy and environmental economics, resource planning, electricity dispatch and economic modeling, energy efficiency, renewable energy, energy storage, transportation and building sector electrification, transmission and distribution, rate design and cost allocation, risk management, benefit-cost analysis, environmental compliance, climate science, and both regulated and competitive electricity and natural gas markets. Several of our senior-level staff members have more than 30 years of experience in the economics, regulation, and deregulation of the electricity and natural gas sectors. They have held positions as regulators, economists, and utility commission staff.

Services provided by Synapse include economic and technical analyses, regulatory support, research and report writing, policy analysis and development, representation in stakeholder committees, facilitation, trainings, development of analytical tools, and expert witness services. Synapse is committed to the idea that robust, transparent analyses can help to inform better policy and planning decisions. Many of our

³ In its response to NBEUB IR-105a, NB Power clarified that though this filing is named an Initiatives Update it is a Three-Year Plan.



clients seek out our experience and expertise to help them participate effectively in planning, regulatory, and litigated cases, and other forums for public involvement and decision-making.

Synapse’s clients include public utility commissions throughout the United States and Canada, offices of consumer advocates, attorneys general, environmental organizations, foundations, governmental associations, public interest groups, and federal clients such as the U.S. Environmental Protection Agency and the Department of Justice. Our work for international clients has included projects for the United Nations Framework Convention on Climate Change, the World Bank Group, the Global Environment Facility, and the International Joint Commission, among others.

Jennifer Kallay

Jenn Kallay has 17 years of professional experience analyzing the benefits and costs of demand-side management (DSM) resources for jurisdictions in the United States and Canada. Her work entails reviewing different regulatory approaches; assessing the ability of utility plans to tap into cost-effective potential; researching best practice program designs and policies; analyzing DSM resources as an alternative to new power plants; understanding and accounting for the full benefits of DSM resources; and conducting cost-effectiveness and rate and bill impact analyses. Ms. Kallay is currently working on DSM program efforts in Alberta and Nova Scotia. Additionally, Ms. Kallay has direct experience with municipal utilities and their governance as an elected member of the Board of Commissioners of Wakefield’s Municipal Gas & Light Department in Massachusetts.

2. REGULATORY AND POLICY CONTEXT

Energy Efficiency Regulations

In 2022, the Province prescribed the following minimum dollar transfers to the Energy Efficiency Fund for funding the development and delivery of energy efficiency and energy conservation for low-income customers, First Nations, and non-profit organizations. At the same time, it established minimum savings levels:

- 2024/25: \$15 million and a reduction of 0.55 percent of the forecasted in-province electricity sales (in kWh);
- 2025/26: \$20 million and a reduction of 0.60 percent; and
- 2026/27: \$25 million and a reduction of 0.65 percent.⁴

⁴ Energy Efficiency Regulation – Electricity Act. Section 117.22.



Also, current regulations preclude NB Power from using ratepayer funding to provide incentives for measures with mostly non-electric savings.⁵

Climate Change Policies and Regulations

New Brunswick's 2022–2027 Climate Change Action Plan⁶ includes commitments to reduce greenhouse gas emissions to at least 46 percent below 2005 emission levels by 2030 and to achieve net-zero emissions by 2050. The plan sets forth two actions for the utility related to electrification:

- Action 4: Work to have 6 percent of new light-duty vehicles (e.g. passenger cars, sport utility vehicles, pickup trucks) sales be electric vehicles (EV) by 2025 and 50 percent by 2030, using incentives and programs to promote EVs and support charging infrastructure in New Brunswick.
- Action 10: Work with the federal government toward the phase-out of heating oil use in all buildings (commercial, government, and residential). This work will include identifying transition support for heating oil delivery companies. If adequate support can be found to minimize impacts to customers and suppliers, phase out heating oil by 2030.

NB Power also supports the following actions:

- Action 5a – Fuel Savings Measures for Trucking
- Action 5b – Freight Transportation Study
- Action 8b – Energy Efficiency Financing
- Action 12 - Energy Performance Labeling and Disclosure Pilot

New Brunswick has a carbon tax and some of the proceeds are allocated to the Climate Fund which funds the low- and moderate-income (LMI) energy efficiency and electrification programs in NB Power's DSM Plan. NB Power must apply annually to the NB Climate Fund to support these efforts (NBEUB IR-122a on pages 230 and 231).

The federal government's 2030 Emissions Reduction Plan includes a plan to create a building code adoption acceleration fund, increased support for energy management systems in small and medium enterprises, and revised timelines for a light-duty zero-emission vehicle mandate.⁷

⁵ Energy Efficiency Regulation – Electricity Act. Section 117.1 and Energy Efficiency Regulation – Electricity Act. Variance Account Regulation. Part 4 Energy Efficiency and Demand Response Deferral Account.

⁶ New Brunswick's Climate Change Action Plan 2022–2027. Available at: <https://www2.gnb.ca/content/dam/gnb/Corporate/Promo/climate/climate-change-action-plan.pdf>.

⁷ Canada's 2030 Emissions Reduction Plan. Available at: <https://www.canada.ca/en/services/environment/weather/climatechange/climate-plan/climate-plan-overview/emissions-reduction-2030/plan.html>.

3. REQUESTED APPROVALS

DSM costs are included in the revenue requirement that provides the basis for NB Power's proposed rate increase (NBEUB IR-116d on page 209). NB Power is requesting approval of its DSM Plan costs that do not qualify for the regulatory deferral. These costs total \$7.9 million in 2024/25 and \$9.3 million in 2025/26 (NBEUB IR-116c on page 209).

4. SUMMARY OF THE DSM PLAN

4.1. Customers, Sales, Revenues, and Housing Stock Characteristics

As of 2022/23 NB Power had 379,420 direct customers, 13,543 GWh in sales, and \$1,572 million in in-province revenues (NBEUB IR-123d, page 235). Residential customers and indirect wholesale customers accounted for 53 percent of sales, General Service customers for 21 percent, and Industrial customers for 26 percent.⁸ The Residential building stock is 84 percent single-family, 7 percent multi-family, 5 percent mobile homes, and 4 percent other.⁹ 75 percent of homes are primarily heated by electricity, 11 percent by wood and wood pellets, 7 percent by propane, 5 percent by oil, and 2 percent by natural gas.¹⁰ According to NB Power, heating fuel types for LMI customers and commercial and industrial customers are unknown (NBEUB IR-158c and d, page 287).

Regarding its LMI efforts, NB Power reported approximately 168,800 LMI customers¹¹ and 379,420 total customers¹² in 2022/23 (NBEUB IR-123d on page 235 and NBEUB IR-163e on page 294). Based upon this information, Synapse estimates that 44 percent of NB Power's customers are LMI.¹³

⁸ NB Power Annual Report 2022/23. Available at: <https://www.nbpower.com/media/1492469/nb-power-annual-report-2022-23.pdf>.

⁹ NPB 2.68, Part A - Appendix AO 2024-25 to 2026-27 Total Home Energy Savings Program Implementation Plan, page 8, Table 8: NB Power Residential Building Stock.

¹⁰ NPB 2.68, Part A - Appendix AO 2024-25 to 2026-27 Total Home Energy Savings Program Implementation Plan, page 8, Table 9: NB Building Stock Primary Heating Fuel.

¹¹ Includes indirect customers which are customers of municipal utilities.

¹² These are direct customers only, not including customers of municipal utilities.

¹³ Synapse acknowledges that this percentage is likely a bit lower given that the NB Power's total customer count does not include indirect customers.

4.2. Targets

Table 1 below shows NB Power’s electricity savings targets compared to select leading Canadian jurisdictions. NB Power’s savings targets are lower than other leading jurisdictions in Canada.

Table 1. NB Power’s electricity savings targets compared to select Canadian jurisdictions

Province/ Territory	Program Administrator	2023	2024	2025	2026	2027	Avg
NS	Efficiency Nova Scotia	0.98%	1.17%	1.23%	-	-	1.13%
ON	IESO	0.91%	1.20%	-	-	-	1.05%
PE	EfficiencyPEI	0.83%	0.71%	0.73%	-	-	0.76%
NB	NB Power	0.50%	0.55%	0.60%	0.65%	0.70%	0.60%
BC	BC Hydro/Fortis BC	0.57%	0.61%	-	-	-	0.59%
QC	Hydro-Quebec	0.41%	0.46%	0.45%	0.44%	0.44%	0.44%

Note: NB’s targets are updated to reflect the current targets in Energy Efficiency Regulation – Electricity Act, Section 117.24.

Source: The 2023 Energy Efficiency Programs Update: Provinces and Territories, Table 7. Electricity programs savings targets, page 26, available at: <https://www.energycanada.org/programs-report>.

4.3. Spending and Funding Sources

NB Power’s energy efficiency and electrification efforts benefit from the use of federal and provincial funding. NB Power is responsible for the implementation, marketing and outreach, technical and customer service, evaluation, and performance of these efforts regardless of the source of funding (NBEUB IR-106b-d, page 190). Also, all electricity savings count towards the minimum savings target regardless of funding source (NBEUB IR-114b, page 205). As a result, I consider the costs, savings, and benefits associated with all funding sources relevant to this assessment, and all figures contain the proposed total savings and benefits from all funding sources unless otherwise noted.¹⁴

NB Power proposes \$236.0 million in total DSM-related spending (including funding from other sources) over the three-year period. Table 2 below shows the proposed total DSM Plan spending.

- Total spending declines significantly from \$88.9 million in 2024/25 to \$69.9 million in 2025/26. While spending rebounds slightly to \$77.2 million in 2026/27, proposed spending in this year still falls short of the spending levels proposed for 2024/25.
- NB Power proposes to allocate 74 percent of the total three-year proposed spending for energy efficiency and renewable energy measures, 7 percent for demand response, 14 percent for electrification for LMI customers with oil heated homes (LMI Electrification), and 5 percent for overhead and enablement.
- NB Power’s proposed percent of total spending for energy efficiency, renewable energy, and demand response efforts is relatively consistent over time and generally increases

¹⁴ NB Power’s responses to my interrogatories often excluded costs and benefits associated with other funding sources. I added those back in if it was possible to do so.

from the first year to the third year of the DSM Plan. NB Power’s proposed percent of total spending for LMI Electrification is not consistent over the three years: it has a significant drop in the percent spending in Years 2 and 3, relative to Year 1.

Table 2. Proposed total DSM Plan spending (including NB Power and other funding sources)

	Energy Efficiency / Renewable Energy		Demand Response		LMI Electrification		Overhead & Enablement		Total	
	\$ millions	% of Total	\$ millions	% of Total	\$ millions	% of Total	\$ millions	% of Total	\$ millions	% of Total
2024/25	\$56.5	64%	\$4.8	5%	\$23.9	27%	\$3.7	4%	\$88.9	100%
2025/26	\$55.9	80%	\$5.6	8%	\$3.3	5%	\$5.1	7%	\$69.9	100%
2026/27	\$63.3	82%	\$5.3	7%	\$4.8	6%	\$3.8	5%	\$77.2	100%
2024/25 to 2026/27 Total	\$175.7	74%	\$15.7	7%	\$32.0	14%	\$12.6	5%	\$236.0	100%

Notes: The tables are misnumbered in the NBP02.61 2024_25 to 2026_27 DSM Initiatives Update. The table numbering in the sources is corrected to proceed sequentially.

Sources:

- NBP02.61 2024_25 to 2026_27 DSM Initiatives Update Table 2: 2024/25 Planned EE-DR Program Spending by Funding Source, \$ Millions page 9.
- NBP02.61 2024_25 to 2026_27 DSM Initiatives Update Table 9: 2025/26 Planned EE-DR Program Spending by Funding Source, \$ Millions page 12.
- NBP02.61 2024_25 to 2026_27 DSM Initiatives Update Table 16: 2026/27 Planned EE-DR Program Spending by Funding Source, \$ Millions page 14.
- NBP02.61 2024_25 to 2026_27 DSM Initiatives Update Table 23: 2024/25 Planned Electrification Program Spending by Funding Source, \$ Millions page 18.
- NBP02.61 2024_25 to 2026_27 DSM Initiatives Update Table 26: 2025/26 Planned Electrification Program Spending by Funding Source, \$ Millions page 19.
- NBP02.61 2024_25 to 2026_27 DSM Initiatives Update Table 29: 2026/27 Planned Electrification Program Spending by Funding Source, \$ Millions page 20.

NB Power administers energy efficiency and electrification programs using a combination of ratepayer funding and outside funding.¹⁵ The energy efficiency programs include renewable energy measures such as solar, wind, and biomass (NBEUB IR-136a, page 261). NB Power proposes \$111.1 million in ratepayer funding to support energy efficiency / renewable energy efforts and \$15.7 million to support demand response efforts over the three-year period. Figure 1 below shows the proposed total DSM Plan spending for NB Power and other funding sources.

- Provincial and federal funding sources contribute \$64.5 million to energy efficiency / renewable energy efforts, or 37 percent on average across the three years. There is no

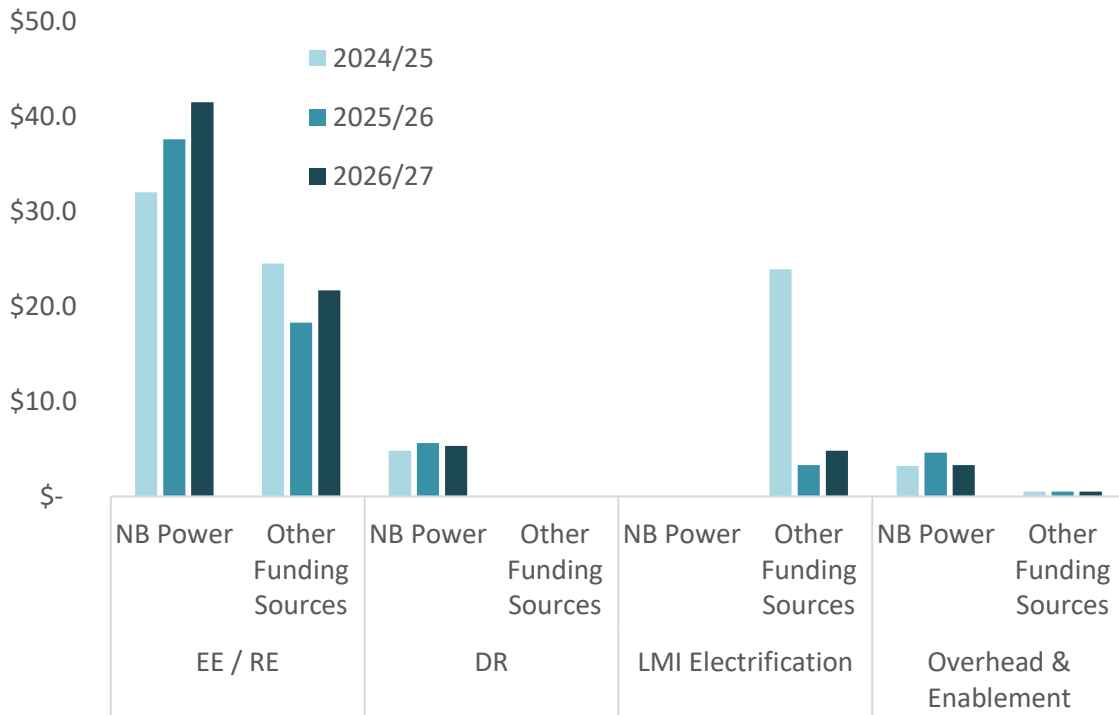
¹⁵ Other funding sources do not support demand response efforts.

funding anticipated for the Future Electricity Fund in 2025/26 and 2026/27 as the funding will be spent as of 2024/25. There is no funding included from the NB Climate Fund in 2025/26 and 2026/27 as NB Power will apply for this funding in Q4 of 2024 and 2025, respectively (NBEUB IR-119, page 227).

- LMI electrification efforts are entirely supported by \$32.0 million in provincial and federal funding. Funding is not available from the Future Electricity Fund or the Low Carbon Economy Fund in 2025/26 and 2026/27 as funds will be depleted by then. Funding from the NB Climate Fund 2025/26 and 2026/27 is unknown as funding commitments have yet to be made. The Energy Efficiency Fund grows in 2025/26 and 2026/27 and makes more funding available for this program (NBEUB IR 165a page 297, NBEUB IR-166a page 299).
- Overhead and enablement efforts include funding from other sources for market transformation activities such as a financing pilot (supporting Action 8b of the Climate Change Action Plan) and a building labeling pilot (supporting Action 12 of the Climate Change Action Plan) (NBEUB IR-122a, page 230 and 231).



Figure 1. Proposed total DSM Plan spending for NB Power and other funding sources



Notes:

- The tables are misnumbered in the NBPO2.61 2024_25 to 2026_27 DSM Initiatives Update. The table numbering in the sources is corrected to proceed sequentially.

Sources:

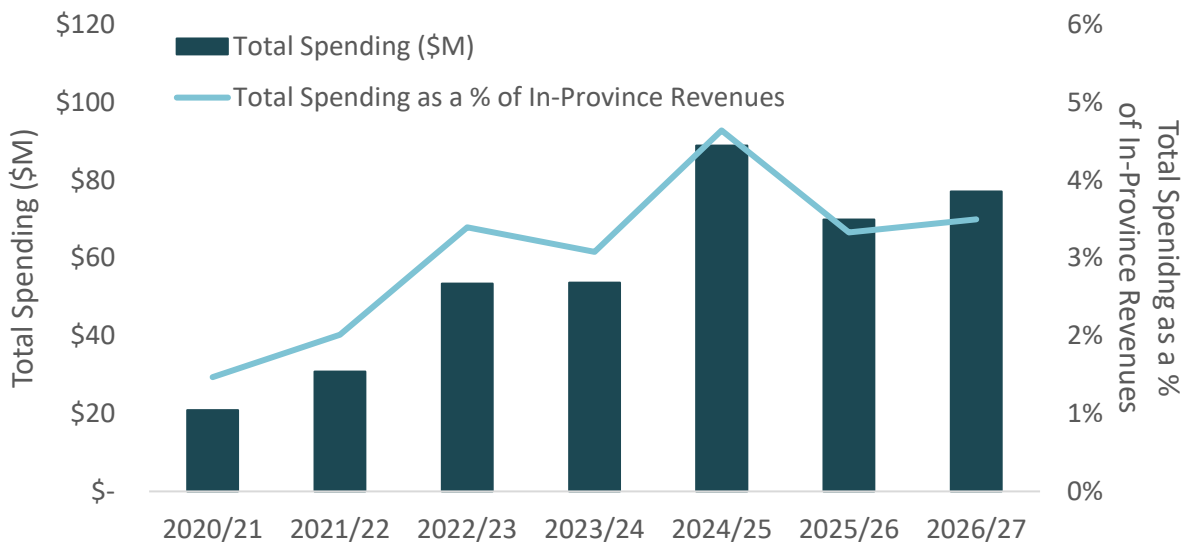
- NBPO2.61 2024_25 to 2026_27 DSM Initiatives Update Table 2: 2024/25 Planned EE-DR Program Spending by Funding Source, \$ Millions page 9.
- NBPO2.61 2024_25 to 2026_27 DSM Initiatives Update Table 9: 2025/26 Planned EE-DR Program Spending by Funding Source, \$ Millions page 12.
- NBPO2.61 2024_25 to 2026_27 DSM Initiatives Update Table 16: 2026/27 Planned EE-DR Program Spending by Funding Source, \$ Millions page 14.
- NBPO2.61 2024_25 to 2026_27 DSM Initiatives Update Table 23: 2024/25 Planned Electrification Program Spending by Funding Source, \$ Millions page 18.
- NBPO2.61 2024_25 to 2026_27 DSM Initiatives Update Table 26: 2025/26 Planned Electrification Program Spending by Funding Source, \$ Millions page 19.
- NBPO2.61 2024_25 to 2026_27 DSM Initiatives Update Table 29: 2026/27 Planned Electrification Program Spending by Funding Source, \$ Millions page 20.

Figure 2 shows total spending and spending as a percent of revenues from 2020/21 through the 2024/25 to 2026/27 DSM Plan. The total spending on DSM more than quadrupled from \$21 million in 2020/21 to \$89 million in 2024/25, the highest proposed year of spending. In-province revenues have also increased substantially over this time period, with total spending as a percent of in-province revenues jumping from 1.5 percent in 2020/21 to 4.6 percent in 2024/25. Much of the increase in total spending is



proposed in the first year of the 2024/25 to 2026/27 DSM Plan, with a 65 percent increase proposed for 2024/25 as compared to total spending of \$53 million in 2022/23 and 2023/24.¹⁶

Figure 2. Historical and proposed total spending and spending % of revenues



Sources:

- Revenues for 2020/21, 2021/22, 2022/23 from NBEUB IR-123d, page 235.
- Revenues for 2024/25, 2025/26, 2026/27 from NBEUB IR-116b, page 209.
- Synapse estimated 2023/24 in-province revenues as the midpoint between 2022/23 and 2024/25 in-province revenues.
- 2020/21, 2021/22, and 2023/24 DSM Funding by NB Power and Other Sources from 2023/24 DSM Initiatives Update provided as NBEUB IR-123b Attachment.
- 2022/23 DSM Funding by NB Power and Other Sources from NBPO2.61 Part A - Appendix AHi 2024-25 to 2026-27 DSM Program Initiatives Update, Appendix A. 2022/23 Program Achievements.
- 2024/25 to 2026/27 DSM Funding by NB Power and Other Sources from Matter 552, NB Power 2024-2025 General Rate Application, Appendix AJ - 2024-25 to 2026-27 DSM Initiatives Update.

Table 3 below provides a comparison of NB Power’s DSM spending to leading, cold-climate jurisdictions in the United States and Canada. I examine DSM spending more generally (as a percent of revenues and per capita) and on low-income customers in particular (as a percent of total DSM spending). NB data is from the proposed 2024/25 DSM Plan. Data for all other jurisdictions is from 2021. I converted spending per capita for Canadian provinces to 2024 Canadian dollars.

- NB Power proposes the third-highest spending per capita on DSM among Canadian provinces.

¹⁶ Proposed total spending is lower in 2025/26 and 2026/27 relative to 2024/25, reaching 3 percent of in-province revenues in those two years.

- NB Power's proposed spending as a percent of revenues on DSM is just below the midpoint of the range of spending by the subset of U.S. utilities examined.
- NB Power proposes the highest low-income DSM spending as a percent of total DSM spending as compared to all Canadian provinces, and its proposed spending is much higher than the subset of U.S utilities examined. This is likely because NB Power's low-income spending also includes spending on moderate-income customers.



Table 3. Comparison of key spending-related performance metrics across select Canadian and U.S. jurisdictions

	Jurisdiction	Spending per Capita	Spending % of Revenue	Low-Income Spending % of Total Spending
Canada	PE	\$97.43	NA	41.8%
	NS	\$78.36	NA	23.5%
	NB	\$72.19	4.0%	46.1%
	BC	\$58.38	NA	5.6%
	QC	\$46.23	NA	0.4%
	ON	\$25.48	NA	17.3%
United States	MA – National Grid	NA	12.0%	10.1%
	MA – Eversource	NA	11.7%	9.9%
	IL – Com Ed	NA	6.5%	9.7%
	IL – Ameren	NA	6.0%	19.4%
	MI – Consumers	NA	3.5%	9.0%
	OR – PGE	NA	3.5%	0.4%
	MN - Xcel	NA	3.3%	2.0%
	MI - DTE	NA	3.2%	13.4%
	CO - Xcel	NA	2.5%	5.6%
	NY – National Grid	NA	2.2%	0.0%
	NY - LIPA	NA	1.9%	3.2%
	NY – Con Ed	NA	1.2%	3.6%

Notes:

- The U.S. and Canadian Energy Efficiency Scorecards provide different metrics for assessing program performance. An “NA” indicates data that is not available from the scorecard.
- The Canadian scorecard includes natural gas energy efficiency program spending.
- NB low-income spending includes spending on moderate-income customers in addition to low-income customers.

Sources:

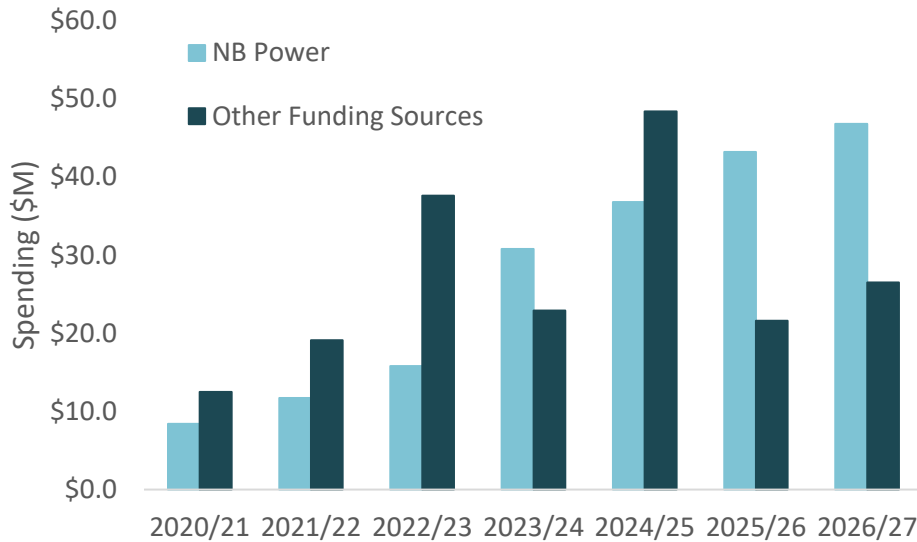
- U.S.: Specian, M., W. Berg, S. Subramanian, and K. Campbell. 2023. 2023 Utility Energy Efficiency Scorecard. Washington, DC: ACEEE. [aceee.org/research-report/U2304](https://www.aceee.org/research-report/U2304).
- Canada (not NB): Gaede, J., Nippard, A., Haley, B., Linders, A. 2022. The 2022 Canadian Energy Efficiency Scorecard: Provinces and Territories. Efficiency Canada, Carleton University, Ottawa, ON.
- NB Spending % of Revenue: Estimated using 2022/23 revenues from NBEUB IR-123d, page 235 and spending data from 2024/25.
- NB Spending per Capita: Estimated using average 2020 quarterly population data from: <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1710000901> and spending data from 2024/25.
- NB Low-Income Spending % of Total Spending: Estimated using 2024/25 Low-Income program spending data from NBEUB IR-118c on page 226 and spending data from 2024/25.

Figure 3 shows the breakout of total spending by funding from NB Power and funding from other sources from 2020/21 through the 2024/25 to 2026/27 DSM Plan.

- Funding from other sources is variable over time, hovering around \$20 to \$25 million in most years and peaking at \$48 million in 2024/25.

- Funding from NB Power has steadily increased over the years and is proposed to continue to increase by 17 and 8 percent in 2025/26 and 2026/27 respectively, relative to the prior year.

Figure 3. Historical and proposed DSM Plan funding from NB Power and other sources



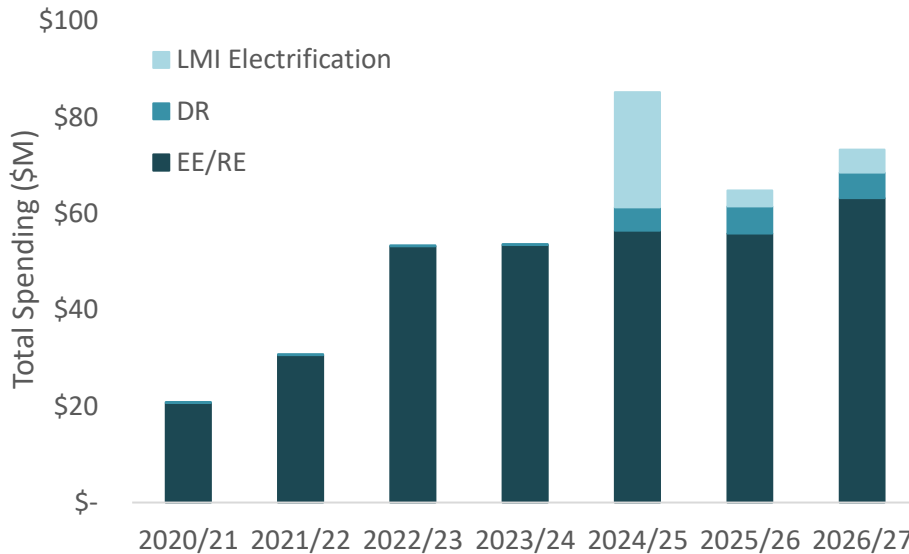
Sources:

- 2020/21, 2021/22, and 2023/24 DSM Funding by NB Power and Other Sources from 2023/24 DSM Initiatives Update provided as NBEUB IR-123b Attachment.
- 2022/23 DSM Funding by NB Power and Other Sources from NBP02.61 Part A - Appendix AHi 2024-25 to 2026-27 DSM Program Initiatives Update, Appendix A. 2022/23 Program Achievements.
- 2024/25 to 2026/27 DSM Funding by NB Power and Other Sources from Matter 552, NB Power 2024-2025 General Rate Application, Appendix AJ - 2024-25 to 2026-27 DSM Initiatives Update.

Figure 4 shows the breakout of total spending by program type from 2020/21 through the 2024/25 to 2026/27 DSM Plan.

- Energy efficiency / renewable energy spending is relatively stable from 2022/23 to 2025/26, with a proposed uptick in 2026/27.
- Demand response spending is present at almost undiscernible levels from 2020/21 to 2023/24, with a significant uptick proposed for 2024/25 through 2026/27.
- LMI electrification spending is significant in 2024/25 and then declines substantially in 2025/26 and 2026/27.

Figure 4. Historical and proposed breakout of total spending by program type



Notes: LMI electrification efforts were not broken out separately from other LMI energy efficiency efforts prior to 2024/25, if any existed.

Sources:

- 2020/21, 2021/22, and 2023/24 DSM Funding by NB Power and Other Sources from 2023/24 DSM Initiatives Update provided as NBEUB IR-123b Attachment.
- 2022/23 DSM Funding by NB Power and Other Sources from NBP02.61 Part A - Appendix AHi 2024-25 to 2026-27 DSM Program Initiatives Update, Appendix A. 2022/23 Program Achievements.
- 2024/25 to 2026/27 DSM Funding by NB Power and Other Sources from Matter 552, NB Power 2024-2025 General Rate Application, Appendix AJ - 2024-25 to 2026-27 DSM Initiatives Update.

4.4. Program Types, Sectors, and Market Segments Supported

Table 4 below provides a description of program coverage in NB Power’s proposed DSM Plan.

- NB Power’s portfolio includes a wide range of measures and efforts, from more traditional energy efficiency efforts focusing on new construction, existing buildings, and energy efficient products to newer efforts focusing on electrification, demand response, and renewables.
- The programs also cover a wide range of potential participants in the residential, commercial, and industrial sectors. The portfolio includes offerings for hard-to-reach customers, including LMI, small commercial, and small industrial customers.
- While there is no single program that focuses exclusively on multi-family buildings, multi-family buildings are addressed through the Commercial Building Retrofit Program.

Table 4. NB Power’s proposed DSM Plan programs by program type and sector

Program Type	Sector	Program Name
Energy Efficiency	Residential	New Home Energy Savings Program
		Total Home Energy Savings Program
		Energy Efficient Products Program
	LMI	Enhanced Energy Savings Program - electric
	Commercial & Industrial	Commercial New Construction
		Business Rebate Program
		Commercial Buildings Retrofit Program
Industrial EE Program		
Electrification	Residential	NA
	LMI	Enhanced Energy Savings Program – oil transition
	Commercial & Industrial	NA
Demand Response	Residential	NA
	LMI	NA
	Commercial & Industrial	Peak Rebate Program
Renewables	Residential	New Home Energy Savings Program
		Total Home Energy Savings Program
	LMI	Enhanced Energy Savings Program – oil transition
	Commercial & Industrial	Business Rebate Program
		Commercial Buildings Retrofit Program
		Industrial EE Program

Sources:

- Energy efficiency from NBP 2.61, Part A – Appendix AHi 2024-25 to 2026-27 DSM Program Initiatives Update.
- Electrification from NBEUB IR-237c and d, page 80.
- Demand response from NBEUB IR-141e, page 268.
- Renewables from NBEUB IR-267, page 126.

While NB Power’s program provides broad coverage of market segments and customer types, there are some noteworthy gaps and missing information regarding its program offerings. For example:

- NB Power does not know the proposed proportion of savings associated with lighting or any other end use as it does not plan at the measure level (NBEUB IR-258, page 114).
- The in-store rebates in the proposed Energy Efficiency Products program are not finalized at this time and spending was set at the value of previous in-store rebate campaigns with the lighting measures removed (NBEUB IR-247a, page 96). Also, there are no upstream and/or midstream incentives in the Energy Efficient Products program. Upstream incentives are directed to manufacturers, midstream incentives are directed to a wholesale distributor and/or the plumber or HVAC contractor for the customer, and downstream incentives are for the customers¹⁷ (NBEUB IR-128x on page 251). NB

¹⁷ EnergyStar.gov. *How It Works: Understand the Fundamentals of Shifting Incentives to a Distributor*. Available at: https://www.energystar.gov/partner_resources/products_partner_resources/retailer-resources/midstream-programs/how-it-works.



Power will be exploring potential midstream programs, and there is no current timeline for any additions (NBEUB IR-268b, page 128).

- There is no electrification program for non-LMI customers, including Residential, Commercial, and Industrial customers (NBEUB IR-237c and d, page 239).
- The LMI electrification program is limited to homes with oil heating. And, the measures offered in the LMI retrofit program are limited to heating system replacements and weatherization and electrification efforts (NBEUB IR-237e, page 80). Also, as of February 1, 2024, NB Power has a waitlist of 12,335 applicants to the Enhanced Energy Savings Program (Streams 1 & 2). NB Power committed to working with the province to secure sufficient funding to clear the waitlist over the next two years¹⁸ (NBEUB IR-123 on page 236).
- Regarding demand response, NB Power does not serve Residential customers and does not currently have any program offerings for specifically integrating water heaters, EVs, or batteries into a demand response program.¹⁹ Additionally, NB Power is not advising its customers on the adoption of technologies with demand response capabilities (NBEUB IR-143a and c, page 270). In response to NBEUB IR-176a page 315, NB Power committed to move up to 2024/25 the launch of a communication strategy to educate customers about their energy use as it relates to peak demand and efforts. Lastly, in its IRP, NB Power does not incorporate any demand response until 2030.²⁰ This does not align with NB Power's DSM plan which proposes considerable spending on and savings from demand response in the immediate term.

Also, NB Power is supporting conversions of existing oil customers to natural gas (NBEUB IR-128o, page 250).

4.5. Energy and Carbon Emissions Savings

NB Power's DSM Plan saves electricity, other fuels, peak demand, and equivalent carbon emissions. Table 5 below summarizes the savings included in NB Power's three-year DSM Plan.

- Annual and lifetime electricity savings and peak demand reductions increase steadily over the three-year period.
- Annual and lifetime other fuel savings and carbon emissions reductions dip in 2025/26 and exceed 2024/25 levels in 2026/27.

¹⁸ According to NBEUB IR-269d, page 131 the Province requested estimates from NB Power regarding the costs to clear the existing waitlist by the end of 2025/26.

¹⁹ NB Power reports 4,262 registered EVs in the province as of Q3 2023/24. NB Power does not track the number of batteries installed in its service territory (NBEUB IR-263a-c, page 121).

²⁰ NB Power. *2023 Integrated Resource Plan*. Appendix D – Expansion Plan Tables, pages 91 to 98, available at: https://www.nbpower.com/media/1492536/2023_irp.pdf

Table 5. Energy and carbon emissions savings in NB Power’s proposed DSM Plan

	Annual Electricity Savings (GWh)	Lifetime Electricity Savings (GWh)	Annual Other Fuel Savings (GJ)	Lifetime Other Fuel Savings (GJ)	Peak Demand Reductions (MW)	Annual Carbon Emissions Reductions (tonnes CO2e)	Lifetime Carbon Emissions Reductions (tonnes CO2e)
2024/25	73	940	464,464	6,670,600	81	33,642	479,500
2025/26	87	1,195	434,955	6,097,900	95	32,024	442,900
2026/27	95	1,350	469,963	6,813,046	97	34,577	494,100
2024/25 to 2026/27 Total	254	3,485	1,369,402	19,581,546	272	100,243	1,416,500

Notes:

- The tables are misnumbered in the NBPO2.61 2024_25 to 2026_27 DSM Initiatives Update. The table numbering in the sources is corrected to proceed sequentially.

Sources:

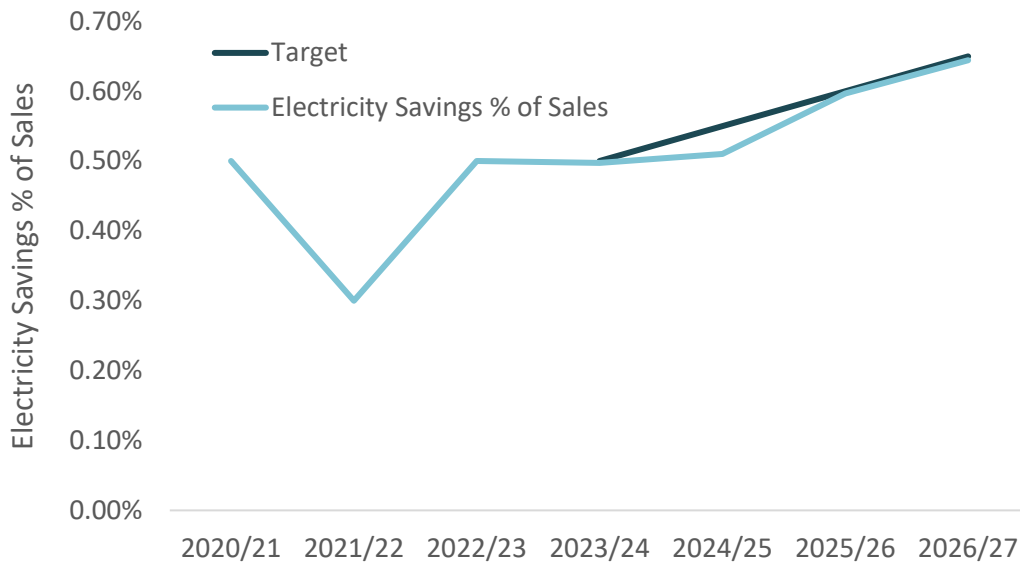
- NBPO2.61 2024_25 to 2026_27 DSM Initiatives Update Table 3: 2024/25 EE-DR Portfolio Targets page 9.
- NBPO2.61 2024_25 to 2026_27 DSM Initiatives Update Table 10: 2025/26 EE-DR Portfolio Targets page 12.
- NBPO2.61 2024_25 to 2026_27 DSM Initiatives Update Table 17: 2026/27 EE-DR Portfolio Targets page 15.
- NBPO2.61 2024_25 to 2026_27 DSM Initiatives Update Table 24: 2024/25 Electrification Program Targets page 18.
- NBPO2.61 2024_25 to 2026_27 DSM Initiatives Update Table 27: 2025/26 Electrification Program Targets page 19.
- NBPO2.61 2024_25 to 2026_27 DSM Initiatives Update Table 30: 2026/27 Electrification Program Targets page 20.
- Lifetime savings from NBEUB IR-117d and e, page 214

Figure 5 below provides a comparison of NB Power’s historical and proposed DSM annual electricity savings as a percent of sales to targets.

- NB Power is not proposing to meet its targets in any year. The most significant difference between the target and proposed performance is in 2024/25 when proposed performance is 7 percent below the target. The proposed performance is slightly below the target for the other plan years (<1 percent).
- 2024/25 proposed savings as a percent of sales is not substantively different from past years. NB Power reached similar levels (0.50 percent) in 2020/21 and 2022/23 and is proposing to reach this level in 2023/24.



Figure 5. Historical and proposed DSM annual electricity savings % of sales vs. targets



Sources:

- NB’s targets are from Energy Efficiency Regulation – Electricity Act. Section 117.24.
- 2020/21, 2021/22, and 2023/24 DSM Savings from 2023/24 DSM Initiatives Update provided as NBEUB IR-123b Attachment.
- 2022/23 DSM Savings from NBP02.61 Part A - Appendix AHi 2024-25 to 2026-27 DSM Program Initiatives Update, Appendix A. 2022/23 Program Achievements.
- 2024/25 to 2026/27 DSM Savings and Sales from Matter 552, NB Power 2024-2025 General Rate Application, Appendix AJ - 2024-25 to 2026-27 DSM Initiatives Update.
- 2020/21 to 2022/23 sales are from NBEUB IR-123d, page 235.
- 2023/24 sales from 2023/24 DSM Initiatives Update provided as NBEUB IR-123b Attachment.

Table 6 below provides a comparison of NB Power’s proposed 2024/25 DSM savings to leading, cold-climate jurisdictions in the United States and Canada. We examine energy efficiency net annual and lifetime electricity savings (as a percent of sales) and demand response peak load reductions (as a percent of peak demand). NB Power data is from the proposed 2024/25 DSM Plan. Data for all other jurisdictions is from 2021.

- NB Power’s annual electricity savings percent of sales is on the lower end of the range of values from these Canadian jurisdictions, at a level that is half of the leading jurisdictions. It is also significantly lower than all of the values from these U.S. utilities.
- NB Power’s lifetime electricity savings percent of sales is significantly lower than these U.S. utilities.
- NB Power’s peak savings as a percent of peak demand is on the lower end of the range for these Canadian jurisdictions with programmatic efforts in place.

Table 6. Comparison of key savings-related performance metrics across select Canadian and U.S. jurisdictions

Jurisdiction		Energy Efficiency: Net Annual Electricity Savings % of Sales	Energy Efficiency: Net Lifetime Electricity Savings % of Sales	Demand Response: Peak Savings % of Peak Demand
Canada	NS	0.99%	NA	0.00%
	PE	0.87%	NA	0.00%
	ON	0.75%	NA	7.52%
	NB	0.51%	6.60%	2.00%
	BC	0.49%	NA	0.13%
	QC	0.46%	NA	4.57%
U.S.	MA – National Grid	2.29%	20.54%	NA
	IL – Com Ed	2.17%	25.46%	NA
	MN - Xcel	2.16%	31.11%	NA
	MA – Eversource	2.09%	22.37%	NA
	MI - DTE	2.06%	20.68%	NA
	MI - Consumers	1.86%	22.38%	NA
	CO - Xcel	1.58%	24.41%	NA
	NY - LIPA	1.49%	11.41%	NA
	NY – National Grid	1.36%	16.03%	NA
	IL - Ameren	1.30%	17.22%	NA
	NY – Con Ed	1.27%	12.06%	NA
OR – PGE	0.84%	12.32%	NA	

Notes:

- The U.S. and Canadian Energy Efficiency Scorecards provide different metrics for assessing program performance. An “NA” indicates data that is not available from the scorecard.
- Where provided, Peak Savings % of Peak Demand includes savings from demand response efforts only. Data for U.S. jurisdictions is related to energy efficiency efforts and not demand response efforts, and therefore was not included.

Sources:

- U.S.: Specian, M., W. Berg, S. Subramanian, and K. Campbell. 2023. 2023 Utility Energy Efficiency Scorecard. Washington, DC: ACEEE. [aceee.org/research-report/U2304](https://www.aceee.org/research-report/U2304).
- Canada (not NB): Gaede, J., Nippard, A., Haley, B., Linders, A. 2022. The 2022 Canadian Energy Efficiency Scorecard: Provinces and Territories. Efficiency Canada, Carleton University, Ottawa, ON.
- NB Power annual savings and sales from 2024/25 to 2026/27 DSM Savings and Sales from Matter 552, NB Power 2024-2025 General Rate Application, Appendix AJ - 2024-25 to 2026-27 DSM Initiatives Update.
- NB Power lifetime savings from NBEUB IR-117d and e, page 214.
- NB Power reached its highest recorded instantaneous peak demand of 3,442 MW on February 4, 2023, per its 2022/23 Annual Report. I use this peak demand value to calculate the peak savings % of peak demand.



4.6. Cost-Effectiveness

Benefit-Cost Ratios

NB Power evaluates cost-effectiveness using the All Fuels and NB Power PACT and PCT.²¹ The All Fuels tests include the costs and benefits from other funding sources, while the NB Power tests are focused on NB Power spending and associated benefits only. The energy efficiency portfolio is cost-effective with benefit-cost ratios ranging from 2.4 to 2.5 for the PACT and 1.5 to 1.6 for the PCT. The electrification program is cost-effective with benefit-cost ratios of 1.3 for the all fuels PACT and 3.4 for the all fuels PCT.²² The demand response program is cost-effective with benefit-cost ratios ranging from 1.7 for the PACT and 52.3 for the PCT.²³

²¹ NB Power's response to NBEUB IR-126b on page 239 confirms that, though reported, the TRC test is no longer in use as a measure of cost-effectiveness. The RIM test is not used in the Three-Year DSM Plan to screen programs. Both the TRC and RIM tests are calculated in the DSM Models for informational purposes only.

²² There is no NB Power funding for this program so there are no NB Power PACTs or PCTs.

²³ Demand response is only funded by NB Power so the All Fuels and NB Power PACT are the same as the All Fuels and NB Power PCT.

Table 7. DSM portfolio and program cost-effectiveness, 2024/25

Program Type	Sector	Program Name	PACT – All Fuels	PACT – NB Power	PCT – All Fuels	PCT – NB Power
Energy Efficiency	Residential	New Home Energy Savings Program	1.6	1.6	1.1	1.1
		Total Home Energy Savings Program	2.3	2.0	0.9	0.8
		Energy Efficient Products Program	2.7	2.7	6.5	6.5
	Residential Total		2.3	2.0	1.1	1.1
	LMI	Enhanced Energy Savings Program - electric	1.1	n/a	2.3	n/a
	LMI Total		1.1	n/a	2.3	n/a
	Commercial & Industrial	Commercial New Construction	2.4	2.4	1.2	1.2
		Business Rebate Program	2.6	2.6	1.5	1.5
		Commercial Buildings Retrofit Program	2.2	2.0	2.1	3.6
		Industrial EE Program	6.2	6.3	5.3	5.6
	Commercial & Industrial Total		3.6	3.0	2.4	2.2
	Total		2.4	2.5	1.6	1.5
	Electrification	LMI	Enhanced Energy Savings Program – oil transition	1.9	n/a	3.4
Demand Response	Commercial & Industrial	Peak Rebate Program	1.7	1.7	52.3	52.3

Notes:

- The tables are misnumbered in the NBPO2.61 2024_25 to 2026_27 DSM Initiatives Update. The table numbering in the sources is corrected to proceed sequentially.
- LMI NB Power PACT and PCT are n/a as NB Power does not fund these efforts.

Sources:

- NBPO2.61 2024_25 to 2026_27 DSM Initiatives Update Table 4: 2024/25 EE-DR Cost-Effectiveness Analysis: Program Administrator Cost Test – All Fuels, page 10.
- NBPO2.61 2024_25 to 2026_27 DSM Initiatives Update Table 5: 2024/25 EE-DR Cost-Effectiveness Analysis: Participant Cost Test – All Fuels, page 10.
- NBPO2.61 2024_25 to 2026_27 DSM Initiatives Update Table 6: 2024/25 EE-DR Cost-Effectiveness Analysis: Program Administrator Cost Test – NB Power, page 11.
- NBPO2.61 2024_25 to 2026_27 DSM Initiatives Update Table 7: 2024/25 EE-DR Cost-Effectiveness Analysis: Participant Cost Test – NB Power, page 11.
- Synapse recalculated the Energy Efficiency sector and portfolio totals to include the LMI Enhanced Energy Savings Program - electric (which was not in the original plan tables) and to exclude demand response.



The Total Home Energy Savings Program is the only program that is not cost-effective from the participant perspective, with All Fuel and NB Power PCTs of 0.9 and 0.8 in 2024/25, respectively.²⁴ In response to NBEUB IR-128i on page 249, NB Power states that it does not screen measures for cost-effectiveness and has no policy that requires that each measure be cost-effective. As a result, it is not possible to know why this program is not cost-effective. In its response to NBEUB IR-118b on page 225, NB Power states that the 2022/23 Total Home Retrofit Program Evaluation Report found lower actual energy savings per home than forecasted which affected program cost-effectiveness. NB Power is currently reviewing all eligible measures and program incentives, and the Federal Greener Homes Grant Program which provides funding for this program will undergo changes or be discontinued in April 2024. NB Power aims to understand the impacts of any Greener Homes Program changes before proposing any program updates.

The Peak Rebate and Energy Efficiency Products programs have very high PCTs of 52.3 and 6.5, respectively. The Industrial program also has relatively high PACT and PCT ratios of around 6.2 and 5.3 for all fuels, respectively.

NB Power includes avoided energy costs and avoided capacity as the benefits in its NB Power PACT. Avoided transmission capacity costs and avoided distribution capacity costs are missing, as are utility-related non-energy benefits.²⁵ In response to NBEUB IR-178 on page 317, NB Power confirmed that the avoided transmission and distribution capacity costs have not been updated to align with the 2023 Integrated Resource Plan and were therefore set to zero. This work is expected to be completed in 2024.

NB Power includes avoided all-fuels costs in its NB Power PCT. Avoided participant-related non-energy costs are missing. In response to NBEUB IR-127b on pages 243 and 244, NB Power states that participant non-energy benefits are defined as the additional benefits that accrue to participants in a DSM program beyond energy savings, and these benefits can include increased comfort, improved health, operations and maintenance cost savings, and increased property value. While all (i.e., 100 per cent) of the non-energy benefits are participant-related, they are applied to the Total Resource Cost Test and not the Program Administrator Cost Test and Participant Cost Test.²⁶

Cost of Saved Energy

Table 8 below provides a comparison of the cost efficiency of NB Power's proposed 2024/25 DSM Plan to leading, cold-climate jurisdictions in the United States and Canada. I examine the first year and levelized lifetime cost of saved electricity and first year and levelized lifetime cost of saved energy for

²⁴ This program is cost-effective for participants in 2025/26 and 2026/27.

²⁵ In its response to NBEUB IR-127a on page 243, NB Power states that utility non-energy benefits are defined as additional benefits that accrue to a utility beyond energy savings that reduce electricity system costs and these benefits can include reduced carrying costs on arrearsages, reduced shutoffs/reconnects, improved power quality/reliability, etc. NB Power also confirms that no utility-related non-energy benefits are included.

²⁶ While NB Power includes the TRC test results in its DSM Plan, I ignore these results in my assessment of the plan due to the fact that the test is no longer in use.

energy efficiency and first year cost of peak demand reduction for demand response. NB data is from the proposed 2024/25 DSM Plan, and I provide data with and without the low- and moderate-income programs. Data for all other jurisdictions is from 2021 and is converted to 2024 Canadian dollars.

- In general, NB Power's portfolio is challenging to directly compare to other jurisdictions due to differences in the data reported and differences in program emphasis. NB Power's programs may provide more funding to LMI customers, support more measures with longer lifetimes, invest more in audits and feasibility studies, and produce more savings from other fuels. These factors could drive the cost per saved unit of electricity and energy up for NB Power's energy efficiency portfolio as compared with other jurisdictions.
- NB Power's programs have higher costs per unit of first year and levelized lifetime electricity and energy saved than many leading Canadian and U.S. jurisdictions with LMI efforts included. After removing LMI efforts, these costs come down considerably to levels that are more reasonable and still on the higher end of the range of other jurisdictions.
- The U.S. and Canadian Energy Efficiency Scorecards do not provide good comparisons for the demand response cost of saved peak demand. In the Canadian scorecard, costs are not broken out separately though savings are broken out. In the U.S. scorecard, neither savings nor costs are not provided separately for demand response programs.



Table 8. Comparison of key cost efficiency-related performance metrics across select Canadian and U.S. jurisdictions

Jurisdiction	First Year Cost of Saved Electricity (\$/kWh)	Levelized Cost of Saved Lifetime Electricity (\$/kWh)	First Year Cost of Saved Energy (\$/GJ)	Levelized Cost of Saved Lifetime Energy (\$/GJ)	First Year Cost of Peak Demand Reduction (\$/kW)
Canada	PE	\$1.26	NA	\$173	NA
	BC	\$1.09	NA	\$141	NA
	NB	\$1.05	\$0.12	\$209	\$23
	NB (without LMI)	\$0.61	\$0.07	\$121	\$14
	NS	\$0.78	NA	\$135	NA
	QC	\$0.49	NA	\$67	NA
	ON	\$0.39	NA	\$54	NA
United States	MA – National Grid	\$0.95	\$0.18	NA	NA
	MA – Eversource	\$0.90	\$0.13	NA	NA
	OR – PGE	\$0.60	\$0.07	NA	NA
	NY - LIPA	\$0.39	\$0.04	NA	NA
	MI - Consumers	\$0.34	\$0.04	NA	NA
	IL - Ameren	\$0.32	\$0.04	NA	NA
	IL – Com Ed	\$0.27	\$0.04	NA	NA
	MI - DTE	\$0.27	\$0.04	NA	NA
	MN - Xcel	\$0.25	\$0.02	NA	NA
	CO - Xcel	\$0.24	\$0.02	NA	NA
	NY – Con Ed	\$0.23	\$0.03	NA	NA
NY – National Grid	\$0.19	\$0.02	NA	NA	

Notes:

- The U.S. and Canadian Energy Efficiency Scorecards provide different metrics for assessing program performance. An “NA” indicates data that is not available from the scorecard. Data for U.S. jurisdictions is related to energy efficiency efforts and not demand response efforts, and therefore was not included.
- The Canadian scorecard includes natural gas energy efficiency program spending and savings (in GJ totals). Synapse added electricity savings to natural gas and non-regulated fuels GJ in its \$/GJ calculation for Canadian provinces.

Sources:

- U.S.: Specian, M., W. Berg, S. Subramanian, and K. Campbell. 2023. 2023 Utility Energy Efficiency Scorecard. Washington, DC: ACEEE. [aceee.org/research-report/U2304](https://www.aceee.org/research-report/U2304).
- Canada (not NB Power): Gaede, J., Nippard, A., Haley, B., Linders, A. 2022. The 2022 Canadian Energy Efficiency Scorecard: Provinces and Territories. Efficiency Canada, Carleton University, Ottawa, ON.
- Synapse calculated cost of saved electricity and energy based on 2024/25 cost and annual savings data in Matter 552, NB Power 2024-2025 General Rate Application, Appendix AJ - 2024-25 to 2026-27 DSM Initiatives Update and lifetime savings from NBEUB IR-117d and e, page 214. To calculate the levelized cost of saved electricity and energy, I apply the measure life as calculated by dividing the lifetime savings by the annual savings and a real discount rate of 5.99 percent (which is used by NB Power in its benefit cost modeling).
- NB Power Cost of Peak Demand Reduction from NBEUB IR-250a, page 101 and includes demand response efforts only.

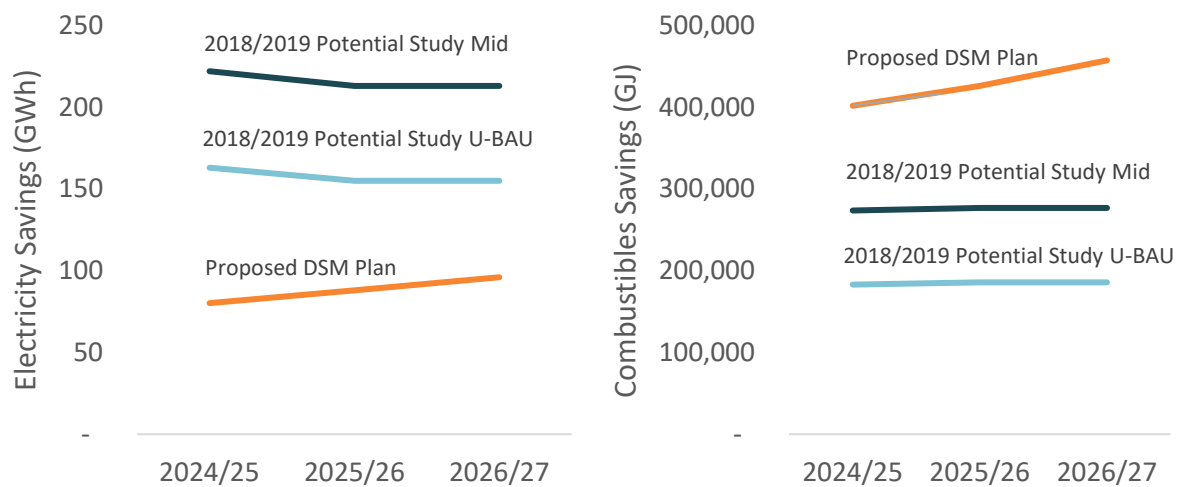


4.7. Potential Study

NB Power’s response to NBEUB IR-107b provided net achievable annual savings for electricity and combustible energy efficiency for 2024/25, 2025/26, and 2026/27 under the unconstrained, business-as-usual (U-BAU) and Realistic (mid) scenarios from the 2018/19 Potential Study as shown in Figure 6 below.²⁷

- The proposed electricity savings in the 2024/25 to 2026/27 DSM Plan are lower than the achievable GWh potential.
- The proposed combustibles savings are higher than the achievable GJ potential.

Figure 6. Energy efficiency potential from 2018/2019 study as compared to NB Power’s DSM Plan



Sources:

- Potential from NBEUB IR-107b, page 193.
- NB Power annual energy savings from Matter 552, NB Power 2024-2025 General Rate Application, Appendix AJ - 2024-25 to 2026-27 DSM Initiatives Update.

In its response to NBEUB IR-107b on pages 194 and 195, NB Power noted that the 2018/19 Potential Study provided an assessment for two scenarios of customer-sided solar PV generation potential for 2024/25 to 2026/27. The achievable potential was 17 GWh for the business-as-usual scenario with no customer incentives for equipment and net-metering conditions existing at the time of the study and 20 GWh for the mid scenario, with customer incentives for the solar PV panels. In its response to NBEUB IR-107f, NB Power noted that no specific amount of funding is set aside for renewable energy projects in the DSM Plan and there is no plan to capture the achievable potential.

²⁷ In its response, NB Power noted that a key distinction between scenarios is the level of incentives provided to program participants.

In its response to NBEUB IR-107f, NB Power noted that the 2018/19 Potential Study did not assess the achievable potential of electrification programs. The 2018/19 Potential Study assessed the cumulative impacts of normally occurring space and water heating electrification only for the residential and commercial sector (in the absence of any specific incentives promoting building electrification) of 50, 67, and 84 GWh for 2024/25, 2025/26, and 2026/27, respectively. In its response to NBEUB IR-121c on page 229, NB Power noted that the level of electrification pursued in the Enhanced Energy Efficiency Program – oil transition in the DSM plan is determined by the level of funding provided by provincial and federal funding sources to pursue their home heating oil transition objectives. In its response to NBEUB IR-107d, NB Power noted that the Enhanced Energy Efficiency Program – oil transition was not designed to capture all the achievable potential for electrification and that no assessment of the achievable electrification potential has been conducted.

In its response to NBEUB IR-107b on page 194, NB Power provided demand response achievable potential for 2024 associated with three scenarios based on different strategies to achieve peak demand savings: a combination of time-of-use rates and large industrial customer curtailment with 146 MW of potential, a scenario targeting equipment in homes and businesses and large industrial customer curtailment with 176 MW of potential, and a scenario where only large industrial customer curtailment is used for demand response with 151 MW of potential. NB Power’s proposed demand response program peak demand reductions are less than half of the achievable potential.

4.8. Alignment of DSM Plan and AMI

In its response to EUB staff interrogatories, NB Power confirmed that mass deployment of AMI meters was delayed to November 2023 due to meter shortages (NBEUB IR-110, page 199). The current deployment schedule is as follows:

- August 2021–July 2022: Implementation of back-end infrastructure, integration with NB Power systems, and rollout of a small number of AMI meters to test the system end-to-end
- November 2023–October 2025: Mass deployment of AMI meters (NBEUB IR-242c, page 88)

According to NB Power, approximately 35 percent of all net metering customers and 7.8 percent of NB Power’s customers are currently using AMI Meters (NBEUB IR-113a, page 203 and NBEUB IR-141, page 267). NB Power will use AMI meters in place of net meters (NBEUB IR-113, page 203).

NB Power is using the AMI data from the small portion of the meters that have been installed in the following ways:

- as part of the load research sample, which will inform future ratemaking and system planning (NBEUB IR-108 and IR-109, pages 197 - 198)

- to develop a portal project that will allow customers to see more granular details of their consumption and to develop the Energy Usage Alert program, neither of which have launched (NBEUB IR-108, page 197)

For the Peak Rebate program,²⁸ NB Power proposes to allocate \$148,000 in 2024/25, \$166,000 in 2025/26, and \$54,000 in 2026/27 of the Peak Rebate program spending to the installation of interval meters for eligible program participants (NBEUB IR-141, pages 267 and 268). It is not clear why NB Power is installing interval meters rather than AMI meters for program participants.

Regarding future uses of AMI, NB Power has engaged a consultant to research how to best utilize AMI for demand-side management evaluation, measurement, and verification activities; this research will inform next steps for the coming years (NBEUB IR-109, page 198). NB Power also plans to leverage smart meter capabilities to implement conservation voltage reduction, which would not be implemented as part of the DSM Plans (NBEUB IR-112, pages 201 and 202).

NB Power is not planning to use AMI for comparisons with peer customers (NBEUB IR-109, page 198). Comparisons with peer customers generally include home energy report programs, which can provide a small percentage of savings if the program is designed well. NB Power is also not planning to conduct end-use disaggregation using AMI data (NBEUB IR-109, page 198). End-use disaggregation or analysis of energy consumption using AMI data can reveal patterns or spikes in electricity use, which might indicate inefficient types of end-use equipment that a demand-side management program could address through incentives to replace or other means. Combined with demographic and building stock data, analysis of AMI data can help to identify groups of customers who are good candidates for energy efficiency upgrades. Using such analysis to design demand-side management programs, NB Power could make its programs more effective—potentially improving their reach and the depth of savings per participant. Customer privacy regulations or agreements serve as an important consideration for how AMI data analysis can be used.

5. FINDINGS AND RECOMMENDATIONS

In this section, I provide my findings and recommendations. I start with a general summary of the most significant findings and follow with more detail and recommendations in specific topic areas.

General

NB Power’s DSM portfolio includes energy efficiency, demand response, electrification, and renewable energy measures. It addresses a variety of market segments and customer types. NB Power can be commended for its LMI funding levels, which exceed other jurisdictions and are commensurate with the

²⁸ Those who are in the AMI deployment area and do not currently have an interval or advanced meter on site.

proportion of the population represented by these customer types. NB Power's DSM Plan includes an electrification effort specifically targeted to low-income customers with oil heating, in alignment with the federal government's push to eliminate oil heating by 2030. And, NB Power proposes to phase out incentives for oil measures for all customers during the 2024/25 Program Year (NBEUB IR-260f, page 118). I agree with NB Power's decision to redesign parts of its Energy Efficient Products program and Total Homes Energy Savings Program with an eye towards increasing cost-effectiveness and address its long waitlist for LMI program services within the next two years.

However, the utility is not proposing to achieve its minimum savings targets, and its proposed savings levels are well below many other Canadian and U.S. jurisdictions. There are notable gaps in its program offerings. Also, NB Power is providing incentives for existing oil customers to convert to gas and biomass (a renewable energy measure) which may preclude the province from reaching its carbon reduction goals in future years (NBEUB IR-128n and o, Pages 249 and 250).

The three-year DSM Plan was not well documented and did not appear to be materially different than the DSM Plan Initiative Updates provided in previous years. I spent considerable effort developing interrogatories to fully understand and complete the record regarding the proposed plan. In their DSM plans or in response to interrogatories, program administrators should be able to identify the measures and associated incentives within each program and provide information on whether the measures are cost-effective for participants and the utility, all of which were missing from NB Power's plan. Cost-effectiveness should be reported for all programs, regardless of whether the source of funding is NB Power or some other source.

While I agree that cost-effectiveness should be assessed at the program and portfolio levels (as is currently done by NB Power), this does not preclude NB Power from calculating measure-level cost-effectiveness or assembling its proposed DSM Plans based upon measure-level data. More detailed information on the costs (including the incentive and participant costs), savings, benefits, and cost-effectiveness of individual measures (heat pumps for electric and other fuels customers), measure types (renewables vs. energy efficiency), and end uses (i.e. lighting and HVAC) is required to evaluate whether the plan is as effective and cost-efficient as it can be. In particular, renewable energy efforts should be shown separately from energy efficiency measures. I recommend that NB Power be required to build its DSM Plans with measure-level detail.

Lastly, the PACT and PCT cost-effectiveness calculations are incomplete and underestimate the cost-effectiveness of the DSM Plans. The PACT is missing avoided transmission, avoided distribution, and non-energy benefits. The PCT is missing non-energy benefits.

Compliance with DSM Plan Requirements

Table 9 below shows that NB Power is not proposing to achieve prescribed minimum savings levels (as a percent of electricity sales) for the relevant DSM Plan years. The proposed electric savings targets are significantly lower than the economic potential established in the 2018/19 Potential Study and NB Power stated that there is additional cost-effective potential not being achieved (NBEUB IR-115a, page 206). While it is true that the minimum targets are growing over time, I do not view the targets in these

years as particularly high or difficult to attain. Given how low the targets are relative to targets for other jurisdictions, I recommend that NB Power’s DSM Plan exceed the minimum savings targets in all years. NB Power’s DSM Plan has gaps in its program offerings, which it can address to attain its targets.

Table 9. Comparison of NB Power proposed DSM Plan with requirements

	Minimum Savings % of Sales Requirements	NB Power Proposed Savings % of Sales
2024/25	0.550%	0.510%
2025/26	0.600%	0.597%
2026/27	0.650%	0.644%

Sources:

- NB’s targets are from Energy Efficiency Regulation – Electricity Act. Section 117.24.
- 2024/25 to 2026/27 DSM Savings and Sales from Matter 552, NB Power 2024-2025 General Rate Application, Appendix AJ - 2024-25 to 2026-27 DSM Initiatives Update.

I also recommend the Province consider updating its minimum electricity savings requirements to be more in line with the established targets in other jurisdictions and the jurisdiction’s updated potential and reflect desired savings levels rather than minimum savings levels. NB Power is planning on conducting another potential study starting in 2024/25. This study should include energy efficiency, demand response, electrification, and renewable energy and it should include breakouts of this potential by heating fuel type and customer type (including for LMI customers). The demand response portion of the study should include an assessment of Residential potential, including potential associated with heat pump water heaters, EVs, and batteries. The Province could also consider establishing electrification, demand response, and renewable energy targets for NB Power, based upon the updated potential.

Support for LMI customers

NB Power funding is relatively stable over time. However, funding from other sources (which LMI programs rely on completely) is variable and uncertain for the 2025/26 and 2026/27 plan years. As a result of a lack of LMI program funding commitments, NB Power shows a significant decline in LMI program funding in these years.

Additionally, demand for LMI programs far exceeds existing program funding levels, which is causing a substantial wait list for service. Further, the current funding does not support comprehensive demand-side management for LMI customers as it only addresses electrification and weatherization.

Program funding for LMI customers should be consistent, certain, and not limited to a subset of measures provided to other customers. I recommend the Province work with NB Power and other stakeholders to secure other funding sources so these issues can be addressed. LMI customers and their advocates should be included in all discussions.

Support for electrification

NB Power has an electrification program for LMI customers, but not for other Residential, Commercial, and Industrial customers. Given the Province's intention of eliminating oil use for heating by 2030, NB Power should have an electrification program for its other customers—especially customers who heat with oil. If regulations preclude NB Power from using ratepayer funding to support this program, it would need to be funded by other sources. To control costs, NB Power could consider differentiating its incentives by heating fuel type and offering higher incentives for full replacement versus partial replacement of heating systems with heat pumps. Also, the redesign of the Energy Efficient Products program should incorporate upstream and/or midstream incentives for heat pumps to support electrification for non-LMI customers at a lower cost.

NB Power's incentives currently support conversions from oil to gas. This may erode future electrification opportunities and impact the Province's ability to reach its carbon reduction goals. I recommend that NB Power consider phasing out incentives for gas heating systems, as it is doing for oil.

Support for demand response

Demand response programs may be important for NB Power given that the region is winter peaking and electrification will exacerbate these winter peaks. However, NB Power's demand response programs are not well integrated with its energy efficiency offerings and do not include program offerings for Residential customers. NB Power's demand response incentives for Commercial and Industrial customers result in an extremely high benefit for participants, suggesting that the new incentives (which doubled from \$25/kW to \$60/kW in 2023/24) may be too high for some customers.

In response to NBEUB IR-272b on page 134, NB Power states that NB Power worked with Dunskey Energy Consulting in 2022, "to assess Distributed Energy Resource (DER) opportunities, analyze cost effectiveness and conduct a jurisdictional scan of DER practices for 10 American Utilities" and provides the final report as an attachment. NB Power further states that the report concludes "that the majority of DERs in the residential sector are not cost effective in the near or midterm." Page 12 of the report indicates that Dunskey identified several high priority opportunities for Residential customers, such as water heating and EVs. In alignment with Dunskey's recommendations, I suggest that NB Power develop pilots to further pursue these opportunities.

Support for renewable energy

NB Power incentivizes solar, wind, and biomass and it states that solar is popular with its customers.²⁹ NB Power provides the same \$120/GJ incentive for wind, solar, and biomass (NBEUB IR-136a on page

²⁹ NPB 2.63, Part A - Appendix AJ 2024-25 to 2026-27 Commercial Building Retrofit Program Implementation Plan, page 18 states, "The feasibility study allowance has begun to generate participation especially in the renewable sector with solar being the most popular."

261), despite the fact that the costs for each resource are very different.³⁰ NB Power stated that it is not currently able to provide breakouts of the costs, savings, benefits, and cost-effectiveness for renewable energy versus energy efficiency measures and by each renewable energy resource (NBEUB IR-128u, pages 250 and 251). I suggest a detailed review of the level of proposed renewable investments and the associated incentives to determine if these investments are reasonable and cost-effective. Also, it is necessary to understand how the cost-effectiveness of the renewable energy measures compares to the energy efficiency measures given the current incentive levels.

Cost-effectiveness

I recommend that NB Power’s incentives in the Peak Rebate, Energy Efficient Products, and Industrial EE programs be examined in further detail and potentially lowered to reduce the cost of these programs and curb any unnecessary windfall for program participants. Upstream and/or midstream incentives should be incorporated into the Energy Efficient Products program to reduce costs. I also support NB Power’s efforts to redesign its Total Energy Savings Program to be cost-effective for participants.

I support NB Power’s intention to address the gaps in its evaluation of cost-effectiveness, such as avoided transmission and distribution costs. However, NB Power has not committed to addressing all the gaps. NB Power stated that utility-related non-energy benefits should not be included in the PACT and that participant-related non-energy benefits should not be included in the PCT as the *National Standard Practice Manual for Benefit-Cost Analysis of Distributed Energy Resources*³¹ does not support it. This is incorrect. This reference document, referred to as the NSPM, does support including these benefits. Regarding the PACT and PCT, Tables S-6 and S-7 on page xi of the NSPM show credit and collection costs included as a benefit to the electric utility system and host customer and low-income non-energy impacts included as a benefit or cost to the host customer. Regarding the PCT, page E-4 of Appendix E in the NSPM states, “The PCT should account for all benefits experienced by the host customer, including bill savings and non-energy benefits.” I recommend NB Power include its utility-related non-energy benefits in the PACT and its participant-related non-energy benefits in the PCT.

Alignment of DSM Plan and AMI

As proposed, the Peak Rebate Program could be better coordinated with the rollout of AMI. It is not clear why DSM Plan spending is allocated to the installation of interval meters when AMI could be installed instead.

AMI data could be used to improve existing program designs using analysis of energy consumption and energy-use patterns help to identify customers who are good candidates for energy efficiency upgrades,

³⁰ 2023. Lazard. *Levelized Cost of Energy Analysis—Version 16.0*. Available at: <https://www.lazard.com/research-insights/2023-levelized-cost-of-energyplus/>.

³¹ 2020. *National Standard Practice Manual for Benefit-Cost Analysis of Distributed Energy Resources*. Available at: https://www.nationalenergyscreeningproject.org/wp-content/uploads/2020/08/NSPM-DERs_08-24-2020.pdf.

thus making current programs more effective. DSM programs can be designed to target services to a cohort of customers that would benefit from similar program delivery and investments. NB Power should investigate the benefits and challenges to AMI data analysis to improve its programs.

In summary, I recommend that the Board:

- approve the energy-efficiency-related budgets and savings proposed by NB Power for the 2024/25 and 2025/26 program years.
 - Direct NB Power to provide updates when the Energy Efficient Products and Total Homes Energy Savings programs are redesigned and as more funding from other sources becomes available, as this may occur during these years.
 - Direct NB Power to file (in its next rate case) a revised DSM plan that addresses the deficiencies identified in this report, particularly regarding the level of detail available in the benefit-cost analysis models and plan documentation.
 - Direct NB Power to include energy efficiency, demand response, electrification, and renewable energy measure types in its upcoming potential study, and include breakouts of the achievable potential by heating fuel type and customer type (including for LMI customers) in addition to by measure type and end use.
- approve the electrification budgets and savings proposed in the DSM Plan and work with stakeholders to allocate more funding to energy efficiency and electrification for LMI customers in order to eliminate the wait list for service and provide comprehensive services for these customers.
- reject the renewable energy efforts and conduct a detailed review of the level of proposed renewable investments and the associated incentives. It is not possible to determine if these investments are reasonable and cost-effective without understanding the proposed investments. Renewable energy efforts should be shown separately from energy efficiency measures. This is necessary for understanding how the cost-effectiveness of the renewable energy measures compares to the energy efficiency measures given the current incentive levels.
- approve the demand response program for now, conduct a review of performance and incentives after the 2023/24 program year is complete to determine if changes to the incentive are warranted, and direct NB Power to propose a pilot program for Residential customers based upon an assessment of Residential achievable demand potential from its upcoming 2024/25 potential study. Also, NB Power should clarify how its plans for demand response resources in the near term correspond with its IRP, which does not incorporate demand response until 2030.
- call on NB Power to investigate the benefits and challenges of using AMI data analysis to improve its DSM programs, and require NB Power to better coordinate AMI with the Peak Rebate Program.

I also recommend the Province update its minimum electricity savings requirements to be more in line with the established targets in other jurisdictions and the jurisdiction's updated potential, direct NB Power to pursue all-cost-effective energy efficiency, and establish provincial targets that better reflect a desired level of performance rather than a minimum level of performance. I also recommend the Province consider establishing targets for demand response, renewable energy, and electrification efforts in addition to energy efficiency.

