Consortium for Energy Efficiency

2022 State of the Efficiency Program Industry

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Purpose and Limitations

The purpose of this report is to provide a point in time report of US and Canadian program industry energy efficiency and demand response budgets, expenditures, and savings and an annual time series analysis. While this effort constitutes a large and comprehensive survey of program administrators, and while extensive ongoing attention is devoted to data standardization, CEE cautions against making representations and comparisons beyond those provided in this report.

The report documents annual electric and natural gas DSM program industry budgets, expenditures, and impacts at the national level and, where appropriate, by Census region, across the United States and Canada based on data collected through a vast and comprehensive survey of DSM program administrators. CEE believes that using these data in conjunction with past survey efforts portrays an accurate representation of energy efficiency program industry trends over time. The limitations of the data are disclosed below.

There are many limitations to budget, expenditures, and savings data in the DSM industry. The accuracy of the data is ultimately dependent upon each individual respondent's interpretation of the survey questions, ability to retrieve the relevant information, and verification of the data provided. Furthermore, variation in state policies and reporting requirements along with what we suspect is inconsistent use of terminology likely adds to variation.

Additional factors that affect the viability of comparisons or analytical inferences include differences in regulatory structures, weather effects, customer demographic differences, electric and gas rates, the duration of program experience, and underlying drivers that shape a program administrator's portfolio.

Given the wide variation in the circumstances surrounding individual data points, we do not believe these data are suitable for comparisons at any level other than the levels represented within this report. CEE encourages reviewers to inquire as to the sufficiency of the method or quality of supplemental data for the specified purpose when using this information beyond the stated limits.

Acknowledgements

This report was made possible by partnerships with the American Gas Association and Efficiency Canada, who shared the results of their utility surveys with CEE. Thank you to Morgan Hoy, Miles Vondra, Juan Alvarado, and James Gaede for your ongoing generous collaboration.

The preferred citation the Annual Industry Report is as follows:

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Please state clearly in your analysis that whereas you are "using CEE data, the analysis is yours alone."

Contents

Executive Summary

For the seventeenth consecutive year, CEE has investigated the size and scope of the demand side management (DSM) industry in the United States and Canada, for both gas and electric programs. The purpose of this report is to capture the total spent on, and energy saved by, DSM programs, and track trends in the industry over time.

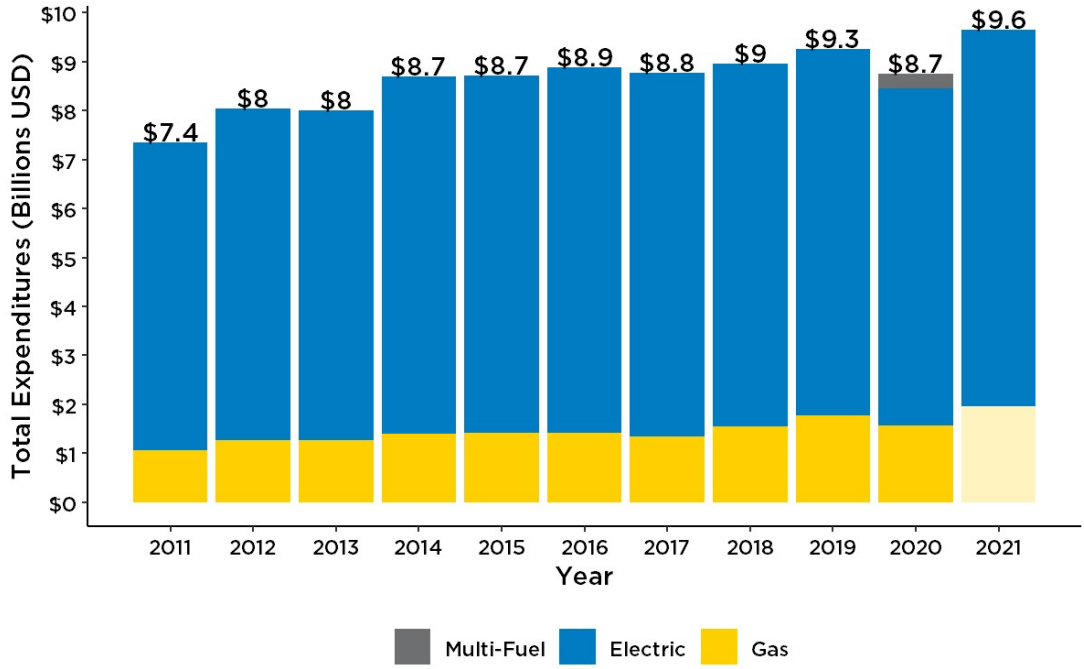
Data Collection Methodology

CEE modified our data collection approach in 2022 to reduce the burden on program administrators and avoid duplicating compilation efforts of peer organizations. Instead of directly surveying program administrators, we report data collected by three other organizations: American Gas Association (AGA), Efficiency Canada, and the US Energy Information Administration (EIA). Because of the updated methodology, we caution against making comparisons beyond those provided in this year's report, particularly for demand response and Canadian data. This year, the response rate for US gas utilities was lower than usual, and next year's report will include a retroactive update of 2021 US gas values, if additional information is available - see the Methodology section.

North American Program Expenditures Rebound from 2020 Decline

In 2021, combined spending on gas and electric DSM programs across the United States and Canada totaled $9.6 billion, approximately a ten percent increase from 2020 spending.

Figure 1. **US and Canadian Gas and Electric DSM Program Expenditures, 2011-2021**



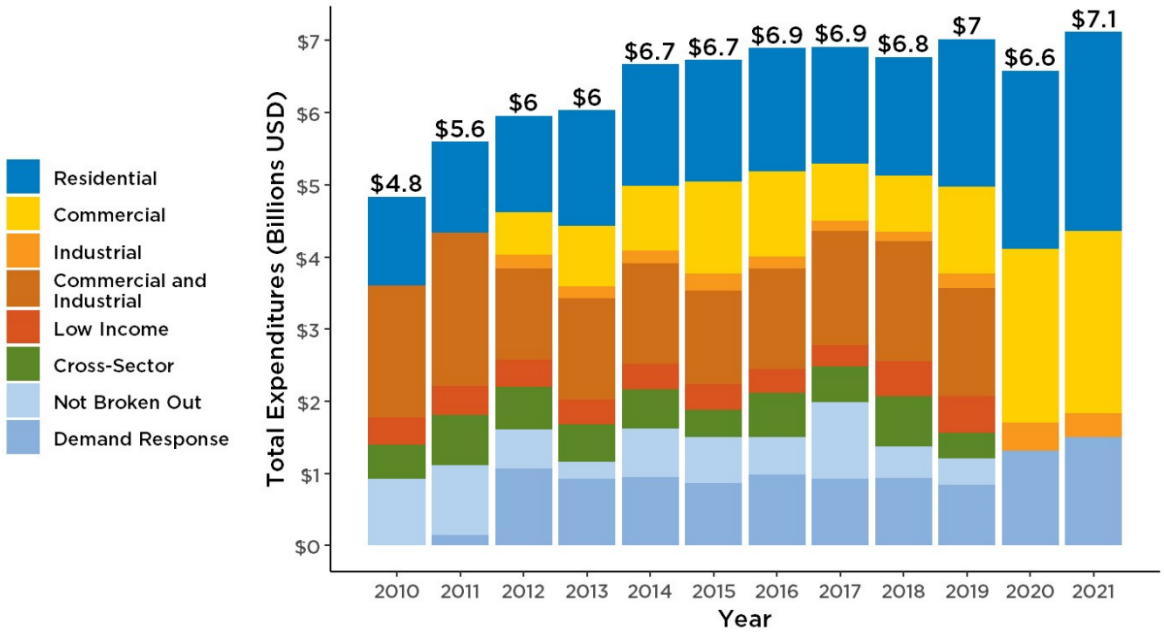
Note: Gas expenditures in 2021 are shaded lighter to indicate that 2021 survey results are incomplete and have been interpolated from previous years (2020 n = 74, 2021 n = 45). In 2023, we anticipate AGA will retroactively update missing data for 2021. We were also able to allocate more of the multi-fuel spending reported by Efficiency Canada to electric and gas in 2021 than in 2020. Canadian multi-fuel spending (grey bar in 2020) was retroactively added to 2020 expenditures this year to express total NA DSM expenditures.

These expenditures suggest a return to the steady industry spending growth observed over the past decade after temporary decreases in spending during the COVID-19 pandemic. With increased binational policy focus on energy efficiency and decarbonization at the regional and national level, most notably through the Inflation Reduction Act of 2022, we expect that this robust utility energy efficiency spending will persist next year.

Increase in Electric Spending with Consistent Savings

Spending on electric efficiency programs in the United States increased in 2021 to around $7.1 billion from $6.6 billion in 2020.

Figure 2. US Electric DSM Expenditure by Sector, 2010-2021



Canadian electric spending was $334 million USD in 2021. For a more comprehensive view of Canadian expenditures over time, please visit the full Efficiency Canada report. [1,2]

US and Canadian DSM programs have saved approximately 30,000 GWh (26,911 in the US and 2,964 in Canada), which is a slight decline from 2020 savings of 31,438 GWh (29,669 in the US and 1,739.4 in Canada). Savings in the United States declined by around 2,760 GWh from 2020 savings. That decline in US electric savings is offset somewhat by the 2,964 GWh saved in Canada, which is an increase from the 1,740 GWh saved in 2020.

Consistent Gas Savings in 2021, Increase in Expenditures

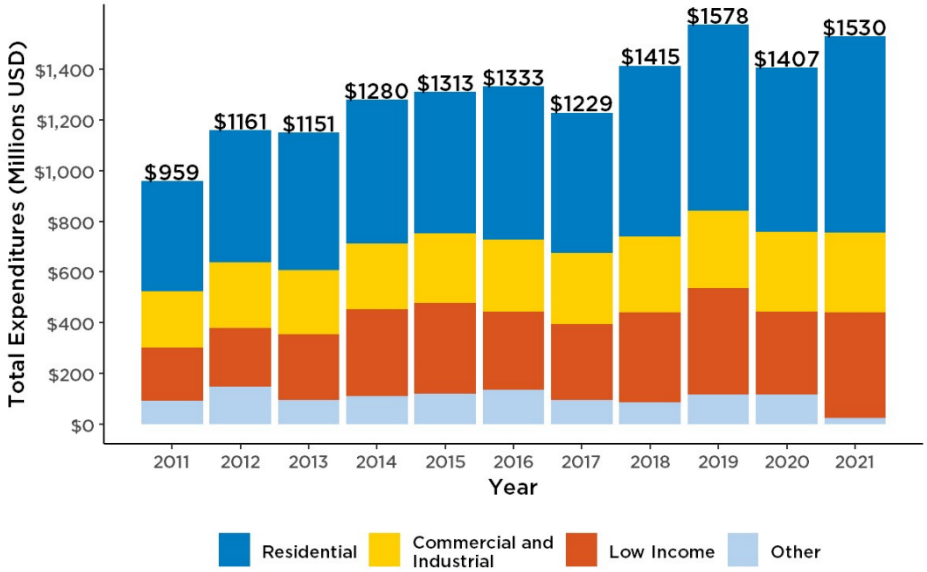
Gas expenditures in the United States increased to about $1.5 billion in 2021 from $1.4 billion in 2020 (Figure 3). 2021 North American natural gas savings amounted to 456 million therms (349 million in the US and 107 million

[1] This estimate does not fully capture Canadian spending on undifferentiated fuels. Because of jurisdictional reporting, the Efficiency Canada Scorecard allocates a substantial proportion of spending to multi-fuels rather than to electric or gas spending specifically. We were able to allocate relatively more of this undifferentiated spending to each fuel in 2021 than 2020, which may slightly inflate total North American numbers and we urge readers to consult Efficiency Canada's report for trends over time.

[2] Gaede, J., Nippard, A., Haley, B., Linders, A. 2022. The 2022 Canadian Energy Efficiency Scorecard: Provinces and Territories. Efficiency Canada, Carleton University, Ottawa, ON.

in Canada) which is consistent and even a slight increase from 2020 savings of 395 million therms (324 million in the US and 71 million therms in Canada).

Figure 3. US Natural Gas Program Expenditures by Sector, 2011-2021



Note: 2021 Gas data is incomplete; 2020 n=74, 2021 n=45. In 2023, we anticipate AGA will retroactively update missing data for 2021.

Natural gas spending in Canada was $210 million USD in 2021. For a more granular perspective on Canadian expenditures including multi-fuel spending, visit the full Efficiency Canada report.[3]

[3] Gaede, J., Nippard, A., Haley, B., Linders, A. 2022. The 2022 Canadian Energy Efficiency Scorecard: Provinces and Territories. Efficiency Canada, Carleton University, Ottawa, ON.

1 Introduction:

Energy efficiency in 2021 in North America has largely rebounded from the disruptive influence of COVID-19 observed in 2020. We are currently seeing renewed investment in both gas and electric demand side management, in line with the previous growth trajectory of our industry.

As North America continues to experience more and more challenges related to a shifting climate, policy makers are scaling up efforts to decarbonize the power system. Energy efficiency remains a least cost tool to achieve decarbonization goals.[4] This trend is exemplified in the United States with the passing of the Inflation Reduction Act (IRA) by the Biden Administration on August 16th 2022. The IRA stipulates over eight billion USD of investment into energy efficiency programs aimed at home retrofits and the installation of efficiency electric technology in low-to-moderate income (LMI) households, as well as tax credits for efficient heat pumps. Although this money had yet to be injected into the industry at the time of this report, it signifies the importance of harnessing energy efficiency as a pathway to decarbonization. We expect energy efficiency will remain a critical part of decarbonization efforts in North America as a valuable resource in supporting the grid resiliency and reliability as electrification grows in its reach.

Data Collection Methodology

CEE modified our data collection approach last year to reduce the burden on program administrators and avoid duplicating compilation efforts of peer organizations. Instead of directly surveying program administrators, we report data collected by three other organizations: American Gas Association (AGA), Efficiency Canada, and the US Energy Information Administration (EIA). Because of the updated methodology, we caution against making comparisons beyond those provided in this year's report, particularly for demand response and Canadian data, because of the different reporting methods. Appendix A includes historical comparisons of the two methodologies.

This year's data for American gas utilities is incomplete and comparisons should not be made outside of this report. In 2021, AGA heard from 79 utilities, and in 2022 they heard from 45 utilities. Next year's report may include a retroactive update of 2021 US gas values if additional data are collected.

Similar to past years, for US gas data (which is collected by survey response by AGA) we carry over information from the previous year for program administrators that did not respond to surveys in 2022. This missing data estimation allows us to estimate overall North American

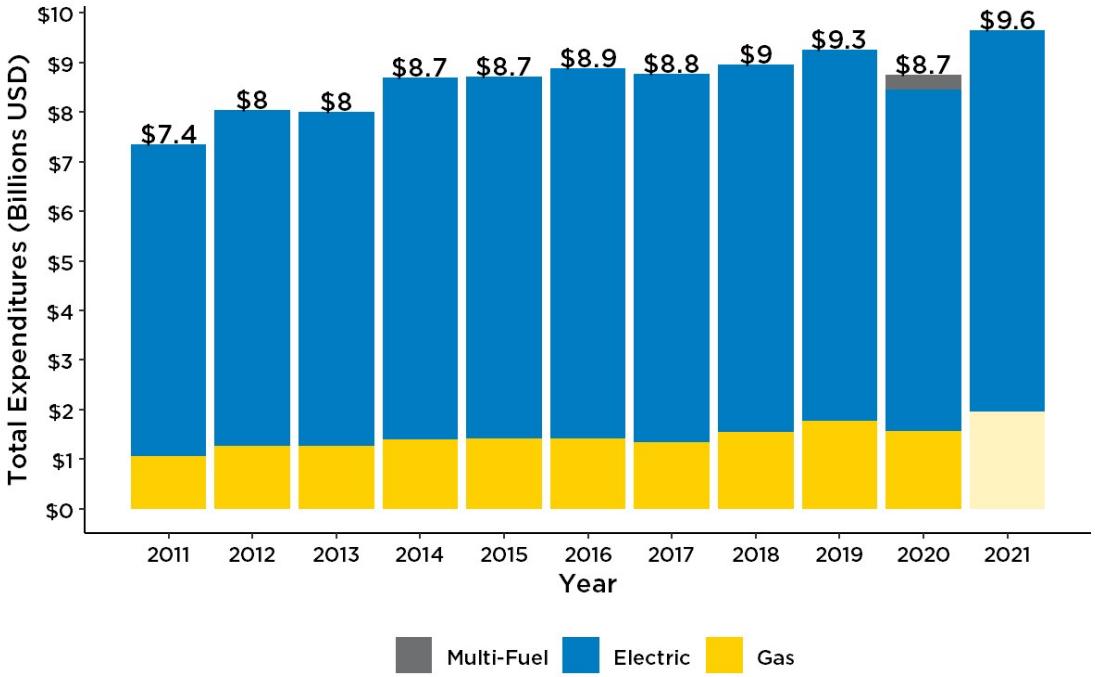
[4] E.g., Specian, M., and A. Bell-Pasht. 2023. Energy Efficiency in a High Renewable Energy Future. Washington, DC: ACEEE.

program activity rather than assume totals for nonresponsive program administrators is zero. If a program administrator has not responded in one year, we carry over 100% of their most recent reported budgets and savings. After two years of non-response, we carry over 50% of their most recent reported budgets and savings. If a program administrator has not responded in three years, we assume zero expenditures and savings. For each program administrator where data is carried over from the previous year, we further adjust savings and expenditures by the average rate of change in received responses from 2021 to 2022 surveys to account for general industry trends. That is, we assume that average budget changes among respondents that report also apply to respondents that do not report. Thus, estimates of gas expenditures and savings in this report conservatively interpolate findings for nonrespondents.

2 North American Expenditures

In 2021, combined spending on gas and electric DSM programs across the United States and Canada totaled $9.6 billion, approximately a 10% percent increase from 2020 spending (Figure 4). These expenditures suggest a return to previous trends in steady industry growth.

Figure 4. US and Canadian gas and Electric DSM Program Expenditures, 2011-2021



Note: Light yellow indicates that 2021 gas data is incomplete; 2020 n=79, 2021 n=45. In 2023, we anticipate AGA will retroactively update missing data for 2021. We were able to allocate more of the multi-fuel spending reported by Efficiency Canada to electric and gas in 2021 than in 2020. Canadian multi-fuel spending (grey bar in 2020) was retroactively added to 2020 expenditures this year to express total NA DSM expenditures.

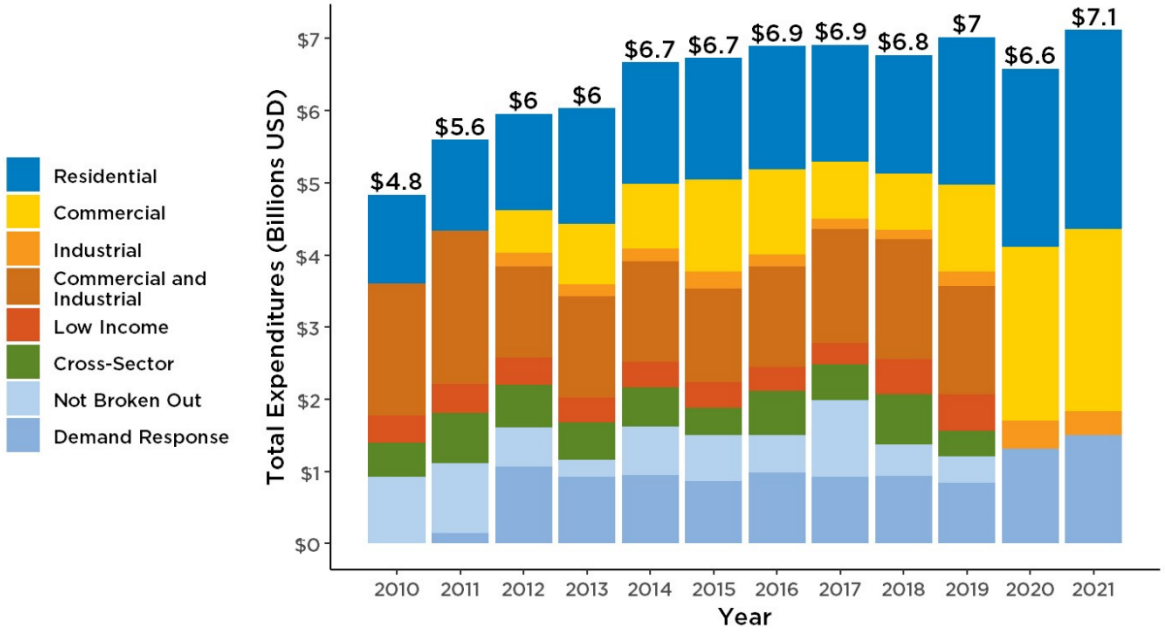
With more and more regulatory attention and government support of energy efficiency in the US as a way to tackle decarbonization, we expect that this increased spending will persist beyond 2021.

3 Changes in Electric Savings and Expenditures

3.1 Spending on Electric Programs in 2021

In 2021, US electric energy spending increased by approximately seven and a half percent from 2020 levels, from $6.6 billion to $7.1 billion (Figure 5). The 2020 and 2021 figures were derived from a different source (EIA Form 861) than the previous data points, which were derived from CEE's Annual Industry Report survey. As a result, the sector breakdowns for 2020 and 2021 and previous years are not identical as EIA captures fewer categories than the previous survey. Compared to last year's EIA data, residential (and low-income) spending increased by approximately 12 percent and combined commercial and industrial spending increased by approximately two percentage points. Demand response (DR) spending increased by 14 percent compared to last year.

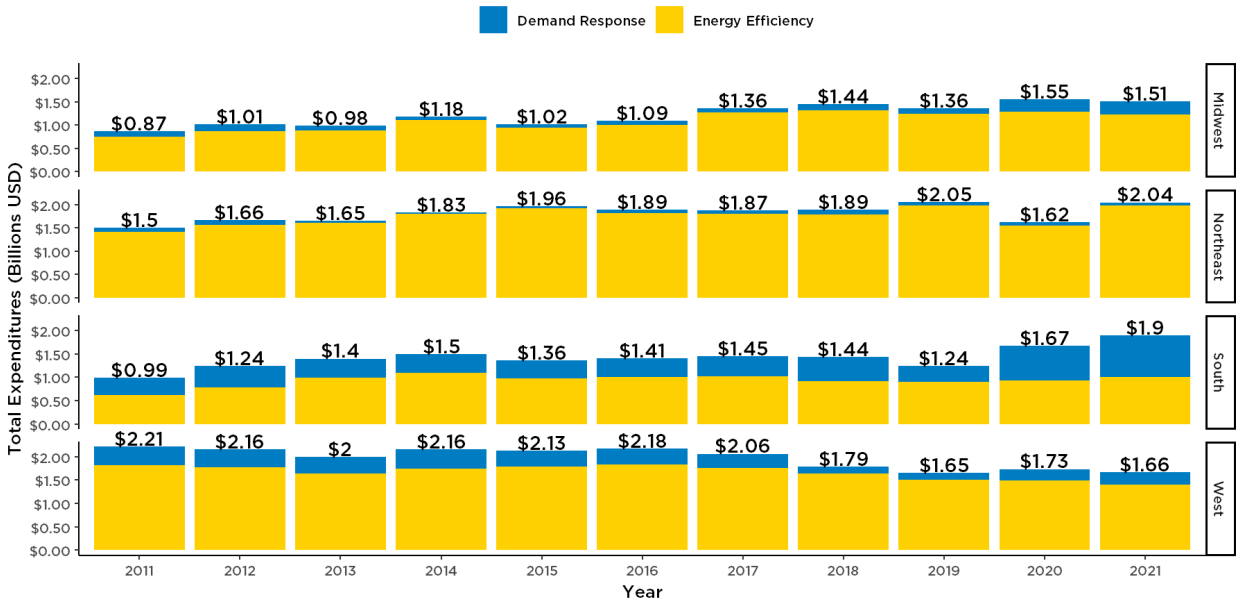
Figure 5. US Electric DSM Expenditures by Sector, 2010-2021



On the Canadian side, Canada program administrators spent $335 million USD in 2021.[5] Of note, Canadian low-income spending decreased by approximately nine percent. However, New Brunswick has committed spending on low-income communities starting next year.[6]

While overall US electric expenditures increased between 2020 and 2021, the story becomes more complicated when considered at the regional level. As shown in Figure 6, total DR expenditures in the Northeastern, Midwestern, and Western regions in 2021 were fairly consistent with 2020 numbers. We can observe that, in the Northeast, energy efficiency spending increases without much change in DR spending, and spending in the West has been decreasing, which may correspond to an increase in funding for distributed energy resources programs and other spending.

Figure 6. US Electric DSM Expenditures by Region and Type, 2011-2021



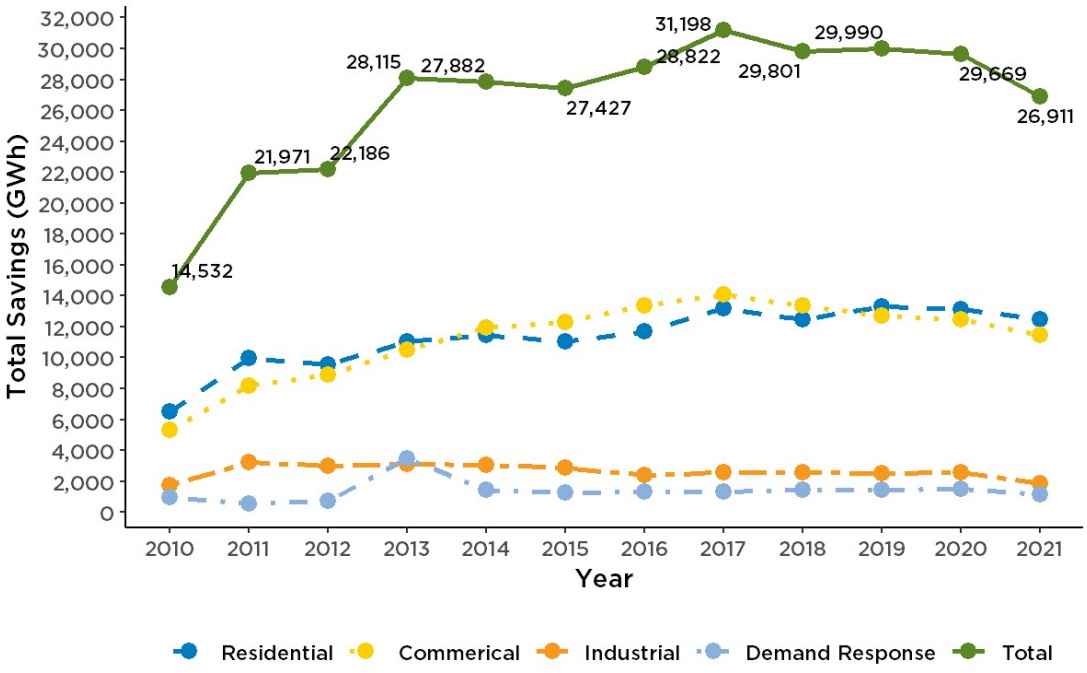
[5] This estimate does not fully capture spending on undifferentiated fuels. For a complete picture of Canadian spending over time, we refer readers to the Efficiency Canada scorecard, cited below. Because of jurisdictional reporting, the Efficiency Canada Scorecard allocates a substantial proportion of spending to undifferentiated fuels rather than to electric or gas spending specifically. As noted above, we were able to allocate relatively more of this undifferentiated spending to each fuel in 2021 than 2020, which may slightly inflate total North American numbers and we urge readers to consult Efficiency Canada's report for trends over time.

[6] Gaede, J., Nippard, A., Haley, B., Linders, A. 2022. The 2022 Canadian Energy Efficiency Scorecard: Provinces and Territories. Efficiency Canada, Carleton University, Ottawa, ON.

3.2 Where and How Much Energy was Saved in 2021

US and Canadian DSM programs have saved approximately 30,000 GWh (26,911 in the US and 2,964 in Canada), which is a slight decline from 2020 savings of 31,438 GWh (29,669 in the US and 1,739.4 in Canada). Despite increases in overall US program spending in 2021, US energy savings reported to the EIA decreased approximately nine percent from 29,669 to 26,911 GWh (Figure 7). This was offset by an increase in Canada, where net incremental energy savings totaled 2,584.3 GWh in 2022.

Figure 7. US Energy Saved (GWh) from DSM Programs by Sector, 2010-2021. Based on data from EIA



3.3 Grid and Renewable Infrastructure Trends

We continued exploring infrastructure and supply-side resources that support grid decarbonization and demand flexibility in this report. As shown in Figure 8 and Figure 9, the prevalence of advanced meters (AMR/AMI) has grown alongside the increase in solar and wind generation. These trends indicate both a greater capability and motivation to engage in DR programs and an increase in the value of the time and location of energy saved.

Figure 8. Total Intermittent Renewable Nameplate Generation in the United States by Region and Technology, 2013-2021

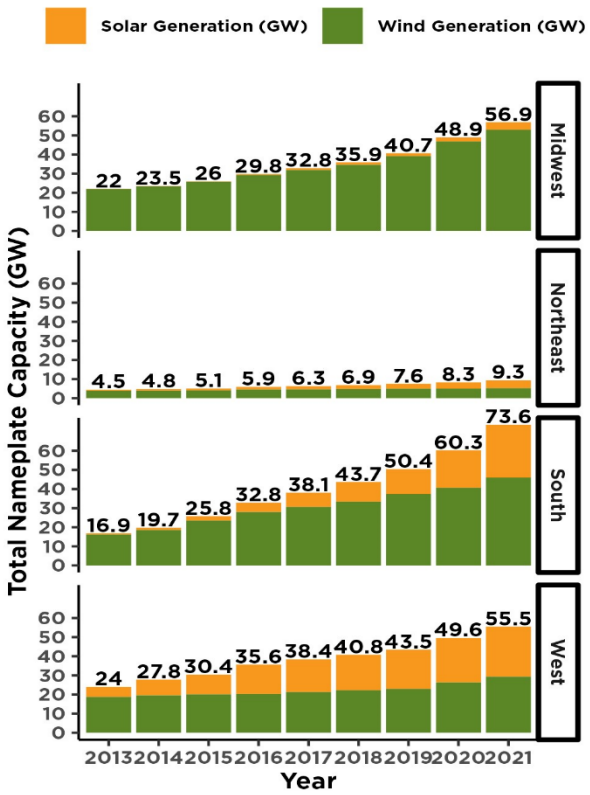
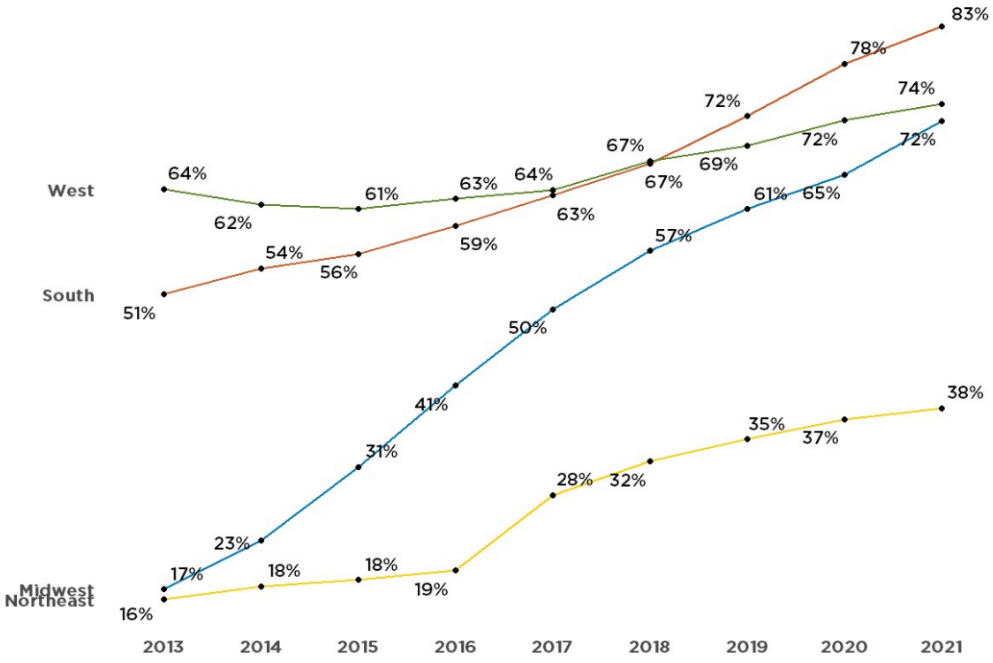


Figure 8. Proportion of all Electric Meters that are Advanced by Region, 2013-2021



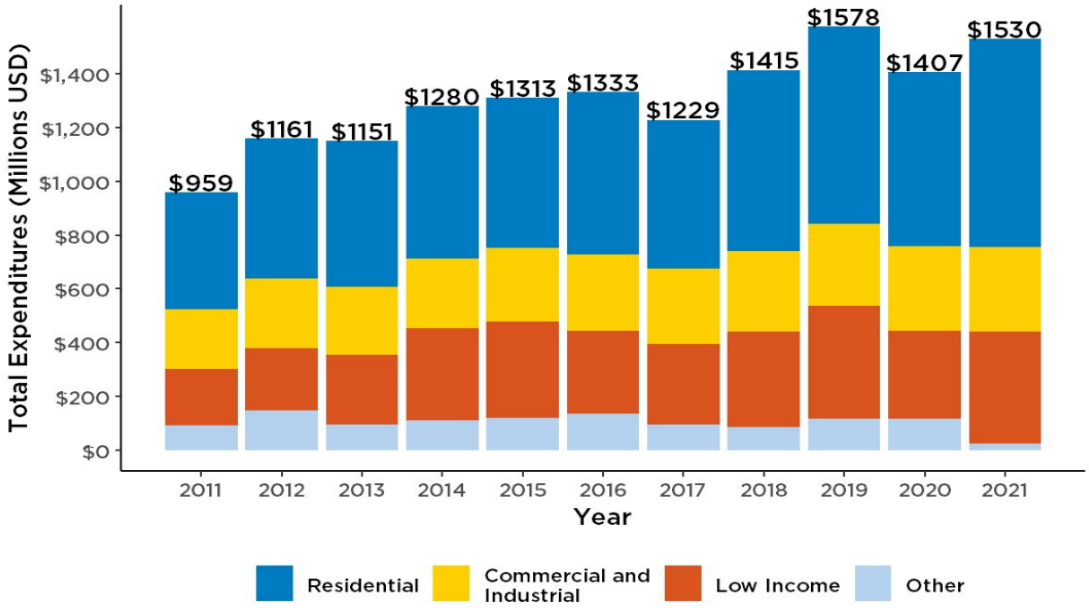
4 Changes in Natural Gas Savings and Expenditures

AGA collects data from US program administrators on spending, savings, and budgets for natural gas programs. As noted in the methodology section, 2021 data is incomplete, and industry results are extrapolated from a smaller-than-usual sample of respondents. We will update these values in next year's report if additional data can be collected. Canadian data comes from Efficiency Canada.

4.1 Spending on Natural Gas Programs in 2021

Spending on natural gas energy efficiency programs also increased. Total expenditures in the United States increased to about $1.5 billion from $1.4 billion in 2020, an approximate nine percent increase (Figure 9). This reflects a rebound in natural gas program spending following a decrease during the pandemic.

Figure 9. US Natural Gas Program Expenditures by Sector, 2011-2021



Note: 2021 Gas data is incomplete; 2020 n=74, 2021 n=45. In 2023, we anticipate AGA will retroactively update missing data for 2021.

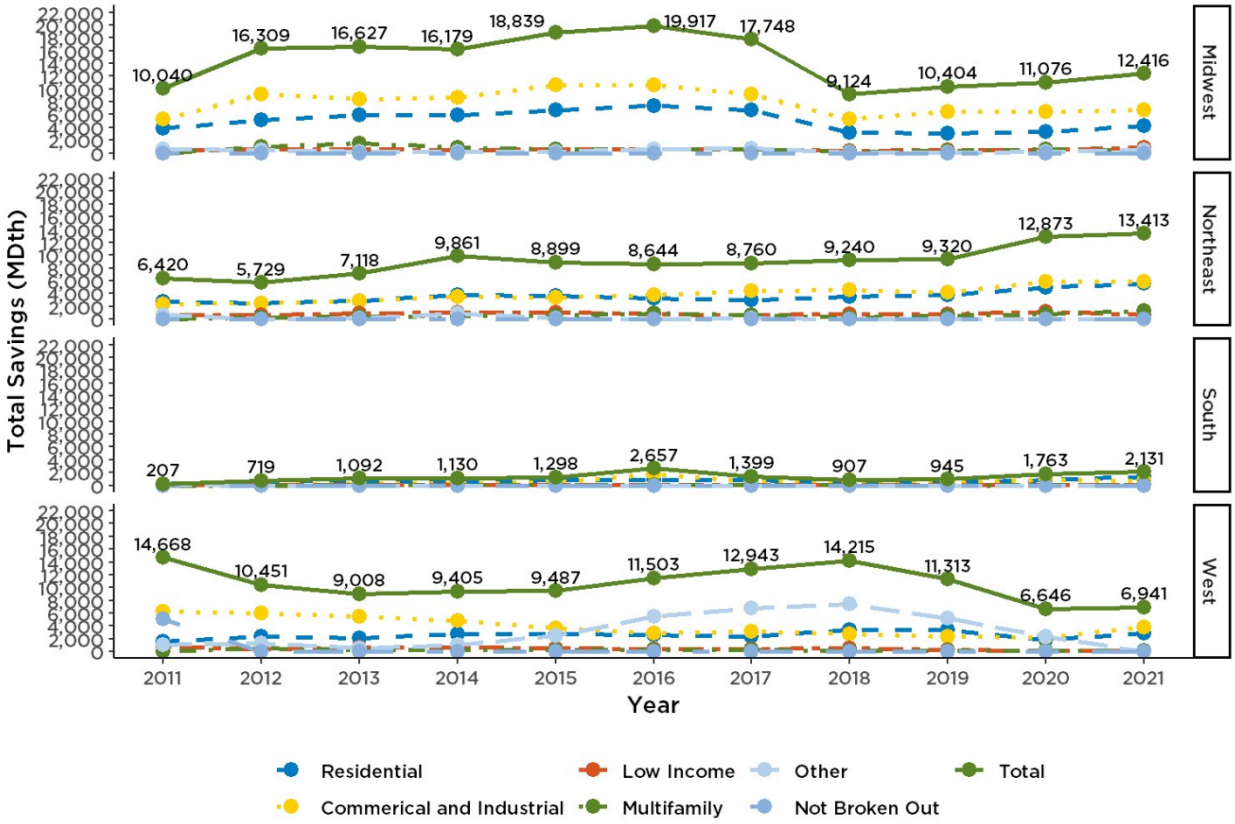
In Canada, natural gas spending was $210 million USD in 2021. As acknowledged above, this estimate does not include all of the multi-fuel spending reported by Efficiency Canada, which, if

fully included could increase natural gas expenditures to $379 million USD, and we refer readers to their report for a more complete synthesis of year-over-year Canadian spending trends. [7]

4.2 Where and How Much Natural Gas Was Saved in 2021

Natural gas programs saved approximately 349 million therms in the United States and 107 million therms in Canada over 2021. In the United States, the amount of energy saved by natural gas programs varied regionally, with the largest amount of savings coming from the Northeast and Midwest, where a larger proportion of households utilize natural gas as their primary heating fuel (see Figure 10).

Figure 10. Total US Energy Saved (MDth) by Region and Year, 2011-2021



Note: 2021 Gas data is incomplete; 2020 n=74, 2021 n=45. In 2023, we anticipate AGA will retroactively update missing data for 2021.

[7] Gaede, J., Nippard, A., Haley, B., Linders, A. 2022. The 2022 Canadian Energy Efficiency Scorecard: Provinces and Territories. Efficiency Canada, Carleton University, Ottawa, ON.

Appendix A Historical Comparison of Data Collection Methodology

As noted in the Introduction, this year we again relied on EIA 861 and data collected by the AGA and Efficiency Canada data rather than conducting primary data collection with members. This change was designed to reduce duplication of efforts and reporting burden for program administrators. To quantify the effects of the data collection methodology change on historical trends, we recalculated historical expenditures for 2011-2019 using the new 2021 methodology for 2020 EIA data.[8]

Results, displayed below, suggest that energy efficiency spending data from EIA is consistent across the old and new methodologies, but that the new methodology captures more DR spending.

Figure 11. **Total Electric DSM Expenditures from CEE's AIR and EIA Form 861 2011-2019**

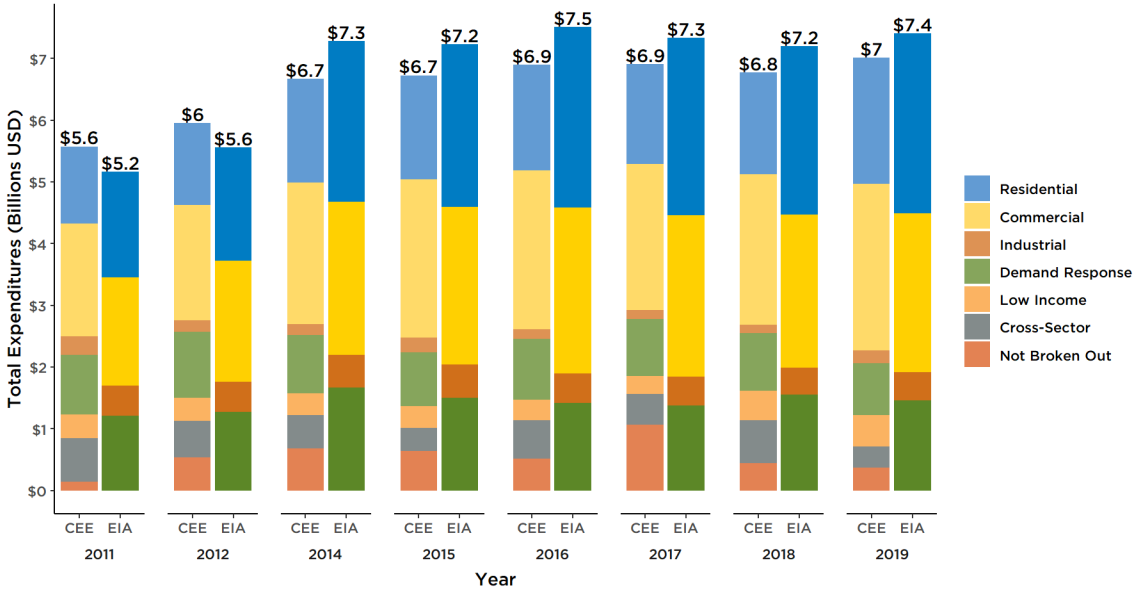


Figure 11 above plots the differences between CEE's primary survey results (as presented in previous reports) and data from EIA form 861, consistent with the new methodology. Overall expenditures are generally consistent across both methodologies year over year. There are some consistent differences in sector attribution, and this comparison highlights spending captured in EIA data that may not have been included in CEE's survey, specifically related to DRd.

[8] Data from the 2016 EIA Form 861 collection effort are available at "Electric power sales, revenue, and energy efficiency Form EIA-861 detailed data files," US Energy Information Administration, http://www.eia.gov/electricity/data/eia861/.

Figure 12. **Percent Difference Between EIA Expenditures and CEE's AIR Total Expenditures 2011-2019**

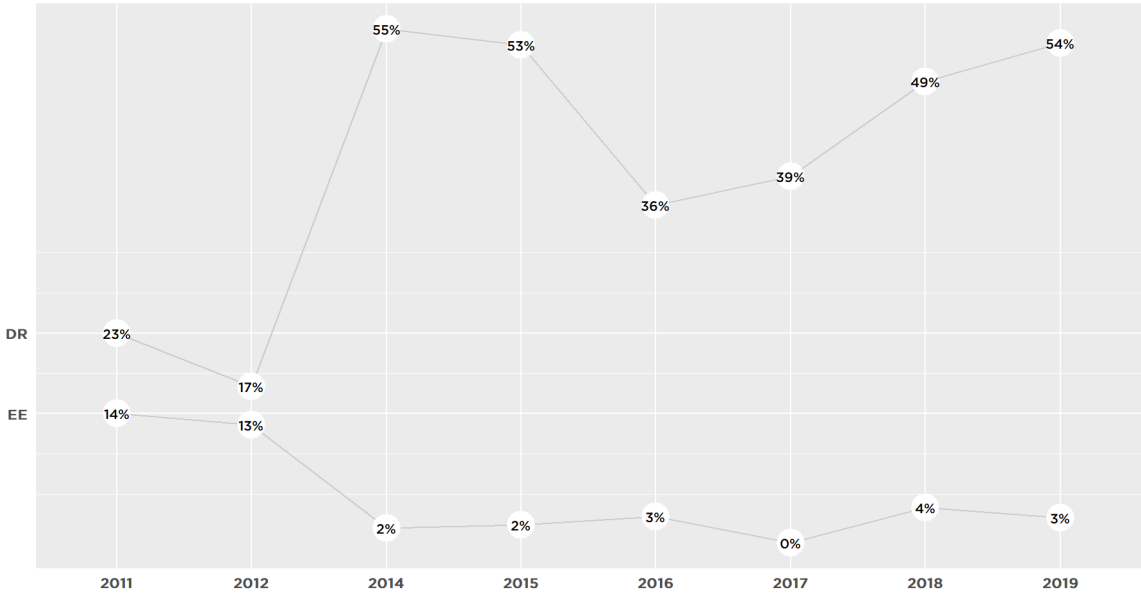


Figure 12 highlights the percent difference between EIA and Annual Industry Report expenditures over time, broken down by energy efficiency and DR. Starting from 2014, a year after EIA data separated DSM expenditures into energy efficiency (EE) and DR expenditures, there is less than five percent difference between data sources in tracking of EE expenditures, but the EIA accounted for more DR spending than CEE's primary survey efforts. In transitioning data collection methodology, energy efficiency data can be compared across years, and this year's Annual Industry Report supports a more complete account of total DR expenditures.