CEE Annual Industry Report

2015 State of the Efficiency Program Industry

BUDGETS, EXPENDITURES, AND IMPACTS

Consortium for Energy Efficiency

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PURPOSE AND LIMITATIONS

The purpose of this report is to provide an annual time series analysis, a point in time report, for the US and Canadian program industry on trends in energy efficiency and demand response budgets, expenditures, and savings. 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 budget, 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. First, this survey represents self-reported data by an individual or group of individuals within each responding organization. Although CEE and our collaborator, the American Gas Association, work closely with each responding organization to help respondents properly interpret survey questions and enter the correct information, the accuracy of the data is not verified outside of these efforts. Second, respondents provide data at different times during the data collection period from June to October, and not all program administrators report their information according to the calendar year. CEE and our collaborator have sought greater consistency in data collection from respondents over the years, however, the accuracy of the data are ultimately dependent upon 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 disimilarities, 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.

TERMS OF USE

ACKNOWLEDGEMENTS

CEE would like to thank the gas and electric energy efficiency and demand response program administrators in the United States and Canada that participated in this year's industry data collection. We appreciate the time and effort given by all survey respondents throughout the data collection process, including extensive clarification and follow-up. CEE is also grateful to members who have provided feedback and insights on this work over the years.

CEE appreciates our continuing collaboration with the American Gas Association (AGA), which provides natural gas industry data collected from their members for a similar research effort. CEE extends special thanks to Mariam Arnaout and Chris McGill of the American Gas Association for their coordination on survey development and the logistics of data collection.

This report was produced by Hilary Forster, Nicolas Dahlberg, Claire McIlvennie, and Craig Massey of the CEE Evaluation, Research, and Behavior Team. Assistance with outreach, data verification, and database programming was provided by Sophie Bermudez.

The correct citation for all years of Annual Industry Report data is as follows:

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

EXECUTIVE SUMMARY

This report concludes CEE's tenth consecutive data collection effort and annual report publication. The primary purpose of the survey and accompanying report is to capture industry budgets, expenditures, and impacts over time to enable assessment of overall industry trends. This year's report highlights 2015 budget data[1] and 2014 expenditure and impact[2] data compared to previously reported figures to assess industry growth and observe significant changes.

In 2015, the State of the Efficiency Program Industry Report continues to show growth and expansion of the efficiency program industry. Analysis of the data reported by US and Canadian program administrators supports the recent trend of increasing demand side management[3] (DSM) program expenditures. In 2014, combined spending on gas and electric DSM programs across the US and Canada totaled nearly $8.7 billion from all sources and $8.3 billion from ratepayers. This represents a nine percent increase over 2013 expenditures from all sources and a 34 percent increase over the last five years. CEE member programs accounted for almost $6.8 billion, or 78 percent, of these expenditures. US and Canadian DSM ratepayer-funded programs are estimated to have saved approximately 27,520 GWh of electricity and 459 million therms of gas in 2014, which represents 21.4 million metric tons of avoided CO_2 emissions[4].

Other key findings from this year's industry data collection include the following, listed in US dollars (USD):

Binational Trends: DSM Programs in the United States and Canada

- The 2015 report continues to indicate sustained growth in the industry, even when considering inflation and changes to the number of respondents.
- The 2014 expenditures reported increased by nine percent when compared to 2013, both for all 2015 respondents and only those

1 The budget data from survey respondents were collected during the summer and fall of 2015. This report does not capture changes made after that time.

2 "Impact data" refers to annually reported energy savings data commonly referred to as "ex ante" savings estimates. Ex ante savings are forecasted savings figures used for program and portfolio planning and reporting purposes. DSM program evaluators often review and revise ex ante savings during program or portfolio impact evaluation studies.

3 DSM programs encompass both energy efficiency (EE) and demand response (DR) funding.

4 Calculated using the EPA Greenhouse Gas Equivalencies Calculator., http://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator. February 2016.

respondents in the US and Canada that participated in both the 2014 and 2015 surveys.

- US and Canadian combined gas and electric DSM program budgets from ratepayer funds totaled over $9.1 billion out of the $9.4 billion budgeted from all sources. This represents a seven percent decrease from 2014 ratepayer funded budgets. Upon investigation, CEE concluded that the primary drivers of this decrease in planned spending stemmed from changes in exchange rates and significant changes to program plans and accompanying budgets for a few large program administrators in both the US and Canada.
- The largest sources of non-ratepayer funding budgeted for 2015 US electric DSM activity included the Regional Greenhouse Gas Initiative (1.69 percent of total budgets) and wholesale capacity market revenues (1.22 percent). US electric and US and Canadian gas program administrators also cited several miscellaneous sources;[5] Canadian gas program administrators reported 99 percent ratepayer funding.
- US and Canadian program administrators spent just over $1.042 billion from all sources—and just under $1.037 billion from ratepayers—on demand response programs in 2014, representing increases of two percent and three percent, respectively, as compared to 2013.
- Natural gas program expenditures in the United States and Canada rose between 2013 and 2014, to just over $1.4 billion from $1.3 billion.

Gas and Electric DSM in the United States

- US gas and electric DSM expenditures totaled $7.9 billion from all sources and about $7.6 billion from ratepayers in 2014, representing increases of inflation-adjusted expenditures of eleven percent and eight percent, respectively, as compared to 2013.
- US gas and electric DSM expenditures increased 28 percent since 2010 when adjusted for inflation.
- US DSM expenditures in 2014 represented about 0.05 percent of US GDP and 2.81 percent of value added[6] by the US utility industry.
- Ratepayer-funded programs resulted in 25,850 MWh gross incremental electric and 371 million therms of gas savings in 2014.

5 Miscellaneous sources of funding included state funding and shareholder funding.

6 The US Department of Commerce Bureau of Economic Analysis defines value added, or the GDP-by-industry as, "the contribution of a private industry or government sector to overall GDP… Value added equals the difference between an industry's gross output … and the cost of its intermediate inputs". US Department of Commerce Bureau of Economic Analysis. "Frequently Asked Questions: What is industry value added?" http://www.bea.gov/faq/index.cfm?faq_id=184. Accessed February 16, 2016.

Gas and Electric DSM in Canada

- Canadian gas and electric DSM program expenditures decreased to $748 million USD in 2014 ($826 million CAD[7]), which represents a nine percent (two percent) decrease over 2013 expenditures. Over the past five years, Canadian DSM expenditures have remained roughly consistent, around $800 million USD.
- Canadian DSM expenditures in 2014 represented 0.05 percent of Canadian GDP and two percent of value added by the Canadian utility industry.
- In 2013, ratepayer-funded DSM programs resulted in 1,670 MWh gross incremental electric savings and 87 million therms of gas savings.

This is the seventh consecutive year of collaboration with the American Gas Association (AGA). Working with AGA has streamlined data collection efforts and has helped increase participation and response rates for this survey. In 2015, data were obtained from 361 utility and nonutility program administrators[8] operating efficiency programs in all 50 US states, plus the District of Columbia, and eight Canadian provinces.

7 This report uses an average annual exchange rate of 0.9058 USD = 1 CAD for the 2014 expenditure and savings information and the 2015 average daily Federal Reserve exchange rate through June 12, 2015 of 0.8092 USD = 1 CAD for the 2015 budget information. See section 2.6 for a full explanation.

8 Survey respondents include electric and gas CEE members, program administrators who are members of AGA, large program administrators who are not members of either organization, and other program administrators identified through the EIA Form 861 DSM data, http://www.eia.gov/electricity/data/eia861/.

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FIGURES

1 Introduction

Over the past decade, CEE has collected data from demand side management (DSM) program administrators in the United States and Canada to provide insight to industry stakeholders regarding overall trends for the electric and natural gas efficiency program industry. In that time, the data have shown vibrant and stable growth in industry expenditures, and illustrated that each year energy efficiency and demand response programs provide a tangible source of energy savings. In the last five years alone, from 2010 to 2014, Canadian and US combined gas and electric DSM inflation-adjusted expenditures have increased 28 percent. Looking into the future, new national policies, such as the Clean Power Plan[9], are expected to improve the relative value of efficiency and may lead to continued growth of the energy efficiency program industry.

This report presents trends in 2014 program expenditures and savings and 2015 budgets reported by US and Canadian DSM program administrators, both electric and natural gas. A total of 361 utility and nonutility program administrators operating efficiency programs in all 50 US states, the District of Columbia, and eight Canadian provinces responded to this year's survey.[10] While this effort constitutes one of the largest and most comprehensive surveys of program administrators in the United States and Canada, and extensive ongoing attention is devoted to data standardization, CEE cautions against making representations and comparisons beyond those provided in this report. As previously indicated in the Purpose and Limitations and in the

9 The Clean Power Plan seeks to reduce carbon dioxide emissions from existing power plants under the Clean Air Act section 111(d). The Clean Power Plan promotes energy efficiency as a demonstrated, cost-effective method states can incorporate into their implementation plans to meet carbon emission reduction targets. US Environmental Protection Agency. "FACT SHEET: Energy Efficiency in the Clean Power Plan." http://www.epa.gov/cleanpowerplan/fact-sheet-energy-efficiency-clean-power-plan Accessed February 7, 2016.

10 CEE improved the way we track and define response rates starting with the 2014 report. See section 2.1 for more details on this change.

Terms of Use, limitations to the comparability and consistency of the data reduce their analytical usefulness below the state or sometimes the regional level. Section 2 clarifies these limitations and outlines the reasons why use of this information at any level—state, regional, national, or binational—should not extend beyond the intended purpose stated above.

1.1 Report Structure

The 2015 State of the Efficiency Program Industry report is divided into eight sections.

This section, included under the heading of Introduction, provides an overview of the report's scope, key assumptions, and structure.

Section 2, Data Collection and Limitations, describes the report's methodology and includes detailed information on data collection methods, survey response rates, and the limitations of the data presented in this report.

Section 3 Demand Side Management Program Funding in the United States and Canada, presents regional and national data and analysis of natural gas and electric DSM programs.

Section 4 Evaluation, Measurement and Verification, presents analysis of program expenditures in these areas.

Section 5 Estimated Program Savings and Environmental Impacts, provides estimated national energy savings data from energy efficiency programs in the United States and Canada. These data are reported by country, fuel type, and customer class.

Appendix A Electric Energy Efficiency Program Categories provides a list of the electric energy efficiency program categories used in the 2015 survey and discussed throughout the report.

Appendix B List of US and Canadian Electric Energy Efficiency Program Category Expenditures contains tables with electric energy efficiency expenditures by program type for each country, grouped by program category, which are discussed in section 3 of the report.

Appendix C Electric Demand Response Program Expenditures contains additional figures regarding electric demand response expenditures in the United States by program type. These figures also expand upon information in section 3.

Additional data tables that accompany this report present energy efficiency and demand response program expenditures and budgets by state and province.[11] These tables also present energy savings aggregated and reported at the regional level for the United States and the national level for Canada. CEE does not report savings data by state or province due to the risk of misinterpreting program cost-effectiveness, and because of limitations associated with comparing program savings data, which are further explained in section 2 of this report.

For more information on this report, or to obtain the Annual Industry Report brochure or graphics produced for this report, please visit cee1.org. For members, the report is posted in the CEE Forum.

2 Data Collection and Limitations

This section provides context regarding data collection efforts, in particular participant response rates, program funding, reporting periods, program categories, and exchange rate information. This section also states the limitations of the data required to properly interpret the results of this report.

CEE collected data during the summer and fall of 2015, in conjunction with the American Gas Association (AGA).[12,13] CEE collected all electric program data, while CEE and AGA collaborated to collect gas program data, with AGA collecting the majority of the information. CEE only collected natural gas efficiency information from organizations that are not AGA members, including statewide program administrators. Collaboration with AGA has streamlined data collection and expanded the sample pool of program administrators over the years, and AGA is a major contributor to this report. AGA also publishes additional information on natural gas DSM programs, including a summary of budgets and expenditures as reported here, energy savings data, information on program implementation and evaluation, and

11 These tables are available at http://www.cee1.org/annual-industry-reports.

12 The American Gas Association, founded in 1918, represents more than 200 local energy companies that deliver clean natural gas throughout the United States. There are more than 71 million residential, commercial, and industrial natural gas customers in the US, of which 94 percent—over 68 million customers—receive their gas from AGA members. AGA is an advocate for natural gas utility companies and their customers and provides a broad range of programs and services for member natural gas utilities, pipelines, marketers, gatherers, international natural gas companies, and industry associates. Today natural gas meets more than one-fourth of the United States' energy needs. To find out more, please visit www.aga.org.

13 CEE began collaborating with AGA in 2009 to increase the report's coverage of natural gas programs.

regulatory information. Please contact AGA directly for more on these publications, which are available on their website.

CEE administers this survey annually via an online survey[14] to a variety of DSM program administrators, including investor-owned utilities, nonutility program administrators, municipal power providers, and co-ops. The survey frame included previous survey respondents, all member organizations of AGA and CEE,[15] nonmembers who were expected to have significant DSM programs, and some program administrators who submitted data to the Energy Information Administration (EIA).[16] Due to the constantly changing nature of the DSM industry, it is difficult to identify and survey every program administrator. Despite this challenge, CEE has continuously worked to make its sample frame as representative of the current industry as possible.

2.1 Response Rates

Data for this report come from a voluntary survey administered to program administrators in the United States and Canada. Because responding organizations may vary by state or province from year to year, caution should be used in comparing data and inferring trends, especially at the state or provincial level. Despite numerous attempts to follow up, not all organizations included in the sample frame respond to the survey each year. Thus, year to year changes in the data reported here cannot be entirely attributed to new or expanded programs and new program administrators. Where appropriate, the analyses below include comparisons of only those respondents who provided information in both 2014 and 2015, alongside the analyses of all data collected.

In 2013, CEE began asking respondents to provide public regulatory documents, program plans, and implementation or evaluation documents in the survey. This has allowed us to verify information provided by survey respondents and, in some cases, to update inaccurate information or to supplement what we received with public data not provided in the survey. Most importantly, these supplemental documents have allowed CEE to uncover

14 The electric survey collects information about demand response programs, but the natural gas survey does not because comparable demand response programs do not exist for natural gas.

15 CEE members include electric and natural gas efficiency program administrators from across the United States and Canada. For more information on CEE membership, please visit www.cee1.org/content/members.

16 There are many community-owned electric utilities operating efficiency programs in the United States that are not included in this report. The American Public Power Association (APPA) is a nonprofit organization created to serve the nation's more than 2,000 community-owned electric utilities that collectively deliver power to more than 48 million Americans. For more information about APPA or its members, please visit www.publicpower.org.

unreported information for program administrators who we expected to have significant DSM budgets, expenditures, or savings. In a handful of cases, CEE supplemented partial responses to the survey with data from the Energy Information Administration (EIA)[17] or, for a couple large Canadian program administrators, carried over information from the previous year (adjusting for exchange rates and inflation, as appropriate) to estimate program activity rather than allow totals for these administrators to fall to zero.

In 2015, this report reflects data obtained from 361 utility and nonutility program administrators operating DSM programs in all 50 US states, the District of Columbia, and eight Canadian provinces. In total, this 2015 report describes budget, expenditure, and impact information for 14 more respondents than in 2014. Only a few known large DSM program administrators did not provide any data to CEE or AGA this year, and in most cases, CEE was able to find supplemental public information, project based on past trends, or, in very few cases, carry through previous years' totals to develop a "straight line" estimate. As in the past, CEE concludes that this report represents the vast majority of large efficiency program administrators and that the data provided below sufficiently represent the DSM industry in 2014 and 2015.

2.2 Funding Sources

In previous survey years, CEE asked respondents to provide budget and expenditure figures from ratepayer funded sources, as well as to list other sources of funding in the survey. Respondents often listed other sources, such as the American Recovery and Reinvestment Act (ARRA), without providing any supporting data figures to indicate the significance of the additional funding. In 2013, CEE began asking electric survey respondents to report budget and expenditure figures using defined categories that included both ratepayer and non-ratepayer sources. In 2014, CEE and AGA also began asking gas survey respondents to report additional funding from non-ratepayer sources.[18] These changes were intended to improve the consistency and clarity of survey terminology and reporting categories, as well as to obtain a more comprehensive picture of the industry's financial landscape and identify the relative magnitude of funding from sources other than ratepayers.

17 Data from the 2014 EIA Form 861 collection effort are available http://www.eia.gov/electricity/data/eia861/.

18 Only natural gas program expenditures and savings derived from ratepayer dollars are identified in this report. In all, gas program administrators reported that 99.2 percent of expenditures in 2014 were made using ratepayer funding. One hundred percent of natural gas savings reported to CEE and AGA were presumably derived from ratepayer funding. section 3.2 below addresses non-ratepayer sources of funding in 2015 budgets.

CEE defines ratepayer funds as dollars secured through special regulator-approved benefit or on-bill tariff charges that are universally collected as supplemental charges to energy bills.[19] CEE defines non-ratepayer funds as funds received from sources such as wholesale capacity market revenues, Regional Greenhouse Gas Initiative (RGGI) proceeds, and dollars allocated to weatherization assistance programs. CEE no longer asks respondents to report funds dispersed from the American Recovery and Reinvestment Act (ARRA), as no ARRA funds were reported in 2014, and we do not believe any significant sources of these funds exist at this point.

In this report, we disclose total figures that represent all funding sources in charts and graphs depicting historical trends. Where appropriate, the text specifically notes the percentage of 2015 budgets and 2014 expenditures and savings attributable only to ratepayer funds.

2.3 Reporting Period

CEE asked respondents to provide data representing total program budgets for 2015 and total program expenditures and savings for 2014 that aligned with calendar years. CEE defined the budget year for this survey effort as beginning on January 1, 2015 and ending on December 31, 2015. Similarly, CEE defined the expenditure and savings year for this survey effort as beginning on January 1, 2014 and ending on December 31, 2014.

In some cases, respondents indicated that their organizational reporting cycles did not align with calendar years and that figures reported were not adjusted accordingly. In these cases, CEE requested supplemental information regarding the specific start date and end date for annual budget figures and annual expenditures figures. CEE did not adjust their reported annual figures to align with the calendar year reporting cycle, however. Therefore, please note that some portion of the 2015 industry budget figures and some portion of the 2014 expenditures and savings figures may include data that fall outside of the January 1 to December 31 reporting cycle. Any year identified in this report should be taken to mean the associated program year for all program administrators.

19 More specifically, CEE clarified in the 2015 survey that ratepayer funds include "funds derived from system benefit charges, bill surcharges, utility revenues, budget carryover, and transfers from other program administrators that derive funds from any of the above."

2.4 Reporting Categories

This publication groups data into customer classes, as in previous years. Electric customer classes in 2015 include residential, low income where separable from residential, commercial, industrial, C&I where commercial and industrial were not separately reported or distinguishable, cross sector, and demand response. Since 2013, the category of EM&V used in previous reports is included as part of cross sector, which covers activities that span multiple customer classes. Customer classes in the gas data include residential, low income where separable from residential, multifamily where separable from residential and commercial, industrial, C&I where commercial and industrial were not separately reported or distinguishable, and other.

In 2013, CEE introduced more granular categories within each electric customer class. The categories used in 2013 were adapted with a few minor changes from a typology developed through another national research effort.[20] As a result, CEE has incorporated questions into the survey that ask respondents to report budgets, expenditures, and impact data by program type, if possible.[21] In 2015, as in 2014, CEE also allowed respondents to provide rough percentage breakdowns of their budgets, expenditures, and impacts by program category, even if they could not provide exact dollar or MWh figures for programs. These changes aim to provide more specific information regarding the types of electric programs administered in the US and Canada and allows for a more nuanced understanding of program offerings moving forward. See Appendix A for a list of the program categories used in 2015, which are consistent with the categories used in the previous two years.

As in past years, CEE based demand response program categories on those specified and defined by the US Federal Energy Regulatory Commission (FERC).[22] FERC defines several demand response program types and groups them into two major categories described in general terms as follows:

20 Hoffman, Ian M., et al. "Energy Efficiency Program Typology and Data Metrics: Enabling Multi-state Analyses Through the Use of Common Terminology." Lawrence Berkeley National Laboratory. http://emp.lbl.gov/sites/all/files/lbnl-6370e.pdf. August 2013.

21 CEE has incorporated program level questions for the electric survey only. CEE will continue work with our members and with AGA in the future to determine whether this approach is feasible for the gas program administrators surveyed.

22 CEE sourced demand response terminology from the "2012 Assessment of Demand Response and Advanced Metering: Staff Report," Federal Energy Regulatory Commission, https://www.ferc.gov/legal/staff-reports/12-20-12-demand-response.pdf December, 2012.

- Incentive programs that address load control through a contractual agreement with the customer, usually offering rebates, rate discounts, or bill credits and possibly penalties for noncompliance.
- Time based programs that invite customers to participate. When the utility needs to reduce load during system peaks, it sends opt-in notifications and offers incentives such as graduated pricing schemes in exchange.

Highlights of collected program data are presented in the appropriate sections below, but these data only represent respondents who chose, or were able, to provide information broken out into the specified program categories. The survey asked respondents who could not report at this level of granularity to break their budgets, expenditures, and savings into customer classes only.

The "not broken out" category includes respondent data not further divided into customer classes. These data appear in the binational and national aggregated totals and charts in this report but, by definition, are not included in the analysis of data by customer classes or program types.

2.5 Other Data Limitations

CEE makes every attempt to collect data that align with the definitions and data requirements outlined in the terminology section of the survey. When staff identifies outlying values in the data, we contact respondents and work with them to obtain accurate information. Furthermore, we believe that improvements resulting from the switch to an online survey format have reduced errors over the past few years.

With regard to budgets, considerable room exists for reporting error, and such errors are not always apparent. "Cycle budgets" provide a prime example and are discussed in more detail in section 3.3. Annual budgets in this report also present limitations, as they illustrate a snapshot from within the data collection period, whereas expenditures and savings from the previous year have often been finalized by the time the survey is fielded.

The data in this publication do not reflect changes to program budgets after the fall of 2015, such as those due to newly approved programs or budget cuts. In addition, carryover of unspent funds from 2014 could result in double counting. In light of the caveats outlined above surrounding annual budgets, this report follows previous years and focuses on expenditures rather than budgets as the best indicator of energy efficiency program industry investment.

Finally, several issues limit the comparability of the data—in particular the savings data—across the United States and Canada. These include, but are not

limited to, variations in regulatory requirements or program administrator practices for reporting performance data; differences in the interpretation of the terms used in the survey even when standard definitions are provided; differences in accounting practices among program administrators; variations in formulas used to estimate gross and net program savings; and differences in the focus or goals of programs, which often affect the tracking and reporting of different performance data.

Each regulatory jurisdiction provides specific policies for program administrators in that jurisdiction, which can lead to different assumptions and methods for cost-benefit tests, net-to-gross factors, savings equations, avoided transmission and distribution system line losses, measure persistence, and incremental savings reporting between states and provinces. For example, some program administrators may only account for incremental savings resulting from installation of efficient equipment using existing codes as a baseline, whereas others are allowed to account for savings using the efficiency of the replaced equipment as a baseline. These different baseline assumptions may lead to significant variations in the savings claimed by different program administrators for the same efficient equipment in the same replacement scenario. CEE believes that for these reasons, savings data in particular should only be aggregated at the US census region level in the United States and at the national level in Canada.

2.6 Currency Conversions and Corrections for Inflation

For ease of reading, all currency is reported in nominal US dollars (USD) unless otherwise specified. Where used, Canadian dollars (CAD) are also nominal unless otherwise specified. Real US dollars were calculated using the Bureau of Labor Statistics CPI Inflation Calculator,[23] and real Canadian dollars were calculated using the Bank of Canada CPI Inflation Calculator.[24] This report uses an average annual exchange rate of 0.9058 USD = 1 CAD for the 2014 expenditure and savings information (an average of the daily Bloomberg Exchange Rate for January 1, 2014 to June 30, 2014 and the daily Federal Reserve[25] exchange rate for July 1, 2014 to December 31, 2014) and the 2015 average daily Federal Reserve exchange rate through June 12, 2015 of 0.8092 USD = 1 CAD for the 2015 budget information.

23 "Bureau of Labor Statistics CPI Inflation Calculator." http://www.bls.gov/data/inflation_calculator.htm. Accessed February 7, 2016

24 "Bank of Canada Inflation Calculator." http://www.bankofcanada.ca/rates/related/inflation-calculator/. Accessed February 7, 2016

25 "Canada—Spot Exchange Rate, Canadian $/US$." http://www.federalreserve.gov/releases/h10/Hist/. Last updated February 1, 2016

2.7 Corrections to 2014 Data

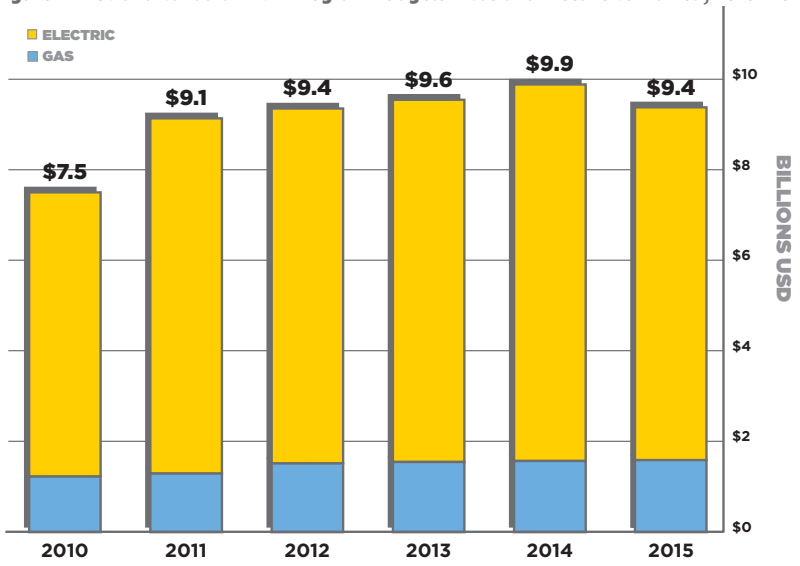
Please note that the 2014 budgets and 2013 expenditures and savings appearing in this report and associated data tables have been adjusted from last year's report where respondents subsequently corrected their 2014 survey responses.

3 Demand Side Management Program Funding in the United States and Canada

3.1 Combined DSM Budgets in the United States and Canada

US and Canadian electric and gas DSM program budgets— including both energy efficiency and demand response programs from all surveyed sources—reached nearly $9.4 billion in 2015, representing a five percent decrease from 2014 (Figure 1).[26] Data analysis revealed that this decrease is primarily attributable to a few large electric program administrators who reported significant decreases in either energy efficiency or demand response program budgets.

Figure 1 US and Canadian DSM Program Budgets—Gas and Electric Combined, 2010–2015



Budgets derived exclusively from ratepayer funds accounted for 97 percent, over $9.1 billion, of the total 2015 budget figure. Figure 1 does not isolate demand response budgets, though in 2015, they represented just under

26 Percentage changes in combined US and Canadian data are not adjusted for inflation. Data are adjusted for inflation for each individual country, however, and are identified throughout the report.

10 percent of both the total DSM budgets from all sources, about $910 million, and the ratepayer funded DSM budgets, about $881 million. Since 2012, the percentage of both the total and ratepayer funded DSM budget figures allocated to demand response programs has steadily decreased, from 14 percent in 2012 to 10 percent in 2015.

3.2 Funding Sources

In 2015, ratepayer dollars constituted 96.42 percent of funding for electric DSM programs in the United States. Remaining sources of funding included the Regional Greenhouse Gas Initiative (1.69 percent) and wholesale capacity markets (1.22 percent), in addition to unidentified sources (0.66 percent). No funding was reported as being derived from the American Recovery and Reinvestment Act. Regional Greenhouse Gas Initiative (RGGI) funding constituted seven percent of the total funding reported in the RGGI states, as compared to three percent of funding for these states in 2014.

In 2015, ratepayer dollars constituted 99.2 percent of funding for natural gas energy efficiency programs in the United States. The remaining 0.8 percent was derived from various other sources, most notably state funding, shareholder funding, and RGGI. These other sources are not separately distinguishable.

In 2015, 92.67 percent of Canadian funding for electric DSM programs came from ratepayer funding. Other sources of funding were not separately distinguished by survey respondents. All Canadian natural gas program administrators reported that 99 percent of their 2015 DSM budgets were derived from ratepayer dollars.

3.3 Continued Program Funding

Since 2013, CEE has asked program administrators to report multiyear budgets, referred to in the survey and this report as “cycle budgets,” that provide a glimpse into funding that has been set aside for DSM programs over the next several years. This is primarily a quality assurance procedure in that it allows CEE to verify that budgets for individual program years are not arbitrarily over reported and to estimate single year budgets when program administrators do not allocate funds on an annual basis. In addition, because DSM activity may ramp up at the beginning of a cycle and down at the end of a cycle, this information explains—and anticipates—certain trends.

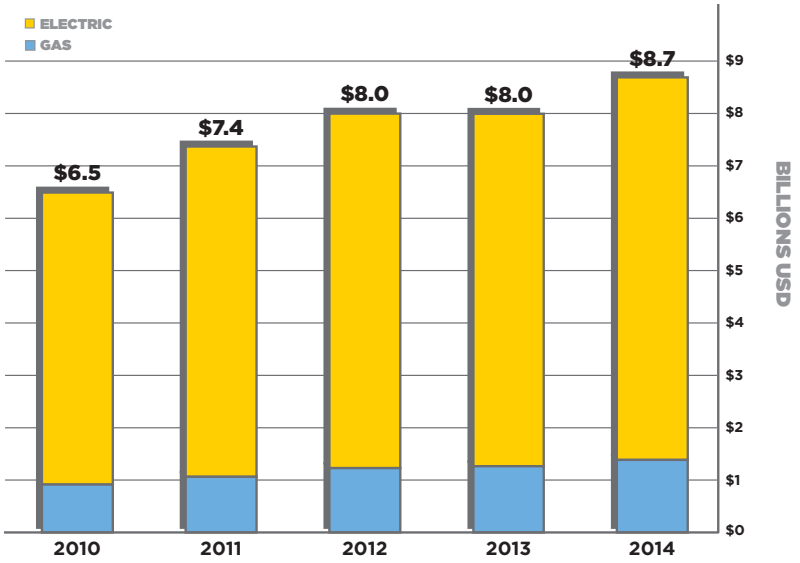
Roughly 29 percent of cycle budgets reported in this year’s survey extend past the end of 2015—12 percent will end in 2016, nine percent in 2017, and

eight percent in 2018 or after. Well over half, or 71 percent, of the cycle budgets reported were for only one year or, if they were for multiple years, simply ended in 2015. Although procurement plans for supply-side energy resources may extend several decades into the future, this signifies that multiyear planning is also integral to DSM activity. Furthermore, in some areas DSM is already anticipated in resource plans spanning a decade or more.

3.4 Combined DSM Expenditures in the United States and Canada

DSM expenditures of American and Canadian program administrators who participated in this year's survey totaled $8.7 billion in 2014, with $8.3 billion in expenditures from ratepayer funds, a nine percent and six percent increase over 2013, respectively. The nominal difference between 2013 and 2014 is slightly greater, with total DSM expenditures increasing 11 percent from all sources and nine percent from ratepayer funded programs when taking inflation into account. Figure 2 illustrates the historic trend of US and Canadian combined DSM expenditures over the years.

Figure 2 US and Canadian DSM Program Expenditures—Gas and Electric Combined, 2010–2014



Although not isolated in Figure 2, demand response expenditures represent 12 percent of total expenditures in 2014 regardless of funding source. This is slightly less than the proportion of total DSM expenditures spent on demand response in the previous three years, when demand response accounted for between 13 and 14 percent of total DSM program expenditures. This decrease in the proportion of DSM expenditures spent on demand response in recent years is consistent with a similar trend for demand response budgets.

CEE has previously noted that increases in the number of survey respondents year after year could explain some of the historical growth in budgets, expenditures, and savings.[27] As explained in section 2.1, despite our best efforts, Figure 2 does not depict expenditures year after year from the exact same pool of survey respondents.[28] This survey received 14 additional responses compared to 2014, although this response rate is consistent with that from 2013. When strictly comparing survey respondents in the US and Canada who participated in both the 2014 and 2015 surveys, expenditures increased nine percent in 2014, which is consistent to the percentage increase in expenditures when comparing the entire survey pool for each year.[29] While reported DSM budgets decreased slightly in 2015, these comparisons indicate growing expenditures in the energy efficiency program industry beyond the effects of drop-offs or new respondents between the 2014 and 2015 survey years.

3.5 United States DSM Trends

US administrators spent over $7.9 billion[30] from all sources for gas and electric DSM programs in 2014. This total includes both energy efficiency and demand response (Figure 3).

These expenditures increased 11 percent over 2013 DSM expenditures in the US, both in nominal dollars and when adjusted for inflation. When considering the past five years, US inflation-adjusted DSM expenditures have increased 28 percent. Comparing just those program administrators who responded to both the 2014 and 2015 surveys, expenditures from all sources increased by nearly $752 million, or 11 percent.

The $7.9 billion spent by US DSM program administrators represent about 0.05 percent of 2014 US gross domestic product and 2.81 percent of the value

27 Please note that as the CEE survey panel now contains most large program administrators in the US and Canada, and CEE believes that since 2012, the panel of survey respondents targeted each year for data is representative of DSM industry at large. Therefore, CEE believes that increases due to new respondents are no longer expected to have a large impact. However, the effects of a "large" respondent not participating in subsequent years could potentially cause notable variation.

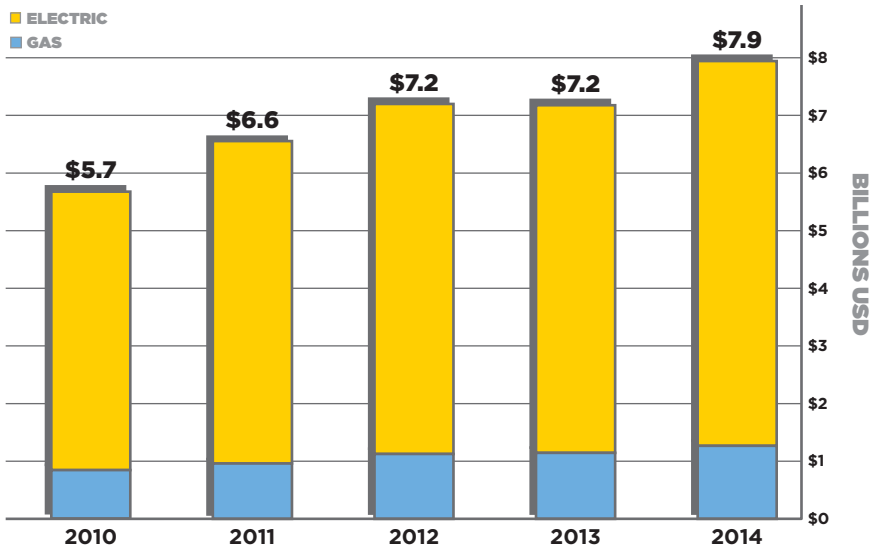
28 As stated in Section 2.1, where appropriate, CEE will provide supplemental analyses that include comparisons of only those respondents who provided information in both 2014 and 2015, alongside the analyses of all data collected, because responding organizations may vary from year to year. Thus, the year to year changes in the historical trend graphs cannot be entirely attributed to new or expanded programs and to new program administrators.

29 Survey respondents that provided both 2013 and 2014 expenditure data spent $678 million more on DSM programs in 2013 than in 2014.

30 $7.6 billion of these expenditures were derived solely from ratepayers, an eight percent increase over 2013 in both nominal dollars and when adjusted for inflation.

added by the US utility industry to the gross domestic product in 2014. DSM expenditures were closest in scope to the value added by the "apparel and leather and allied products" industry ($10.8 billion in 2014 dollars[31]).

Figure 3 US DSM Expenditures—Gas and Electric Combined, 2010–2014



Although not depicted in Figure 3, in 2015, natural gas and electric DSM program administrators in the United States budgeted nearly $8.6 billion from all sources, representing a four percent decrease as compared to 2014 when adjusted for inflation.

3.5.1 United States Electric DSM Trends

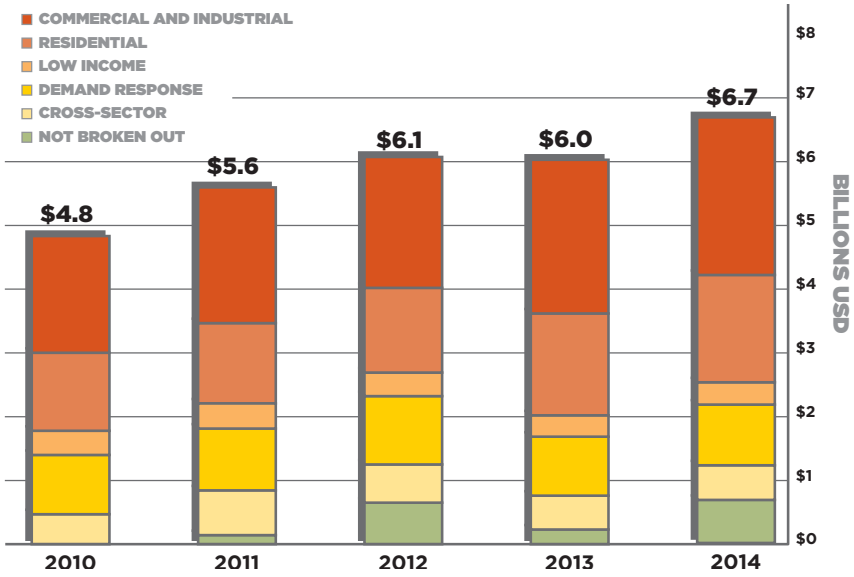
In 2014, US program administrators spent almost $6.7 billion on electric DSM programs, representing an 11 percent increase from 2013 expenditures, or a nine percent increase when adjusting for inflation.[32] Figure 4 below presents the breakdown of US electric expenditures from 2010 to 2014 by customer class, which, from 2012 onward represents the sum of either program level data rolled up to customer classes or customer class data provided directly by respondents. "Not broken out"[33] contains data that program administrators could not allocate to a specific program or customer class.

31 Comparisons in this paragraph are based on data from the US Department of Commerce Bureau of Economic Analysis: http://www.bea.gov. Latest release date: November 15, 2015.

32 In 2014, $6.3 billion of the total expenditures were derived solely from ratepayer funds. This represents a slight decrease compared to the proportion of expenditures from ratepayers in 2013 of three percent when adjusted for inflation. In 2013, 97.3 percent of expenditures came from ratepayer funds, and in 2014 94.3 percent of expenditures were derived from ratepayer funds.

33 Please note that the "not broken out" class was added in 2011 to capture any expenditure figures that could not be allocated to individual customer classes, which in some cases includes overall portfolio activities such as EM&V or administration and marketing.

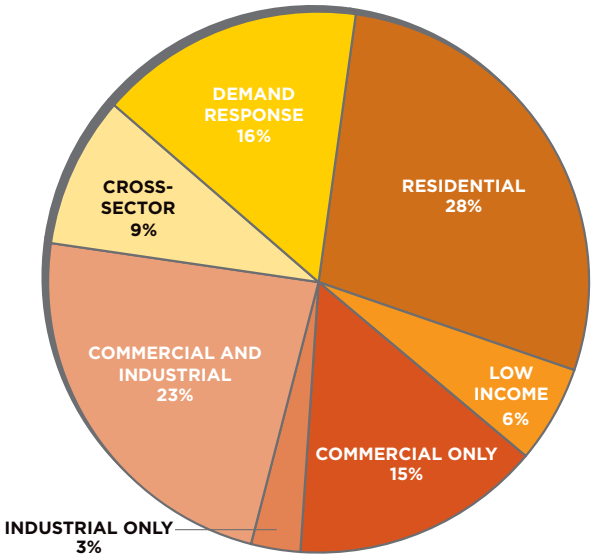
Figure 4 US Electric DSM Expenditures, 2010–2014



Notably in 2014, the proportion of DSM electric expenditures appropriated to the "not broken out" category rose significantly as compared to 2013, with total spending in the category increasing by almost 300 percent. Contributing to this increase are responses from several large program administrators that provided a breakdown of spending in 2013 but not 2014. With spending in the remaining categories increasing moderately, three to seven percent, or remaining relatively stable from the previous year, the overall increase in US electric expenditures seen in 2014 is primarily driven by expenditures classified as "not broken out."

Figure 5 provides a more granular breakdown of 2014 US electric expenditures from all sources by customer class, with the not broken out class removed and with commercial and industrial separated into commercial, industrial, and C&I classes. Continuing the trend from previous years, the data illustrate that commercial and industrial efficiency programs received the largest share of electric program funding in the US, comprising 41 percent of 2014 US electric DSM expenditures across the three respective categories. The residential sector received the second largest share of 2014 DSM electric expenditures, 28 percent. Demand response also maintained a sizable portion of expenditures at 16 percent, followed by cross sector, nine percent, and low income programs, six percent.

Figure 5 US Electric DSM Expenditures by Customer Class, 2014



CEE also collected information on expenditure (cost) categories for electric energy efficiency programs, as depicted in Figure 6.

Figure 6 US Electric Energy Efficiency Expenditures by Category, 2014

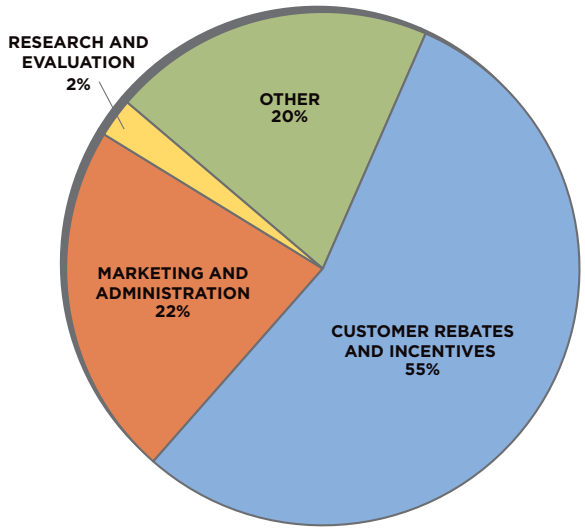


Figure 6 provides an overview of how US program administrators currently allocate electric energy efficiency program expenses, regardless of the targeted customer class. As in 2012 and 2013, customer rebate and incentive costs, sometimes classified as direct program costs, represented over half of US electric energy efficiency expenditures in 2014. Marketing and administration costs, often referred to as indirect program costs, represented 22 percent of 2014 energy efficiency program expenditures in the United States, a slightly higher proportion than in 2013. The “other” category, making

up 20 percent of 2014 US electric expenditures, contains all funds that US program administrators could not separate into one of the other three categories.

Although not depicted in Figure 6, US program administrators who responded to the survey in both 2014 and 2015 spent roughly 79 percent of the ratepayer funds that were budgeted for electric DSM in 2014.

3.5.2 United States Program Level Electric DSM Expenditures

Since 2013, CEE has incorporated questions into the US electric survey that ask respondents to report budgets, expenditures, and impact data at the program level when possible[34]. Please refer to section 2.4 for more details on program categories. By collecting electric expenditures by program category, CEE intends to track and provide information to help better understand changes or trends in program offerings.

Of the 169 US program administrators who participated in the 2015 electric survey, 95 percent provided program level energy efficiency or demand response expenditures, which represent 91 percent of all US electric expenditures. When data reported at the program level is aggregated by customer class, these data indicate an expenditure breakdown similar to that in Figure 5, which represents all 2014 expenditure data reported in the 2015 survey and includes the remaining 9 percent of electric DSM expenditures not reported on the program level. Therefore, we conclude that the program level energy efficiency data we obtained in 2015 are representative of overall US electric expenditure trends.

Figure 7 lists the most common energy efficiency program types in terms of expenditures; these programs represent 38 percent of all the program level energy efficiency expenditures reported by respondents. Demand response program expenditures are not listed in this report but are discussed in general in Appendix C.

34 CEE incorporated program level questions for the electric survey only. CEE will continue to work with members and with AGA in the future to determine whether this approach is feasible for the gas program administrators surveyed.

Figure 7 Most Common US Electric Energy Efficiency Program Types by 2014 Expenditures[35]

CUSTOMER CLASS	PROGRAM TYPE	2014 EXPENDITURES
COMMERCIAL AND INDUSTRIAL	MIXED OFFERINGS	$442,971,397
LOW INCOME	-	$350,317,441
COMMERCIAL	GOVERNMENT, NONPROFIT, MUSH	$271,651,303
COMMERCIAL AND INDUSTRIAL	CUSTOM	$257,461,616
COMMERCIAL AND INDUSTRIAL	PRESCRIPTIVE	$236,035,265
RESIDENTIAL	CONSUMER LIGHTING PRODUCT REBATE	$201,108,692
RESIDENTIAL	PRESCRIPTIVE HVAC	$172,263,060

As compared to 2013 program expenditures, Figure 7 indicates that survey respondents reported an increased amount of spending on commercial and industrial mixed offerings programs. Consistent with previous years, prescriptive and custom programs in the commercial and industrial classes constitute a significant portion of the program category expenditures provided, followed by low income and residential lighting and HVAC programs. For a full disclosure of the US electric energy efficiency program expenditures provided by survey respondents, please refer to Appendix B.

3.5.3 United States Electric Demand Response Expenditures

Fifty-seven percent of program administrators who reported 2014 energy efficiency program expenditures also provided demand response expenditures, which suggests that the majority US of electric survey respondents administer a mix of both energy efficiency and demand response programs. Demand response expenditures represent 16 percent of US electric DSM expenditures in 2014 (Figure 5). While this represents a slight decrease from 2013[36], spending on demand response from all sources increased about one percent when adjusted for inflation, coming in at just under $950 million in total.[37] This leads us to believe that demand response programs continue to be a strong component of overall DSM program offerings.

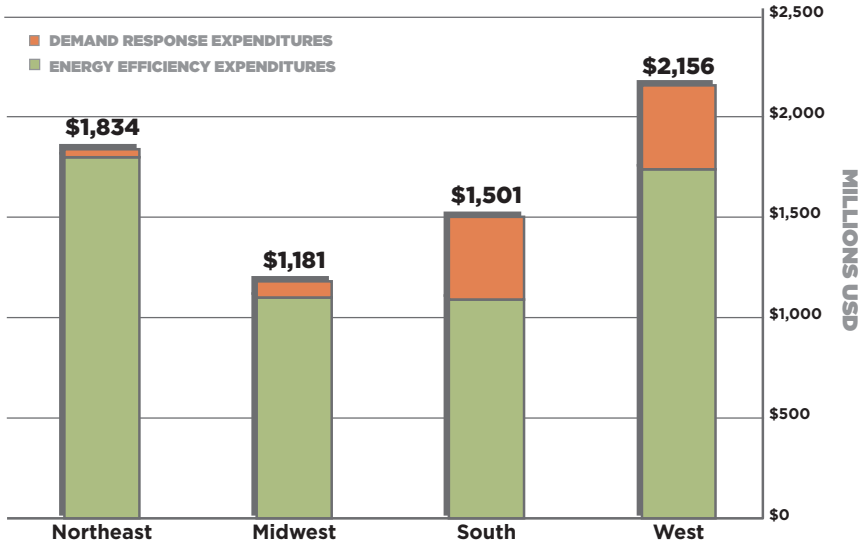
Figure 8 provides a regional snapshot of DSM expenditures in the US in 2014, separated into energy efficiency and demand response.

35 MUSH refers to municipal, university, school and hospital.

36 In 2013, demand response expenditures accounted for 15 percent of total US electric DSM expenditures.

37 2014 US electric demand response expenditures totaled over $941 million from ratepayer funded sources only. This represents a four percent increase over 2013, two percent when accounting for inflation.

Figure 8 US Electric Energy Efficiency and Demand Response Expenditures by Region, 2014



The South and West continue to lead in demand response expenditures. Data indicate that the South and West each represent 44 percent of US demand response expenditures respectively. The West also experienced the greatest increase in demand response expenditures in both dollar terms and as a percentage of 2013 regional demand response expenditures. Additional research by CEE suggests that increased enrollment in demand response programs and recent weather patterns provide potential explanations for these trends in expenditures. According to the Federal Energy Regulatory Commission[38], there has been a national increase in enrollment in demand response programs across the United States in recent years, and this increase has been particularly large in the South and West regions. Furthermore, the increase in demand response activity in the West could be associated with fewer capacity constraints in utility and wholesale electricity systems as a result of summer weather. According to National Oceanic and Atmospheric Administration[39] in 2014, the West climate region saw its highest number of June to August heating and cooling degree-days and its highest Residential Energy Demand Temperature Index (REDTI) since 2010. It is therefore reasonable to estimate that weather played a part in this regions' demand response expenditure increases between 2013 and 2014. On the other hand,

38 Federal Energy Regulatory Commission. "Demand Response & Advanced Metering Staff Report." Accessed: http://ferc.gov/legal/staff-reports/2015/demand-response.pdf December 2015 pg. 16–17

39 National Climate Data Center. "Residential Energy Demand Temperature Index (REDTI)." http://www.ncdc.noaa.gov/societal-impacts/redti/climate9/aug/3-month. Accessed February 22nd, 2016. According to NOAA, "the Residential Energy Demand Temperature Index (REDTI) is based on population weighted heating and cooling degree days, and as such, is a valuable tool for explaining year to year fluctuations in energy demand for residential heating and cooling. Residential energy consumption is known to be highly correlated with heating and cooling degree-days."

the Midwest experienced the largest drop in demand response expenditures in both dollars and as a percentage of 2013 spending.

In 2013, CEE modified the demand response program categories to align with those used by FERC (see section 2.4 for more information). FERC defines several demand response program types and groups them into two major categories: "incentive programs" and "time-based" programs. Appendix C contains charts and supporting information regarding these two categories of demand response programs.

3.5.4 United States Natural Gas Trends

This section discusses natural gas energy efficiency program expenditures in the United States.[40] Figure 9 shows that gas expenditures for energy efficiency programs in the US continued to increase in 2014. US gas program administrators spent $1.27 billion on natural gas efficiency programs in 2014, which represents an 11 percent increase over expenditures in 2013, 8 percent when adjusted for inflation, and a 39 percent increase over 2010 inflation-adjusted expenditures.

Figure 9 US Natural Gas Expenditures, 2010–2014

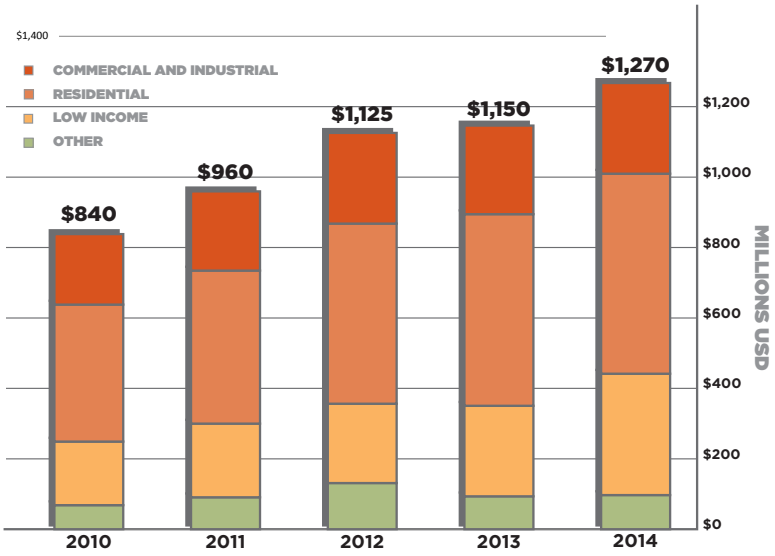


Figure 9 also presents the magnitude of expenditures from 2010 to 2014 by customer class.[41] The data show that residential efficiency programs continue

40 Please note that natural gas programs are only energy efficiency programs. Natural gas demand response programs do not exist within the industry.

41 For ease of comparison between years, note that Figure 9 combines the 2013 and 2014 customer classes commercial and industrial into one commercial and industrial category and combines residential and multifamily into one residential category.

to receive the largest share of natural gas program funding in the US, followed by C&I and low income programs.

Figure 10 provides a more granular breakdown of 2014 US gas expenditures by customer class. For ease of comparison with previous years' reports and with a concurrent report by AGA, we did not break commercial and industrial into separate classes in Figures 9 and 10, but multifamily expenditures are separated from residential expenditures.

Residential expenditures continue to represent the largest share of the total gas program expenditures in 2014 at 39 percent, though this share is three percent lower than in 2013. The commercial and industrial class continues to maintain a relatively stable share, as it has since 2012. Low Income programs represent a slightly higher share of total gas program expenditures in 2014, up from 22 percent in 2013 to 27 percent in 2014.

Figure 10 US Natural Gas Expenditures by Customer Class, 2014

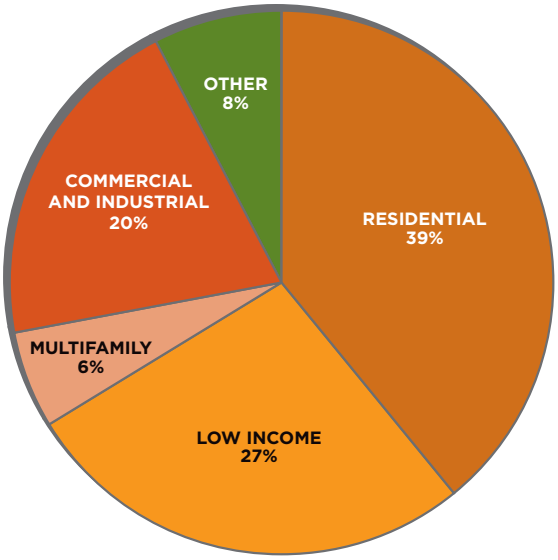
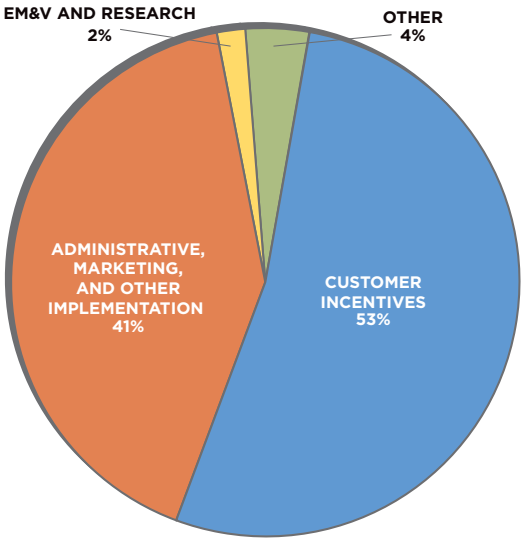


Figure 11 separates 2014 gas expenditures in the US into expenditure categories, which are slightly different from the categories used for US electric programs.[42]

42 The electric and gas surveys request this information in ways that are similar, though not identical.

Figure 11 US Natural Gas Expenditures by Category, 2014



Customer incentives represented more than half of expenditures in 2014, approximately 53 percent, followed by administrative, marketing, and other implementation spending, approximately 41 percent. Research, evaluation, measurement, and verification accounted for two percent of spending, while "other" expenditures accounted for four percent. The "other" category contains all funds that could not be separated into the three specific categories. This breakdown remains consistent with previous year's spending allocations.

Although not depicted in Figure 11 above, US natural gas program administrators budgeted nearly $1.5 billion for natural gas efficiency programs in 2015, which is similar to both 2014 and 2013. Considering just those program administrators who responded to the survey in both 2014 and 2015, programs spent 87 percent of the funds that were budgeted for natural gas programs in 2014.

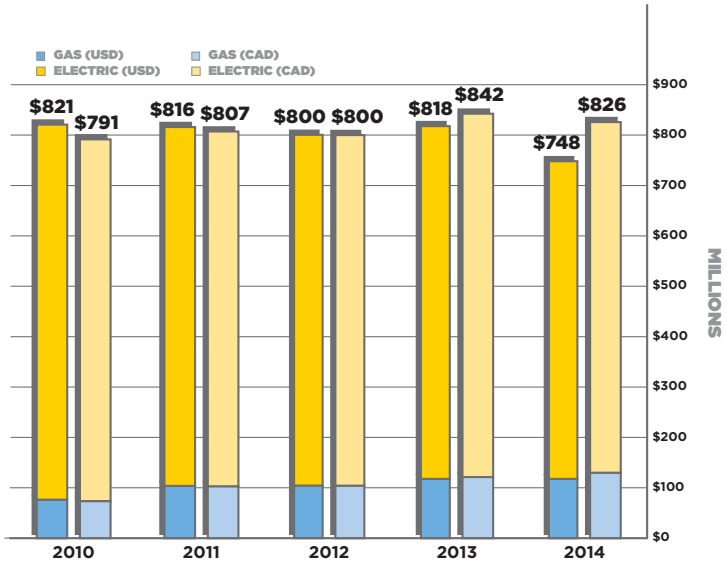
3.6 Canadian DSM Trends

In 2014, Canadian DSM expenditures decreased to $748 million, $826 million CAD. This represents a two percent decrease in CAD expenditures as compared to 2013, or a three percent decrease in CAD expenditures when adjusting for inflation.[43] Figure 12 below presents Canadian DSM expenditures—including both energy efficiency and demand response programs—from 2010 to 2014 in nominal US and Canadian dollars. In previous

43 All Canadian program administrators reported 100 percent ratepayer funded expenditures in the 2015 survey.

year's surveys, one large program administrator reported to CEE that a current energy surplus had caused them to curtail DSM activity slightly for the near future within their service territory and the effect of this surplus can be seen in Figure 12 as expenditures have leveled off and even decreased slightly in recent years. However, Figure 12 also illustrates that, despite decreases in 2014 expenditures, Canadian gas and electric DSM expenditures have remained relatively stable over the past five years, suggesting consistent investment in the efficiency industry.

Figure 12 Canadian DSM Expenditures—Gas and Electric Combined, 2010–2014



The $826 million CAD spent by Canadian DSM program administrators represent 0.05 percent of 2014 Canadian Gross Domestic Product and two percent of value added by the Canadian utility industry in 2014. DSM expenditures were slightly larger than the value added by the "coating, engraving, heat treating and allied activities" industry ($820 million in 2014 dollars) and slightly smaller than the value added by the "computer and peripheral equipment manufacturing" industry ($842 million in 2014 dollars).[44]

In 2015, reporting natural gas and electric DSM program administrators in Canada budgeted almost $815 million, or just under $1.01 billion CAD, on energy efficiency and demand response programs. This represents a decrease of almost nine percent compared to 2014 DSM budgets, a six percent decrease in CAD.

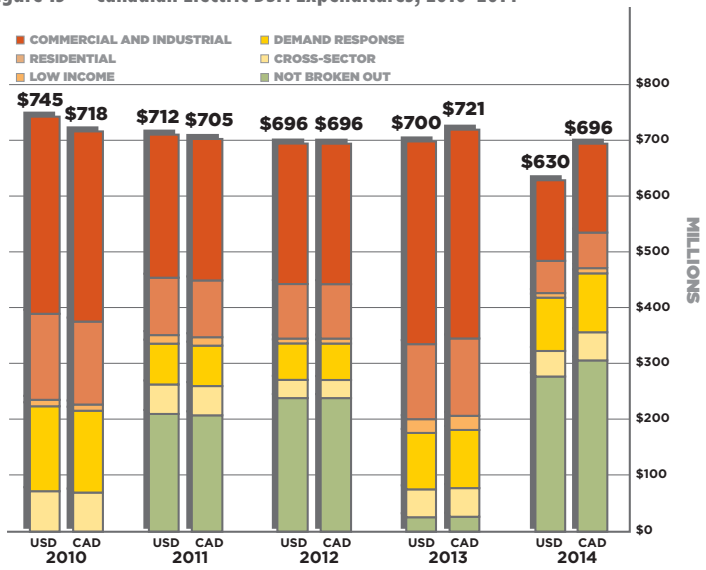
44 Comparisons in this paragraph are based on data from Statistics Canada. No date. *Table 379-0031 Gross Domestic Product (GDP) at basic prices, by North American Industry Classification System (NAICS), Monthly* (table). CANSIM (database). Last updated January 28, 2016. http://www5.statcan.gc.ca/cansim/a01?lang=eng. Accessed February 5, 2016..

3.6.1 Canadian Electric DSM Trends

CEE reports electric DSM trends by customer class and, as discussed in previous sections, asks survey respondents to provide program level data when possible. Respondents who were able to provide these data were asked to select a specific program type for each program (see section 2.4 and Appendix A for more information); CEE then aggregates these data in order to report figures for customer class comparisons.

In 2014, Canadian electric DSM expenditures totaled $630 million USD, $696 million CAD, as shown in Figure 13.[45]

Figure 13 Canadian Electric DSM Expenditures, 2010-2014



The $696 million CAD spent on electric DSM programs in Canada in 2014 represent a four percent decrease from 2013 expenditures, both in nominal dollars and when adjusting for inflation. The proportion of 2014 Canadian electric expenditures represented by the commercial and industrial sector decreased over 50 percent from 2013, while the other customer classes have remained largely stable over time. In 2011, CEE added the "not broken out" class to capture any expenditures program administrators could not allocate to individual customer classes,[46] which in some cases includes overall portfolio activities such as EM&V or administration and marketing.

45 Figure 13 combines the 2014 customer classes commercial, industrial, and C&I into the "commercial and industrial" category. These categories are separated out in Figure 14.

46 See section 2.4 above for more detail about the collection and differentiation of budgets, expenditures, and savings in the 2015 survey.

Notably, the proportion of expenditures classified as "not broken out" increased from four percent in 2013 to 44 percent in 2014. This change is largely the result of at least one large program administrator responding in 2011 and 2014 but not in 2012, 2013, or 2015. In these cases, CEE carried through the previous years' total expenditures as to develop a "straight line" estimate instead of letting their expenditures drop to zero. The prior expenditures for this program administrator were carried into the 2012, 2013, and 2015 data as an estimate in the "not broken out" category.

Figure 14 below depicts 2014 Canadian electric DSM expenditures on a more granular level, broken out by customer class and excluding the "not broken out" category. As 44 percent of 2014 expenditures were reported as "not broken out", CEE cautions against making representations and comparisons regarding 2014 Canadian customer class breakdowns, since a significant portion of expenditure information was excluded from this analysis. Departing from the trend seen over the last year, this view of 2014 expenditures illustrates that demand response programs constitute the largest spending class in Canada in 2014, as residential and commercial and industrial programs each represent relatively lower proportions of total Canadian electric DSM spending. In addition, cross sector and industrial spending also represented relatively higher shares of total spending, as compared to 2012 and 2013. Based on further analysis, CEE believes this shift in expenditure breakdown is largely attributable to the amount of expenditures reported as "not broken out" in 2015. Also, while demand response expenditures represented the largest percentage of customer class expenditures in 2014, total demand response expenditures decreased overall (further discussed in section 3.6.3).

Figure 14 Canadian Electric DSM Expenditures by Customer Class, 2014

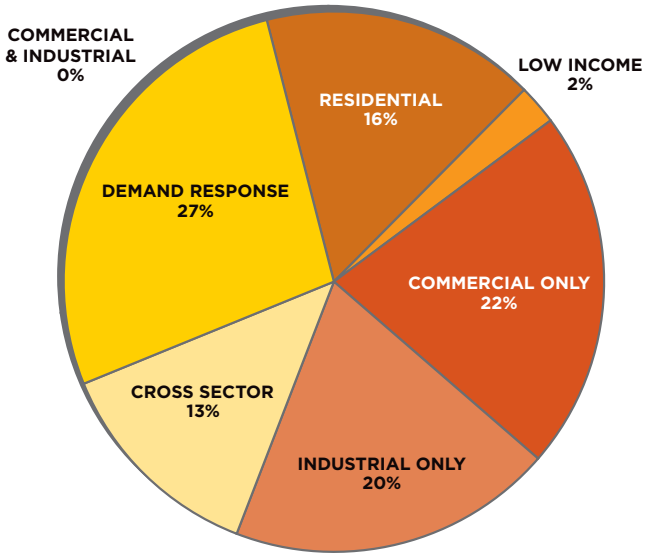
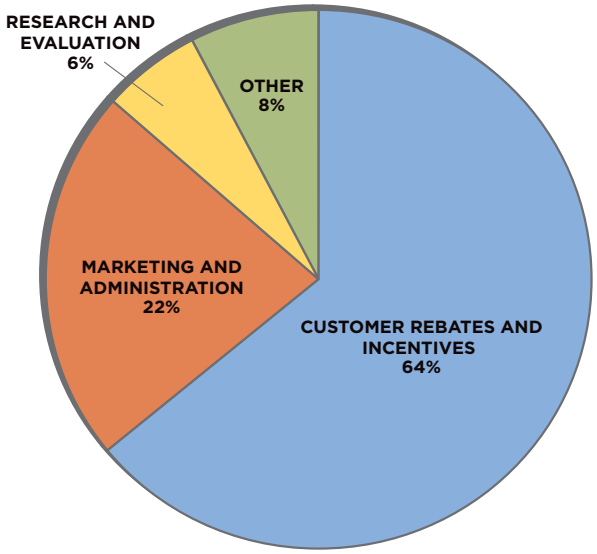


Figure 15 presents the classification of 2014 electric energy efficiency expenditures in Canada by cost category. Customer rebates and incentives represented about two-thirds, 64 percent, of 2014 expenditures, followed by marketing and administration, 22 percent, and research and evaluation, six percent. The other category, eight percent, contains all funds that could not be separated into the previous three categories. This breakdown is consistent with that of the expenditure categories in the previous two years.

Figure 15 Canadian Electric Energy Efficiency Expenditures by Category, 2014



Considering only those program administrators who responded to the survey in both 2014 and 2015, Canadian program administrators spent 77 percent of the ratepayer funds budgeted for electric DSM in 2014. This percentage is down from 81 percent in 2013 and 96 percent in 2012.

Although not depicted in Figure 15, in 2015, Canadian program administrators budgeted just under $700 million, nearly $865 million CAD, for electric DSM programs. 92.67 percent of this funding came exclusively from ratepayers and represents a decrease of eight percent as compared to 2014 budgets when adjusted for inflation. This decrease is driven by the fact that, in 2013, 100 percent of Canadian electric DSM budgets were derived from ratepayer funding.

3.6.2 Canadian Program Level Electric DSM Expenditures

Since 2013, CEE has collected program administrator information at more granular categories for each electric customer class to begin to better understand what types of electric programs and possibly equipment are most common in the industry. CEE has incorporated questions into the electric survey that ask respondents to report budgets, expenditures, and impacts data at the program level if possible[47] (Please refer to section 2.4 for more details on program categories). These data, aggregated to customer class, indicate a breakdown similar to that in Figure 14, which includes data from the three program administrators who were unable to provide information at the program level and adjusting for the fact that no DR expenditures were reported on the program level in Canada. Therefore, we conclude that the program level data we obtained in 2015 are representative of overall Canadian electric energy efficiency expenditure trends.

Figure 16 lists the most common energy efficiency program types in terms of expenditures, excluding program funding categorized as "other." These programs represent approximately 39 percent of all the program level energy efficiency expenditures reported by respondents. Demand response program expenditures are not listed in this report but are discussed in general in Appendix C.

Figure 16 Most Common Canadian Electric Energy Efficiency Program Types by 2014 Expenditures

CUSTOMER CLASS	PROGRAM TYPE	2014 EXPENDITURES (USD)	2014 EXPENDITURES (CAD)
INDUSTRIAL	CUSTOM INDUSTRIAL OR AGRICULTURAL PROCESSES	$49,630,827	$44,955,907
COMMERCIAL	CUSTOM RETROCOMMISSIONING	$24,050,144	$21,784,768
COMMERCIAL	PRESCRIPTIVE LIGHTING	$9,408,530	$8,522,304
LOW INCOME	–	$8,392,106	$7,601,621
COMMERCIAL	NEW CONSTRUCTION	$8,163,124	$7,394,208

Figure 16 indicates that low income programs are again among the top program category expenditures in 2014, as in 2013. In addition, custom programs in the industrial and commercial class constituted two of the top program category expenditures in 2014. Although not shown in this figure, the residential, commercial, and cross sector customer class programs classified as "other" made up almost half, 43 percent, of reported program expenditures.

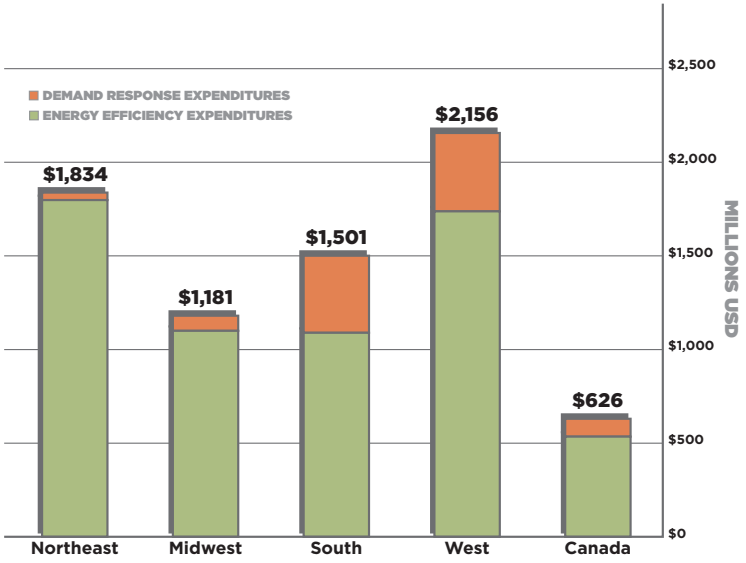
47 CEE incorporated program level questions for the electric survey only. CEE will continue to work with our members and with AGA in the future to determine whether this approach is feasible for the gas program administrators surveyed.

For a full disclosure of the Canadian electric energy efficiency program expenditures provided by survey respondents, please refer to Appendix B.

3.6.3 Canadian Electric Demand Response

The Canadian electric program administrators that responded to this survey spent $96 million, or $106 million CAD, on their demand response programs in 2014, representing a one percent increase in CAD expenditures over 2013, or less than one percent when adjusting for inflation. Demand response accounted for 15 percent of total electric DSM expenditures (Figure 14).

Figure 17 US and Canadian Electric DSM Expenditures by Region, 2014



The percentage of electric expenditures devoted to demand response programs in Canada falls between the percentages of expenditures devoted to demand response in the Midwestern and Western United States and is slightly higher, in absolute terms, than the amount program administrators in the Midwestern United States spent on demand response in 2014. See Appendix C for a breakdown of Canadian DR expenditures into the overall "incentive" and "time-based" categories. [48]

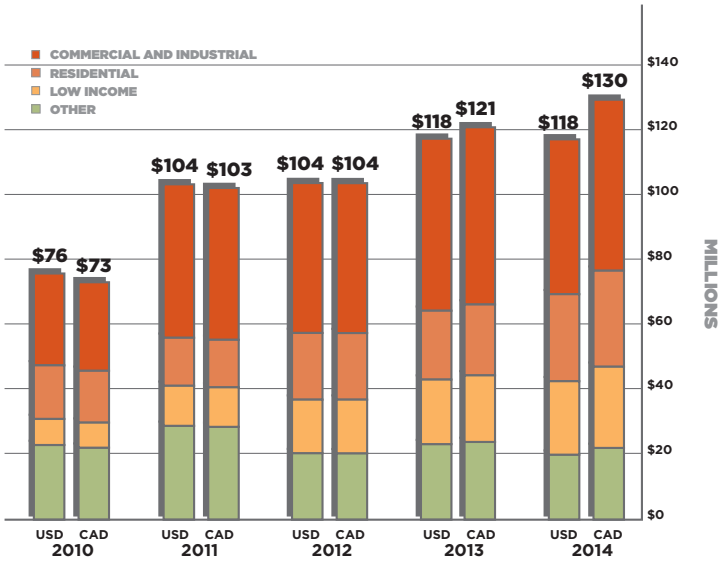
3.6.4 Canadian Natural Gas Trends

Canadian natural gas program CAD expenditures in 2014 increased by seven percent compared to expenditures reported in 2013, six percent when adjusted for inflation. Figure 18 indicates that Canadian program administrators reported 2014 expenditures of $118 million, or $130 million CAD. As evidenced

48 In 2013, CEE modified the demand response program categories to align with those used by FERC (see Section 2.4 for more information).

by the 67 percent increase in DSM expenditures since 2010, Canadian natural gas efficiency programs continue to grow.

Figure 18 Canadian Natural Gas Expenditures, 2010–2014



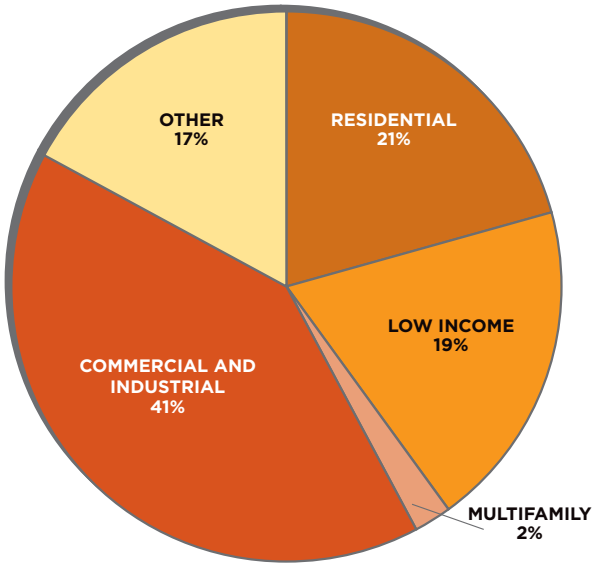
For ease of comparison between years, note that for 2013 onwards Figure 18 combines the customer classes commercial and industrial into one "commercial and industrial" category and combines residential and multifamily into one "residential" category. As in previous years, commercial and industrial programs continue to represent the largest percentage of expenditures in 2014. In addition, the figure above shows that each customer class maintained roughly the same share of total Canadian gas spending as compared with 2013.

In 2014, CEE reported that the change in the relative share of Canadian gas expenditures represented by various customer classes over time has been opposite to that in the United States. In particular, actual expenditures on residential programs have remained largely the same since 2008, but the share of expenditures on residential programs has dropped nine percent since 2009. Data on 2014 gas program expenditures confirm this trend. Commercial and industrial expenditures, on the other hand, have increased greatly since 2008 and have consistently represented over 40 percent of the total gas expenditures for the past four years, although this share, 41 percent, is down slightly since 2013, 45 percent.

To further illustrate this point, Figure 19 shows that commercial and industrial programs accounted for the largest share of total Canadian natural gas efficiency program expenditures in 2014, followed by residential programs, 21 percent; low income programs, 19 percent; and cross sector programs, 17

percent. These percentages identify a relatively different breakdown of customer classes than in 2013, when commercial and industrial programs still constituted the largest share, followed by cross sector programs, then residential and low income programs. For ease of comparison with previous years' reports and with a concurrent report by AGA, we did not break commercial and industrial into separate classes in Figures 18 and 19, but multifamily expenditures are separated from residential expenditures in Figure 19.

Figure 19 Canadian Natural Gas Expenditures by Customer Class, 2014

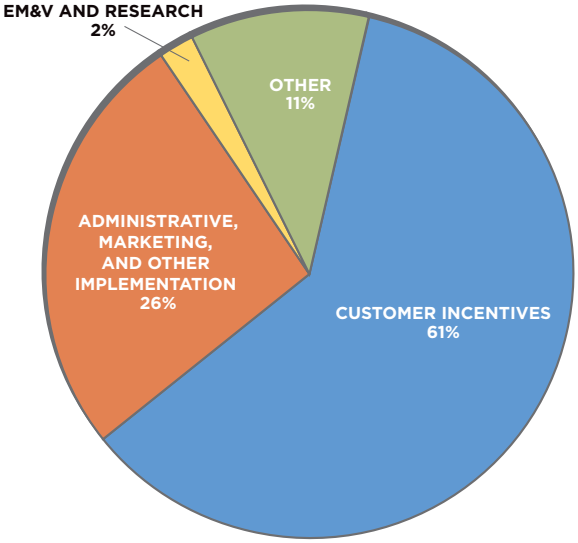


Canadian gas expenditure data in Figure 20 are broken out into slightly different cost categories than those used in the electric data sections of this report.[49]

The category breakdown of Canadian natural gas expenditures remains very similar from 2013 to 2014, with customer incentives representing roughly two-thirds of expenditures in 2014, 61 percent, followed by administrative, marketing, and implementation spending, 26 percent, and the "other" category, 11 percent. This category contains all funds program administrators could not separate into the three more specific categories. Research, evaluation, measurement, and verification expenditures accounted for the remaining two percent of spending.

49 The electric and gas surveys request this information in ways that are similar, though not identical.

Figure 20 Canadian Natural Gas Expenditures by Category, 2014



Canadian natural gas program administrators budgeted just over $115 million, approximately $142 million CAD, for programs in 2015, which represents an increase of four percent from 2014 budgets when adjusted for inflation. Considering just those program administrators who responded to the survey in both 2014 and 2015, programs spent 96 percent of the funds that were budgeted for natural gas programs in 2014.

4 Evaluation, Measurement and Verification

CEE, along with AGA, asked survey respondents to report spending on research and EM&V in 2014. Respondents to the electric survey were asked to provide the percentage of their total 2014 energy efficiency expenditures allocated to EM&V, whereas respondents to the gas survey were asked to provide the dollar amount.[50] Figures 21 and 22 below present the 2014 EM&V expenditures for electric and gas energy efficiency programs in the United States and Canada.[51]

50 Like last year, electric EM&V expenditures in this report exclude demand response.

51 Please note, however, that the total electric expenditures in these figures only include data from program administrators who provided expenditure breakouts by category, so they are smaller than the expenditure totals presented earlier in this report.

Figure 21 US and Canadian Electric EM&V Expenditures, 2014

COUNTRY	2013 EM&V EXPENDITURES (MILLIONS USD)	TOTAL 2013 ENERGY EFFICIENCY EXPENDITURES (MILLIONS USD)*	EM&V % OF TOTAL EXPENDITURES
UNITED STATES	140	5,301	3%
CANADA	16	281	6%
TOTAL	**156**	**5,582**	**3%**

This table includes estimates of EM&V expenditures for electric EE programs that were derived by multiplying total reported expenditures from all sources by an EM&V percentage reported by respondents. Total 2014 expenditures only include data from those respondents who provided a percentage breakout of expenditures by category and are therefore smaller than total EE expenditures listed earlier in the report.

Figure 22 US and Canadian Natural Gas EM&V Expenditures, 2014

COUNTRY	2013 EM&V EXPENDITURES (MILLIONS USD)	TOTAL 2013 ENERGY EFFICIENCY EXPENDITURES (MILLIONS USD)	EM&V % OF TOTAL EXPENDITURES
UNITED STATES	23	1,259	2%
CANADA	3	118	2%
TOTAL	**26**	**1,377**	**2%**

Not all respondents allocate funding for evaluation purposes on an annual basis, and some respondents simply did not respond to this portion of the survey. Based on total energy efficiency expenditures, 76 percent of US and Canadian electric energy efficiency program administrators and 99 percent of US and Canadian gas program administrators provided 2014 EM&V data. EM&V expenditures comprised between two and six percent of the 2014 energy efficiency expenditures in the US and Canada respectively, which is consistent with findings by other research efforts.[52]

Since programs and their evaluation procedures do not necessarily occur at the same time, CEE urges caution when comparing program expenditures to expenditures allocated for EM&V activities in any given year.

52 State and Local Energy Efficiency Action Network. "Energy Efficiency Program Impact Evaluation Guide." State & Local Energy Efficiency Action Network's Evaluation, Measurement, and Verification Working Group. December, 2012, http://www1.eere.energy.gov/seeaction/pdfs/emv_ee_program_impact_guide.pdf, page 7-14.

5 Estimated Program Savings and Environmental Impacts

CEE collected data on energy efficiency savings from gas and electric program administrators in 2014.[53] In order to help respondents report their savings consistently across states and provinces, CEE used the US Energy Information Administration (EIA) definitions of incremental savings. According to the EIA Form EIA-861, incremental savings include all energy savings that accumulated in 2014 from new 2014 participants in existing energy efficiency programs and all participants in new 2014 programs.

CEE collected two different categories of savings values in the survey: net incremental savings and gross incremental savings.[54,55] In keeping with previous reports, this report focuses on gross incremental savings. We emphasize gross incremental savings because they are the most widely tracked savings in the industry. Gross incremental savings are also the most comparable across the United States and Canada because they contain the fewest assumptions embedded in them. In addition, gross savings provide the most useful metric for energy system planners because they include all of the savings that occur regardless of whether they were directly caused by the particular program being evaluated. On the other hand, evaluators and regulators often use net savings to measure against savings goals or to plan subsequent programs because they include only those savings that resulted directly from the program under evaluation. In all tables, CEE intended to only aggregate gross savings figures, but because program administrators did not always report gross savings values in the survey, CEE uses net savings where gross savings were not available.[56]

53 CEE also collects data on energy savings from demand response programs. However, these data are not presented in this report because of inconsistencies that prevented our ability to draw a robust conclusion. CEE is currently examining ways to improve collection of DR savings data in the future.

54 Gross savings generally include all savings claimed by a program, regardless of the reason for participation in the program.

55 Net savings exclude whatever is typically excluded in the jurisdictions of reporting organizations. This often includes, but is not limited to, free riders, savings due to government mandated codes and standards, and the "natural operations of the marketplace," such as reduced use because of higher prices and fluctuations in weather or business cycles. Also, depending on the jurisdiction, net savings sometimes incorporate additional savings resulting from spillover and market effects, which may outweigh the factors noted above and result in values that are greater than gross savings.

56 CEE worked closely with our collaborator AGA to collect savings information from survey participants. This includes collection of "annual" savings, which are incremental savings plus savings in the current year from measures that were implemented in previous years but are expected to still achieve savings. In some cases, AGA has elected to emphasize different savings data collected jointly through this effort from what CEE has chosen to emphasize. For more information on what AGA has published specifically and why, please refer to the reports that are publically available on www.aga.org.

Although CEE worked with survey respondents to ensure they reported savings data as consistently as possible, many organizations calculate and report savings according to requirements in their states or provinces, which may not align exactly with EIA definitions. Not all organizations adjust their estimates to reflect EIA definitions. Finally, due to the timing of the request and differing evaluation cycles across organizations and jurisdictions, savings were often reported prior to evaluation and are subject to change.

5.1 Ratepayer Funded Electric Energy Efficiency Program Savings

Ratepayer funded energy efficiency programs save energy and reduce the amount of greenhouse gases emitted in the United States and Canada. Accordingly, energy efficiency is projected to significantly contribute to state implementation plans to meet carbon dioxide reduction targets mandated under the Clean Air Act section 111(d)[57]. Reporting electric efficiency programs in the United States and Canada estimated incremental electricity savings of approximately 27,520 GWh[58] in 2014 (Figure 23). This is equivalent to roughly 19 million metric tons of avoided CO_2 emissions.[59] CEE member programs accounted for 79 percent of these estimated savings.

As noted in section 2.2 above, this report initially focused only on ratepayer funded programs. Since 2013, CEE and our collaborators have collected information on electric programs derived from all funding sources in order to provide a more comprehensive picture of the DSM industry. Figures 23 and 25 show ratepayer funded electric energy efficiency savings by sector and totals for both ratepayer funded programs and for programs that received funding from other sources.

57 US Environmental Protection Agency. "FACT SHEET: Energy Efficiency in the Clean Power Plan." http://www.epa.gov/cleanpowerplan/fact-sheet-energy-efficiency-clean-power-plan Accessed February 7, 2016

58 As explained in section 2.7 above, we have subsequently revised some data from last year's report based on new information obtained during the 2015 survey process.

59 Calculated using the EPA Greenhouse Gas Equivalencies Calculator., http://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator. February 2016.

Figure 23 US and Canadian Gross Incremental Electric Energy Efficiency Savings, 2014 (GWh) Ratepayer and All Sources Totals*

	RESIDEN-TIAL	LOW INCOME	C&I	OTHER	NO BREAK-OUT	RATE-PAYER TOTAL*	ALL SOURCES TOTAL*
UNITED STATES**							
NORTHEAST	1,842	129	2,650	11	503	5,135	5,409
MIDWEST	2,491	81	2,814	146	2,571	8,103	8,103
SOUTH	2,033	83	2,254	34	200	4,604	4,604
WEST	2,094	119	2,964	1,069	1,762	8,008	8,008
US SUBTOTAL	8,461	413	10,682	1,260	5,036	25,850	26,125
CANADA***	83	6	416	133	1,032	1,670	1,670
BINATIONAL TOTAL	8,544	418	11,098	1,393	6,067	27,520	27,795

* Based on estimated total of all energy savings that accumulated from new participants in existing programs and all participants in new programs in 2014.

* One hundred percent of electric survey respondents in the US that reported EE programs reported a value for incremental energy savings. Of those that reported a value for incremental energy savings, 87 percent reported gross incremental savings. For respondents that did not report gross incremental savings, CEE used net incremental savings in calculating totals.

*** Eighty-five percent of electric survey respondents in Canada that reported EE programs reported a value for incremental energy savings. Of those that reported a value for incremental energy savings, 66 percent reported gross incremental savings. For respondents that did not report gross incremental savings, CEE used net incremental savings in calculating totals.

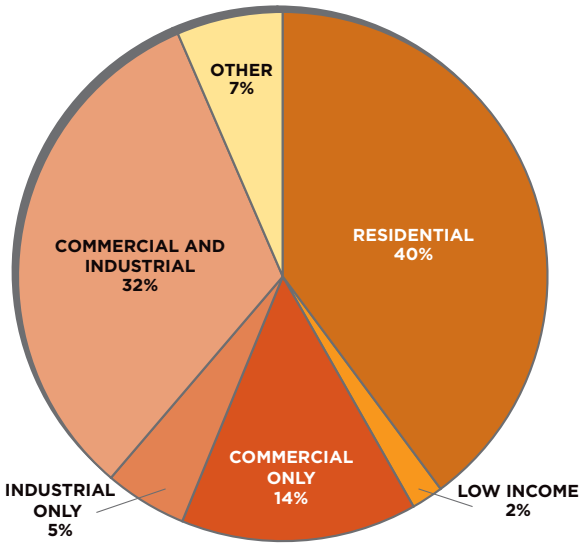
Figure 24 shows that across the United States and Canada, ratepayer funded commercial and industrial electric programs together accounted for just over one half of the total energy savings, 51 percent; followed by residential, 40 percent; other, 7 percent; and low income, two percent. This breakdown is very similar to that of US and Canadian ratepayer electric energy efficiency expenditures, with the exception that the low income customer class makes up a smaller percentage of savings (two percent) than of expenditures (seven percent) and that the residential customer class makes up a larger percentage of savings (40 percent) than of expenditures (33 percent). As ACEEE points out,[60] low income programs are generally mandated for the public benefit. Whereas they may not result in high savings, they may result in significant benefits for program administrators in the form of reduced arrearages, and for customers in the form of lower energy bills and higher disposable income. This likely explains the difference in the proportions of expenditures and savings represented by low income programs.

As noted in section 2.4, respondents to the survey may interpret the categories differently, and not every respondent broke their information out by customer class. Therefore, Figure 24 represents only those savings reported at

60 American Council for and Energy Efficient Economy. "Low-Income Programs." http://aceee.org/topics/low-income-program. Accessed February 7, 2016.

the customer class level and does not include the savings reported as "No Breakout" in Figure 23.

Figure 24 US and Canadian Gross Incremental Electric Energy Efficiency Savings by Customer Class, 2014



Based on the gross incremental savings figure for electric efficiency programs provided in Figure 23 above, in 2014, the value of ratepayer funded electric energy efficiency savings across the United States and Canada was nearly $2.9 billion.[61,62]

Beginning in 2013, CEE asked respondents to provide estimates of capacity savings from their energy efficiency programs. Capacity savings estimates are depicted below in Figure 25.

61 US electric retail values were calculated based on the average retail price of electricity to ultimate customer by end use sector across the US in 2014 using data from the Energy Information Administration's Electric Power Monthly January 2016 issue, which contains YTD 2014 data. Accessed February 2016. http://www.eia.gov/electricity/monthly/epm_table_grapher.cfm?t=epmt_5_03. Average electric rate used: $ 0.1252 per kWh (residential), $0.1074 (commercial), and $0.0710 (industrial). The residential retail rate was used for low income program savings. The rate for combined C&I programs was determined by taking the average of the commercial and industrial retail rates. The rate for "other" programs was determined by taking the average of the residential, commercial, and industrial retail rates.

62 Canadian electric retail values were calculated based on the average rate per kWh across Canada in 2014 using data from a report published by Hydro-Québec titled: "Comparison of Electricity Prices in Major North American Cities." Accessed February 2016. http://www.hydroquebec.com/publications/en/docs/comparaison-electricity-prices/comp_2014_en.pdf. Average electric rate used: $ 0.1205 CAD per kWh (residential) and $0.1006 CAD per kWh (commercial and industrial). The residential retail rate was used for low income program savings. The rate for "other" programs was determined by taking the average of the residential and the commercial and industrial retail rates. These figures are an average of the rates for 12 major cities in Canada and may not reflect the average electricity price for Canada as a whole.

Figure 25 US and Canadian Electric EE Gross Incremental* Capacity Savings (MW)

	RESIDEN-TIAL	LOW INCOME	C & I	OTHER	NO BREAK-OUT	RATE-PAYER TOTAL	ALL SOURCES TOTAL
UNITED STATES**							
NORTHEAST	366	20	302	1	98	786	838
MIDWEST	427	9	401	26	439	1,301	1,301
SOUTH	512	39	425	46	261	1,283	1,283
WEST	245	21	383	162	8	819	819
US SUBTOTAL	1,549	89	1,510	235	806	4,190	4,241
CANADA***	41	3	187	0	166	398	398
BINATIONAL TOTAL	1,590	93	1,698	235	972	4,588	4,640

*Based on estimated total of all capacity savings that accumulated from new participants in existing programs and all participants in new programs in 2014.

**Seventy-nine (79) percent of electric survey respondents in the US that reported EE programs reported a value for incremental capacity savings. Of those that reported a value for incremental energy savings, eighty-three (83) percent reported gross incremental savings. For respondents that did not report gross incremental savings, CEE used net incremental savings in calculating totals.

***Seventy-one (71) percent of respondents in Canada that reported EE programs reported a value for incremental capacity savings. Of those that reported a value for incremental savings, eighty (80) percent reported gross incremental savings. For respondents that did not report gross incremental savings, CEE used net incremental savings in calculating totals.

Unlike energy savings, which are reported in kilo, mega, or gigawatt hours and measure the amount of energy saved over time, capacity savings are measured in kilo, mega, or gigawatts and represent reductions in forecasted demand that occur at a particular time, generally during hours of peak demand. The capacity savings that result from energy efficiency programs can be very valuable, particularly in areas with constrained transmission capacity or high summer or winter peaks.

5.2 Electric Demand Response Program Savings

In 2015, CEE asked demand response program administrators to report the number of events called for each of their DR programs, the average savings per event, and each program's target (summer peak, winter peak, another peak, or nonpeak, which refers to a target other than a peak). Survey respondents could designate their programs as having more than one target.[63] Respondents only reported ten other peak programs and seven nonpeak programs. The majority of programs in each of these categories were identified as having multiple targets. Thus, the savings for other peak and nonpeak programs reported below are likely overestimates at the expense of summer and winter peak programs. CEE will consider soliciting more

63 Note that program target is separate from program type, for example, direct load control; savings by program type are not analyzed here.

information on other peak and nonpeak programs in the future in order to better estimate the associated savings.

We report both total MW savings and average MW savings per event below, grouped by region and program target. Total MW savings—average savings per event multiplied by the number of events—are abstract in that they denote the total capacity reduced in the course of an entire program year. In 2015, CEE did not ask respondents for their peak duration and therefore could not calculate total MWh savings from the total savings below. This report presents total MW savings to provide a general idea of program-related capacity reductions, but we believe average MW reductions per event provide a much better indicator of program activity.

Figure 26 US and Canadian Electric DR Total MW Savings by Program Target and Region

	SUMMER	WINTER	OTHER PEAK	NO PEAK	MW SUBTOTALS
NORTHEAST	29	-	-	-	29
MIDWEST	2,135	-	519	-	2,654
SOUTH	24,632	3,694	-	184	28,509
WEST	15,301	897	3,005	3,345	22,548
CANADA	-	-	-	2	2
TOTALS	42,096	4,591	3,524	3,531	53,742

Note that CEE asks respondents to include programs run within their service territories and to exclude any programs run solely by or within the wholesale markets. As shown in Figure 26, US and Canadian DR programs reduced capacity by 53,742 MW in 2014[64]. Fifty-three percent of savings came from programs in the West, forty-two percent from programs in the South, five percent from programs in the Midwest, and the remainder from programs in the Northeast and in Canada. Only one respondent in the Northeast and one respondent in Canada reported DR savings this year.

As previously discussed in section 3.5.3 in regard to demand response expenditures, it is plausible that increases in demand response program enrollment and recent weather patterns have contributed to the large percentage of savings stemming from the South and West regions of the United States.

Seventy-eight percent of savings were achieved during summer peaks, eight percent during winter peaks, seven percent during other peaks, and seven percent in relation to programs that did not target a peak.

64 For reference, FERC reported that in 2013 the potential peak reduction from all retail demand response programs in the United States was 27,095 MW. Federal Energy Regulatory Commission. "Demand Response & Advanced Metering Staff Report." Accessed: http://ferc.gov/legal/staff-reports/2015/demand-response.pdf December 2015 pg. 11

Figure 27 US and Canadian Electric DR Average MW Savings by Region and Program Target

	SUMMER	WINTER	OTHER PEAK	NO PEAK	MW SUBTOTALS
NORTHEAST	29	-	-	-	29
MIDWEST	46	-	65	-	49
SOUTH	78	27	-	92	62
WEST	52	60	48	64	53
CANADA	-	-	-	2	2
TOTALS	64	30		64	57

Figure 27 presents average MW savings by region and target. Demand response programs in the US and Canada saved 57 MW on average, per event, in 2014[65]. The South saved the most on average per event, 62 MW. Considering program targets, summer peak programs and nonpeak programs both saved 64 MW on average per event.

5.3 Ratepayer Funded Natural Gas Program Savings

Reporting natural gas efficiency programs in the United States and Canada estimated incremental savings of nearly 459 million therms of gas in 2014 (Figure 26). This is equivalent to over 2.4 million metric tons of avoided CO_2 emissions. CEE member programs accounted for 80 percent of the total energy savings estimate.

Figure 28 US and Canadian Incremental Natural Gas Savings in MDth, 2014

	RESIDEN-TIAL	LOW NCOME	MULTI-FAMILY	C & I	OTHER	NO BREAK-OUT	RATE-PAYER TOTAL
UNITED STATES **							
NORTHEAST.	3,820	1,026	581	4,086	889	0	10,403
MIDWEST	5,987	502	805	8,636	248	0	16,179
SOUTH	646	127	1	356	0	0	1,130
WEST	2,719	640	203	4,845	997	0	9,404
US SUBTOTAL	13,172	2,296	1,591	17,923	2,134	0	37,116
CANADA ***	251	148	0	4,505	3,847	0	8,751
BINATIONAL TOTAL	13,423	2,444	1,591	22,429	5,981	0	45,867

*Based on estimated total of all energy savings that accumulated from new participants in existing programs and all participants in new programs in 2014.
** Eighty-five (85) percent of all gas respondents in the US that reported gas programs reported a value for incremental savings. Of those that reported a value for incremental savings, eighty-four

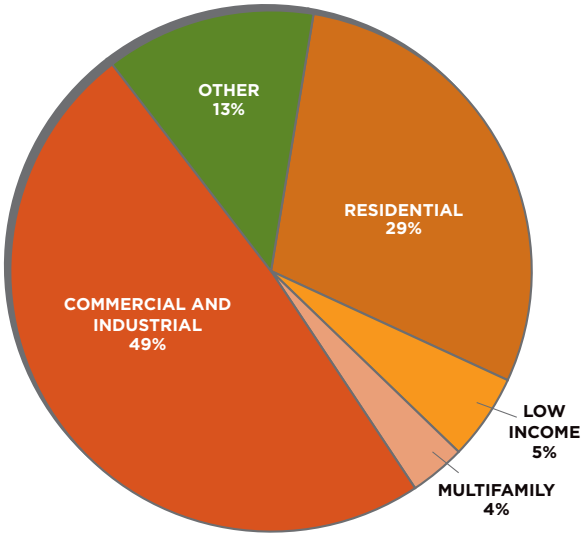
65 To get a sense of magnitude for average US and Canadian DR capacity savings, 57 MW represents roughly a third of the peak capacity of a natural gas combined cycle generating unit in the US according to 2014 EIA Form 860, Schedule 3 data. In addition, using 2014 EIA Form 860, Schedule 3 data, the "total" DR savings of 53,742 MW is roughly equivalent to the combined net summertime capacity of the 44 largest power plants in the US (or at least the ones that responded to the EIA data request). Data accessed from https://www.eia.gov/electricity/data/eia860/

(84) percent reported gross incremental savings. For respondents that did not report gross incremental savings, CEE used net incremental savings in calculating totals.

** Eighty-three (83) percent of all gas respondents in Canada that reported gas programs reported a value for incremental savings. Of those that reported a value for incremental savings, eighty (80) percent reported gross incremental savings

As shown in Figure 29, across the United States and Canada, commercial and industrial programs accounted for the majority of energy savings, 49 percent, followed by residential programs, 29 percent. Multifamily programs came in at four percent while low income programs represented five percent of total savings. "Other" programs accounted for thirteen percent of the estimated natural gas energy savings and include programs not allocable by customer class. This breakdown is somewhat different from that of US and Canadian gas energy efficiency expenditures, in which residential programs accounted for 37 percent of expenditures, low income programs accounted for 26 percent, and C&I programs accounted for 22 percent. This may indicate high savings per dollar spent in the C&I sector, but it may also reflect a difference in reported savings type—gross or net—between program administrators with high residential and high C&I expenditures.[66]

Figure 29 US and Canadian Gross Incremental Natural Gas Savings by Customer Class, 2014



Based on the gross incremental savings for natural gas efficiency programs provided in Figure 26 above, in 2014, the value of natural gas energy efficiency savings across the United States and Canada totaled approximately

66 See the opening paragraphs of section 5 for more information on the savings accounting scheme used in this report.

$393 million.[67] Figure 29 depicts gross incremental savings for US and Canadian natural gas programs broken out by customer class.

67 Natural gas retail values for the United States and Canada were calculated based on the average retail price per thousand cubic feet across the United States in 2014 using data from Energy Information Administration: Natural Gas Prices, Released January 29, 2016. Accessed February 2016. http://www.eia.gov/dnav/ng/ng_pri_sum_dcu_nus_a.htm. Average natural gas prices used: $10.90 per Mcf (residential), $8.90 per Mcf (commercial), and $5.55 per Mcf (industrial). The residential retail rate was used for low income and multifamily program savings. The rate for combined C&I programs was determined by taking the average of the commercial and industrial retail rates. The rate for "other" programs was calculated by taking the average of the residential, commercial, and industrial retail rates.

Appendix A Electric Energy Efficiency Program Categories

Respondents who could provide data for individual programs were asked to select a customer class and then a program type for each program they identified. If it was not possible to provide data on the program level, respondents were asked to provide rough percentage breakdowns of their budgets, expenditures, and savings into customer classes and then to provide further percentage breakdowns by common program types (again, if possible). This appendix provides the title and definition for each program type, grouped by customer class. CEE slightly modified some program categories in 2014 based on feedback from respondents and discussions with Lawrence Berkeley National Laboratory; similar modifications may occur in future years for the purposes of the CEE research effort.

Residential Programs

Appliance recycling Programs designed to remove less efficient appliances, typically refrigerators and freezers, from households.

Behavior, online audit, feedback Residential programs designed around directly influencing household habits and decision making on energy consumption through quantitative or graphical feedback on consumption, sometimes accompanied by tips on saving energy. These programs include behavioral feedback programs in which energy use reports compare a consumer's household energy consumption with those of similar consumers, online audits that are completed by the consumer, and in-home displays that help consumers assess their use in near real time. This program category does not include on-site energy assessments or audits.

Consumer product rebate for appliances Programs that incentivize the sale, purchase, and installation of appliances such as refrigerators, dishwashers, clothes washers, and dryers, that are more efficient than current standards. Appliance recycling and the sale, purchase, and installation of HVAC equipment, water heaters, and consumer electronics are accounted for separately.

Consumer product rebate for electronics Programs that encourage the availability and purchase or lease of more efficient personal and household electronic devices, including but not limited to televisions, set-top boxes, game consoles, advanced power strips, cordless telephones, PCs and peripherals specifically for home use along with chargers for phones, smart phones, and tablets. A comprehensive efficiency program to decrease the electricity use of

consumer electronics products includes two foci: product purchase and product use. Yet not every consumer electronics program seeks to be comprehensive. Some programs embark on ambitious promotions of multiple electronics products, employing upstream, midstream, and downstream strategies with an aggressive marketing and education component. At the other end of the continuum, a program administrator may choose to focus exclusively on consumer education.

Consumer product rebate for lighting Programs aimed specifically at encouraging the sale, purchase, and installation of more efficient lighting in the home. These programs range widely from point-of-sale rebates to CFL mailings or giveaways. Measures tend to be CFLs, fluorescent fixtures, LED lamps, LED fixtures, LED holiday lights, and lighting controls, including occupancy monitors and switches.

Financing Programs designed to provide or facilitate loans, credit enhancements, or interest rate reductions and buy downs. As with other programs, utility costs are included, such as the costs of any inducements for lenders (for example, loan loss reserves, interest rate buy downs, et cetera). Where participant costs are available for collection, these ideally include the total customer share, that is both principal (meaning the participant payment to purchase and install measures) and interest on that debt. Most of these programs are directed towards enhancing credit or financing for residential structures.

Multifamily Multifamily programs are designed to encourage the installation of energy efficient measures in common areas, units, or both, for residential structures of more than four units. These programs may be aimed at building owners or managers, tenants, or both.

New construction Programs that provide incentives and possibly technical services to ensure new homes are built or manufactured to energy performance standards higher than applicable code, for example, ENERGY STAR® Homes. These programs include new multifamily residences and new or replacement mobile homes.

Prescriptive HVAC Programs designed to encourage the distribution, sale, purchase, and proper sizing and installation of HVAC systems that are more efficient than current standards. Programs tend to support activities that focus on central air conditioners, air source heat pumps, ground source heat pumps, and ductless systems that are more efficient than current energy performance standards, as well as climate controls and the promotion of quality installation and quality maintenance.

Prescriptive insulation Programs designed to encourage the sale, purchase, and installation of insulation in residential structures, often through per square foot incentives for insulation of specific R-values versus an existing baseline. Programs may be point-of-sale rebates or rebates to insulation installation contractors.

Prescriptive pool pump Programs that incentivize the installation of higher efficiency or variable speed pumps and controls, such as timers, for swimming pools.

Prescriptive water heater Programs designed to encourage the distribution, sale, purchase, and installation of electric or gas water heating systems that are more efficient than current standards, including high efficiency water storage tank and tankless systems.

Prescriptive windows Programs designed to encourage the sale, purchase, and installation of efficient windows in residential structures.

Prescriptive other Residential programs that provide or incentivize a set of preapproved measures not included in, or distinguishable from, the other residential program categories, such as whole home direct install, HVAC, or lighting. For example, if a residential program features rebates for a large set of mixed, preapproved offerings, such as insulation, HVAC, appliances, and lighting, yet the relative contribution of each measure to program savings is unclear or no single measure accounts for a large majority of the savings, then the program should be classified simply as a "prescriptive other" program.

Whole home audits Residential audit programs provide a comprehensive, stand-alone assessment of a home's energy consumption and identification of opportunities to save energy. The scope of the audit includes the whole home, although the thoroughness and completeness of the audit may vary widely, from a modest examination and development of a simple engineering model of the physical structure to a highly detailed inspection of all spaces, testing for air leakage or exchange rates, testing for HVAC duct leakage, and highly resolved modeling of the physical structure with benchmarking to customer utility bills.

Whole home direct install Direct install programs provide a set of preapproved measures that may be installed at the time of a visit to the customer premises or provided as a kit to the consumer, usually at modest or no cost to the consumer and sometimes accompanied by a rebate. Typical measures include CFLs, low flow showerheads, faucet aerators, water heater wrap, and weather stripping. Such programs also may include a basic walk-through energy assessment or audit, but the savings are principally derived

from the installation of the provided measures. Education programs that supply kits by sending them home with school children are not included in this program category as they are classified as education programs.

Whole home retrofit Whole home energy upgrade or retrofit programs combine a comprehensive energy assessment or audit that identifies energy savings opportunities with whole house improvements in air sealing, insulation, and often HVAC systems and other end uses. The HVAC improvements may range from duct sealing, to a tune-up, or a full replacement of the HVAC systems. Whole home programs are designed to address a wide variety of individual measures and building systems, including but not limited to: HVAC equipment, thermostats, furnaces, boilers, heat pumps, water heaters, fans, air sealing, insulation (of the attic, walls, or basement), windows, doors, skylights, lighting, and appliances. As a result, whole home programs generally involve one or more rebates for multiple measures. Whole home programs generally come in two types, comprehensive programs that are broad in scope, and less comprehensive prescriptive programs, sometimes referred to as "bundled efficiency" programs. This category addresses all of the former and most of the latter, but it excludes direct install programs that are accounted for separately.

Other Programs designed to encourage investment in energy efficiency activities in residences but are so highly aggregated and undifferentiated (such as existing homes programs that include retrofits, appliances, equipment, et cetera) that they cannot be sorted into the residential program categories that are detailed above.

Low Income

Low income programs are efficiency programs aimed at lower income households, based upon some types of income testing or eligibility. These programs most often take the form of a single family weatherization, but a variety of other program types are also included in this program category, for example, multifamily or affordable housing weatherization, or low income direct install programs.

Commercial Programs

Custom audit Programs in which an energy assessment is performed on one or more participant commercial or industrial facilities to identify sources of potential energy waste and measures to reduce that waste.

Custom retrocommissioning Programs aimed at diagnosing energy consumption in a commercial facility and optimizing its operations to minimize energy waste. Such programs may include the installation of certain measures, such as occupancy monitors and switches, but program activities tend to be characterized more by tuning, coordinating, and testing the operation of existing end uses, systems, and equipment for energy efficient operation. The construction of new commercial facilities that include energy performance commissioning should be categorized as "new construction". The de novo installation of energy management systems with accompanying sensors, monitors, and switches is regarded as a major capital investment and should be categorized under "custom other".

Custom other Programs designed around the delivery of site-specific projects typically characterized by an extensive onsite energy assessment and identification and installation of multiple measures unique to that facility. These measures may vary significantly from site to site. This category is intended to capture whole building approaches to commercial sector efficiency opportunities for a wide range of building types and markets (for example, office or retail) and a wide range of measures.

Financing Programs designed to provide or facilitate loans, credit enhancements, or interest rate reductions and buy downs. As with other programs, utility costs are included, such as the costs of any inducements for lenders (for example, loan loss reserves, interest rate buy downs, et cetera). Where participant costs are available for collection, these ideally include the total customer share, that is, both principal (meaning the participant payment to purchase and install measures) and interest on that debt. Most of these programs are directed toward enhancing credit or financing for commercial structures.

Government, nonprofit, MUSH Government, nonprofit, and MUSH (municipal, university, school, and hospital) programs cover a broad swath of program types generally aimed at public and institutional facilities and include a wide range of measures. Programs that focus on specific technologies, such as HVAC and lighting, have their own commercial program categories. Examples include incentives or technical assistance to promote energy efficiency upgrades for elementary schools, recreation halls, and homeless shelters. Street lighting is accounted for as a separate program category.

New construction Programs that incentivize owners or builders of new commercial facilities to design and build beyond current code or to a certain certification level, such as ENERGY STAR® or LEED®.

Prescriptive grocery Grocery programs are prescriptive programs aimed at supermarkets and are usually designed around indoor and outdoor lighting and refrigerated display cases.

Prescriptive HVAC Commercial HVAC programs encourage the sale, purchase, and installation of heating, cooling, or ventilation systems at higher efficiency than current energy performance standards, across a broad range of unit sizes and configurations.

Prescriptive IT and office equipment Programs aimed at improving the efficiency of office equipment, chiefly commercially available PCs, printers, monitors, networking devices, and mainframes, not rising to the scale of a server farm or floor. Programs for data centers are included in the industrial sector, under the "custom data centers" category.

Prescriptive lighting Commercial lighting programs incentivize the installation of higher efficiency lighting and controls. Typical measures might include T8 or T5 fluorescent lamps and fixtures, CFLs and fixtures, LEDs (for lighting displays, signs, and refrigerated lighting), metal halide and ceramic lamps and fixtures, occupancy controls, daylight dimming, and timers.

Prescriptive performance contract or DSM bidding Programs that incentivize or otherwise encourage energy services companies (ESCOs) and participants to perform energy efficiency projects, usually under an energy performance contract (EPC), a standard offer, or another arrangement that involves ESCOs or customers offering a quantity of energy savings in response to a competitive solicitation process with compensation linked to achieved savings.

Prescriptive other Prescriptive programs that encourage the purchase and installation of some or all of a specified set of preapproved measures besides those covered in other measure-specific prescriptive programs, such as HVAC and lighting.

Small commercial custom Custom programs applied to small commercial facilities. See the "custom" commercial categories for additional detail.

Small commercial prescriptive Prescriptive programs applied to small commercial facilities. See the "prescriptive" commercial categories for additional detail. Such programs may range from a walk-through audit and direct installation of a few preapproved measures to a fuller audit and a fuller package of measures. Audit only programs have their own category.

Street lighting Street lighting programs include incentives or technical support for the installation of higher efficiency street lighting and traffic lights than current baseline.

Other Programs not captured by any of the specific industrial or commercial categories but that are sufficiently detailed or distinct to not be treated as a General C&I program. For example, an energy efficiency program aimed specifically at the commercial subsector but is not clearly prescriptive or custom in nature might be classified as "other".

Industrial or Agricultural Programs

Custom audit Programs in which an energy assessment is performed on one or more participant industrial or agricultural facilities to identify sources of potential energy waste and measures to reduce that waste.

Custom data centers Data center programs are custom designed around large-scale server floors or data centers that often serve high tech, banking, or academia. Projects tend to be site specific and involve some combination of lighting, servers, networking devices, cooling chillers, and energy management systems and software. Several of these may be of experimental or proprietary design.

Custom industrial or agricultural processes Industrial programs that deliver custom designed projects that are characterized by onsite energy and process efficiency assessment and a site specific measure set focused on process related improvements that may include, for example, substantial changes in a manufacturing line. This category includes all energy efficiency program work at industrial or agricultural sites that is focused on process and not generic (such programs belong in the custom category) and not otherwise covered by the single measure prescriptive programs, such as lighting, HVAC, and water heaters.

Custom refrigerated warehouses Warehouse programs are typically aimed at large-scale refrigerated storage facilities and often target end uses such as lighting, climate controls, and refrigeration systems.

Custom other Programs designed around the delivery of site specific projects typically characterized by an extensive onsite energy assessment and identification and installation of multiple measures unique to that facility. These measures may vary significantly from site to site. This category is intended to capture whole facility approaches to industrial or agricultural sector efficiency opportunities for a wide range of building types and markets.

Financing Programs designed to provide or facilitate loans, credit enhancements, or interest rate reductions and buy downs. As with other programs, utility costs are included, such as the costs of any inducements for

lenders (for example, loan loss reserves, interest rate buy downs, et cetera). Where participant costs are available for collection, these ideally include the total customer share, that is, both principal (meaning the participant payment to purchase and install measures) and interest on that debt. Most of these programs are directed toward enhancing credit or financing for industrial or agricultural structures.

New construction Programs that incentivize owners of builders of new industrial or agricultural facilities to design and build beyond current code or to a certain certification level, such as ENERGY STAR® or LEED®.

Prescriptive agriculture Farm and orchard agricultural programs that primarily involve irrigation pumping and do not include agricultural refrigeration or processing at scale.

Prescriptive motors Motors programs usually offer a prescribed set of approved, higher efficiency motors, with industrial motors programs typically getting the largest savings from larger, high powered motors, greater than 200 horsepower.

Prescriptive other Prescriptive programs that encourage the purchase and installation of some or all of a specified set of preapproved measures besides those covered in other measure specific prescriptive programs on this list.

Self direct Industrial programs that are designed to be delivered by the participant, using funds that otherwise would have been paid as ratepayer support for all DSM programs. These programs may be referred to as "opt out" programs, among other names.

Other Programs not captured by any of the specific industrial or agricultural program categories but that are sufficiently distinct to the industrial and agricultural sector to not be treated as a C&I program, e.g. programs aimed specifically at an industrial subsector, but that are not clearly prescriptive or custom in nature.

C&I Programs

Audit Programs in which an energy assessment is performed on one or more participant facilities to identify sources of potential energy waste and measures to reduce that waste.

Custom Programs designed around the delivery of site-specific projects typically characterized by an extensive onsite energy assessment and identification and installation of multiple measures unique to that facility.

These measures may vary significantly from site to site. This category is for programs that address both the commercial and industrial sectors and cannot be relegated to one sector or another for lack of information on participation or savings.

Mixed offerings Programs that cannot be classified under any of the specific commercial or industrial program categories and that span a large variety of offerings aimed at both the commercial and industrial sectors.

New construction Programs that incentivize owners or builders of new commercial or industrial facilities to design and build beyond current code or to a certain certification level, such as ENERGY STAR® or LEED®. This category should be used sparingly for those programs that cannot be identified with either the commercial or industrial sector on the basis of information available about participation or the sources of savings.

Prescriptive Prescriptive programs that encourage the purchase and installation of some or all of a specified set of preapproved industrial or commercial measures but which cannot be differentiated by sector based upon the description of the participants or the nature or source of savings.

Self direct Generally large commercial and industrial programs that are designed and delivered by the participant, using funds that otherwise would have been paid as ratepayer support for all DSM programs. This category is to be used for self direct or opt out programs that address both large commercial and industrial entities but that cannot be differentiated between these sectors because the nature and source of the savings is not available or is also too highly aggregated.

Other Programs not captured by any of the specific industrial or commercial categories and are sufficiently distinct to the industrial and commercial sectors but cannot be differentiated by individual sector.

Cross Sector

Codes and standards In codes and standards programs, the program administrator may engage in a variety of activities designed to advance the adoption, application or compliance level of building codes and end use energy performance standards. Examples might include advocacy at the state or federal level for higher standards for HVAC equipment; training of architects, engineers, builders, and developers on compliance; and training of building inspectors in ensuring the codes are met.

Market transformation Programs that encourage a reduction in market barriers resulting from a market intervention, as evidenced by a set of market effects that is likely to last after the intervention has been withdrawn, reduced, or changed. Market transformation programs are gauged by their market effects, for example increased awareness of energy efficient technologies among customers and suppliers, reduced prices for more efficient models, increased availability of more efficient models, and ultimately, increased market share for energy efficient goods, services, and design practices. Example programs might include upstream incentives to manufacturers to make more efficient goods more commercially available and point-of-sale or installation incentives for emerging technologies that are not yet cost-effective. Workforce training and development programs are covered by a separate category. Upstream incentives for commercially available goods are sorted into the program categories for those goods, fore example, consumer electronics or HVAC.

Marketing, education, and outreach Includes most standalone marketing, education, and outreach programs, e.g. statewide marketing, outreach, and brand development. This category also covers in-school energy and water efficiency programs, including those that supply school children with kits of prescriptive measures such as CFLs and low flow showerheads for installation at home.

Multisector rebates Multisector rebate programs include those providing incentives for commercially available end use goods for multiple sectors, such as PCs, or HVAC.

Planning, evaluation, other program support These programs are separate from marketing, education, and outreach programs and include the range of activities not otherwise accounted for in program costs, but that are needed for planning and designing a portfolio of programs and for otherwise complying with regulatory requirements for DSM activities outside of program implementation. These activities generally are focused on the front and back end of program cycles, in assessing prospective programs; designing programs and portfolios; assessing the cost-effectiveness of measures, programs, and portfolios; and arranging for, directing, or delivering reports and evaluations of the process and impacts of those programs where those costs are not captured in program costs.

Research These programs are aimed generally at helping the program administrator identify new opportunities for energy savings, for example, research on emerging technologies or conservation strategies. Research conducted on new program types or the inclusion of new, commercially

available measures in an existing program are accounted for separately under cross cutting program support.

Shading and cool roofs Shading and reflective programs include programs designed to lessen heating and cooling loads through changes to the exterior of a structure, such as tree plantings to shade walls and windows, window screens, and cool roofs. These programs are not necessarily specific to a sector.

Voltage reduction transformers Programs that support investments in distribution system efficiency or enhance distribution system operations by reducing losses. The most common form of these programs involve the installation and use of conservation voltage regulation or reduction or optimization systems and practices that control distribution feeder voltage so that utilization devices operate at their peak efficiency, which is usually at a level near the lower bounds of their utilization or nameplate voltages. Other measures may include installation of higher efficiency transformers. These programs generally are not targeted to specific end users but typically involve changes made by the electricity distribution utility.

Workforce development Workforce training and development programs are a distinct category of market transformation program designed to provide the underlying skills and labor base for deployment of energy efficiency measures.

Other This category is intended to capture all programs that cannot be allocated to a specific sector, or are multisectoral, and cannot be allocated to a specific program type.

Appendix B List of US and Canadian Electric Energy Efficiency Program Category Expenditures

Figure B-1 US Electric Energy Efficiency Program Category Expenditures in USD

CUSTOMER CLASS	PROGRAM TYPE	2014 EXPENDITURES
RESIDENTIAL	OTHER	$528,045,701.05
COMMERCIAL AND INDUSTRIAL	MIXED OFFERINGS	$442,971,397.24
LOW INCOME	-	$350,317,441.97
COMMERCIAL AND INDUSTRIAL	OTHER	$303,625,656.75
COMMERCIAL	GOVERNMENT, NONPROFIT, MUSH	$271,651,303.00
COMMERCIAL AND INDUSTRIAL	CUSTOM	$257,461,616.28
CROSS SECTOR	OTHER	$248,696,257.11
COMMERCIAL	OTHER	$240,135,830.94
COMMERCIAL AND INDUSTRIAL	PRESCRIPTIVE	$236,035,265.97
RESIDENTIAL	CONSUMER PRODUCT REBATE FOR LIGHTING	$201,108,692.45
RESIDENTIAL	PRESCRIPTIVE HVAC	$172,263,060.18
RESIDENTIAL	WHOLE HOME RETROFIT	$136,793,948.24
RESIDENTIAL	WHOLE HOME AUDITS	$133,805,550.06
COMMERCIAL AND INDUSTRIAL	NEW CONSTRUCTION	$131,716,860.03
RESIDENTIAL	CONSUMER PRODUCT REBATE FOR APPLIANCES	$118,697,151.22
CROSS SECTOR	MARKETING, EDUCATION, OUTREACH	$89,432,500.76
COMMERCIAL	OTHER	$77,131,925.10
COMMERCIAL	SMALL COMMERCIAL PRESCRIPTIVE	$73,550,216.40
CROSS SECTOR	MARKET TRANSFORMATION	$71,570,293.60
RESIDENTIAL	WHOLE HOME DIRECT INSTALL	$71,157,821.43
RESIDENTIAL	APPLIANCE RECYCLING	$68,427,345.11
RESIDENTIAL	NEW CONSTRUCTION	$67,683,821.79
INDUSTRIAL	INDUSTRIAL OR AGRICULTURAL PROCESSES	$67,493,004.09
RESIDENTIAL	BEHAVIORAL, ONLINE AUDIT, FEEDBACK	$59,508,880.56
INDUSTRIAL	OTHER	$58,110,368.41
COMMERCIAL	PRESCRIPTIVE OTHER	$54,654,194.45
CROSS SECTOR	PLANNING, EVALUATION, OTHER PROGRAM SUPPORT	$53,012,418.64
RESIDENTIAL	MULTIFAMILY	$48,631,472.72
RESIDENTIAL	PRESCRIPTIVE OTHER	$47,355,111.93
CROSS SECTOR	CODES AND STANDARDS	$46,788,028.67
COMMERCIAL	CUSTOM RETROCOMMISSIONING	$37,400,140.95
COMMERCIAL	PRESCRIPTIVE LIGHTING	$36,322,740.68
COMMERCIAL	NEW CONSTRUCTION	$29,686,036.17

COMMERCIAL	SMALL COMMERCIAL CUSTOM	$26,579,756.18
COMMERCIAL	PRESCRIPTIVE HVAC	$22,747,522.14
COMMERCIAL AND INDUSTRIAL	AUDIT	$22,050,999.89
RESIDENTIAL	FINANCING	$20,305,002.00
COMMERCIAL	CUSTOM AUDIT	$17,111,939.00
INDUSTRIAL	PRESCRIPTIVE AGRICULTURE	$17,072,986.67
INDUSTRIAL	PRESCRIPTIVE MOTORS	$15,964,693.55
CROSS SECTOR	WORKFORCE DEVELOPMENT	$11,936,612.62
CROSS SECTOR	VOLTAGE REDUCTION, TRANSFORMERS	$10,685,503.00
COMMERCIAL	PRESCRIPTIVE GROCERY	$9,416,485.63
INDUSTRIAL	CUSTOM AUDIT	$9,293,226.63

Figure B-2 Canadian Electric Energy Efficiency Program Category Expenditures in USD

CUSTOMER CLASS	PROGRAM TYPE	2014 EXPENDITURES USD	2014 EXPENDITURES CAD
INDUSTRIAL	CUSTOM INDUSTRIAL OR AGRICULTURAL PROCESSES	$49,630,826.66	$44,955,906.86
CROSS SECTOR	OTHER	$41,150,442.90	$37,274,323.29
RESIDENTIAL	OTHER	$38,236,160.05	$34,634,548.04
COMMERCIAL	OTHER	$31,832,221.71	$28,833,821.45
COMMERCIAL	CUSTOM RETROCOMMISSIONING	$24,050,143.73	$21,784,767.54
INDUSTRIAL	OTHER	$18,993,532.09	$17,204,457.73
COMMERCIAL	PRESCRIPTIVE LIGHTING	$9,408,529.54	$8,522,303.70
LOW INCOME	LOW INCOME	$8,392,106.36	$7,601,621.35
COMMERCIAL	NEW CONSTRUCTION	$8,163,124.81	$7,394,208.47
RESIDENTIAL	CONSUMER PRODUCT REBATE FOR LIGHTING	$4,923,122.58	$4,459,394.59
RESIDENTIAL	APPLIANCE RECYCLING	$4,165,912.74	$3,773,509.29
RESIDENTIAL	CONSUMER PRODUCT REBATE FOR APPLIANCES	$3,666,696.67	$3,321,316.31
CROSS SECTOR	CODES AND STANDARDS	$2,962,741.87	$2,683,669.74
RESIDENTIAL	NEW CONSTRUCTION	$2,727,567.90	$2,470,647.71
RESIDENTIAL	BEHAVIORAL, ONLINE AUDIT, FEEDBACK	$2,509,170.41	$2,272,821.93
CROSS SECTOR	MARKETING, EDUCATION, OUTREACH	$925,886.43	$838,673.60
RESIDENTIAL	WHOLE HOME RETROFIT	$880,472.70	$797,537.57
COMMERCIAL	STREET LIGHTING	$877,184.55	$794,559.14
COMMERCIAL	PRESCRIPTIVE GROCERY	$820,029.46	$742,787.71
CROSS SECTOR	MARKET TRANSFORMATION	$478,887.29	$433,779.04
COMMERCIAL	PRESCRIPTIVE HVAC	$344,593.74	$312,135.12
RESIDENTIAL	PRESCRIPTIVE INSULATION	$324,029.50	$293,507.90
RESIDENTIAL	PRESCRIPTIVE HVAC	$313,818.34	$284,258.58

COMMERCIAL	GOVERNMENT, NONPROFIT, MUSH	$309,378.08	$280,236.56
RESIDENTIAL	MULTIFAMILY	$96,058.02	$87,009.95
CROSS SECTOR	MULTI-SECTOR REBATES	$72,676.84	$65,831.13
CROSS SECTOR	PLANNING, EVALUATION, OTHER PROGRAM SUPPORT	$72,676.84	$65,831.13
COMMERCIAL	PRESCRIPTIVE IT AND OFFICE EQUIPMENT	$14,250.12	$12,907.84
RESIDENTIAL	PRESCRIPTIVE WATER HEATER	$1,799.89	$1,630.35

Appendix C Electric Demand Response Program Expenditures

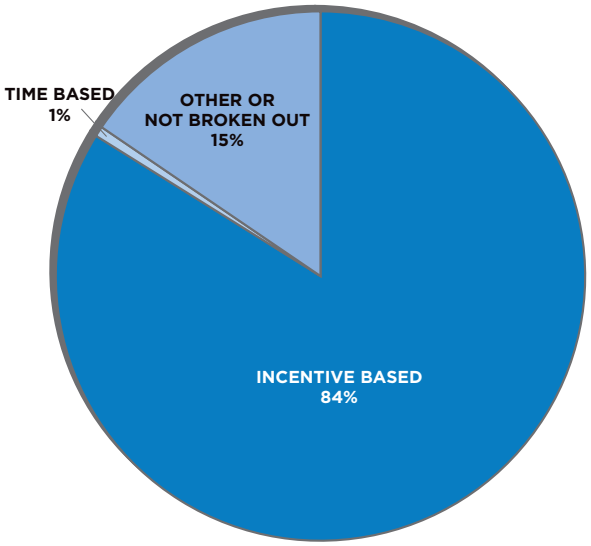
In 2013, CEE modified the demand response program categories in the survey to align with those used by FERC. FERC defines several demand response program types and groups them into two major categories described in general terms as follows:

- **Incentive programs** that address load control through a contractual agreement with the customer, usually offering rebates, rate discounts, or bill credits and possibly penalties for noncompliance.
- **Time based programs** that invite customers to participate. When the utility needs to reduce load during system peaks, it sends opt-in notifications and offers incentives such as graduated pricing schemes in exchange.

US Electric Demand Response Program Category Expenditures

Over four-fifths of 2014 demand response program expenditures went to incentive programs, as shown in Figure C-1.

Figure C-1 US Electric Demand Response Expenditures: General Categorization, 2014



Of those expenditures, two-fifths, 40 percent, went to interruptible load programs, followed by direct load control at 36 percent, emergency demand response at 11 percent, other incentive programs at 10 percent, and load as a capacity resource and demand bidding and buyback at two percent and one percent respectively.

Figure C-2 US Electric Demand Response Expenditures: Incentive-Based Programs, 2014

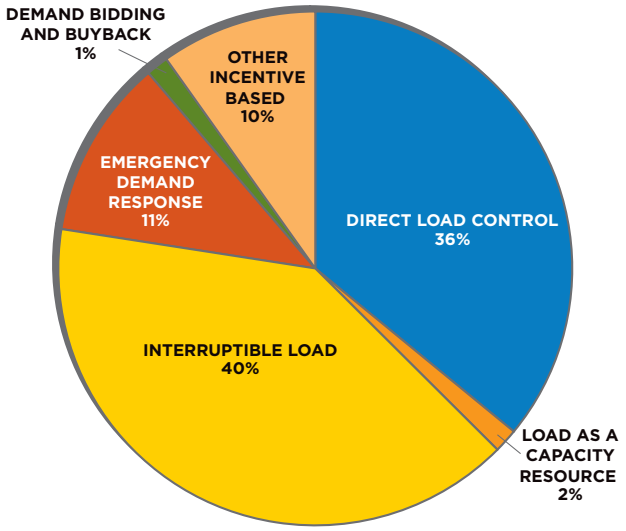
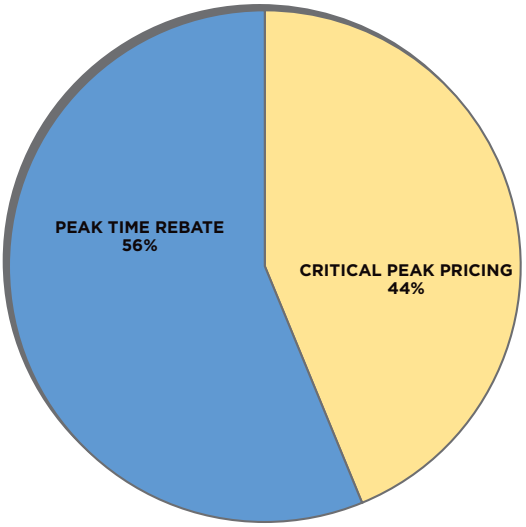


Figure C-3 US Electric Demand Response Expenditures: Time-Based Programs, 2014



Less than one percent of demand response expenditures went to time based programs. Figure C-3 shows that over half, 56 percent, of these expenditures went to peak time rebate programs, with the remainder going to critical peak pricing programs, 44 percent.

The spend allocated to other time based programs in 2013, including time of use pricing, critical peak pricing with load control, and real time pricing, was driven by individual program administrators that responded indicating a reallocation of expenditures to the programs above in 2014. While the incentive program breakdown is similar to 2013, the proportion of direct load control programs decreased significantly, as other incentive, emergency

demand response, and interruptible load programs took on a greater share of the total incentive spend.

In 2014, the percentage of demand response expenditures allocated to several time based program categories (time of use pricing, real time pricing, and "other" time based pricing) dropped to zero. After analyzing the data, CEE determined that the 2013 expenditures reported had been derived solely from a single respondent in each program category. Those respondents subsequently reallocated that funding in 2014.

Canadian Electric Demand Response Program Category Expenditures

In 2014, thanks to the submission from a large Canadian program administrator, CEE was able to provide a rough breakdown of demand response program expenditures into the high level FERC categories, however as this program administrator did not respond in 2015, such an analysis is not possible with this release. CEE will provide such a breakdown in future reports if the data affords the opportunity.

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