2012 State of the Efficiency Program Industry

BUDGETS, EXPENDITURES, AND IMPACTS

ANNUAL INDUSTRY REPORT

Consortium for Energy Efficiency

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PURPOSE AND LIMITATIONS

CEE collaborates with the American Gas Association (AGA) and IEE, an Institute of the Edison Foundation, to survey and collect data in the United States and Canada regarding energy efficiency and demand response industry budgets, expenditures, and savings for both the gas and electric programs. The objective of compiling these data is to annually complete an industry report and a separate set of appendices. Both the report and appendices provide a time series trend analysis and snapshot of the demand side management (DSM) industry on an annual basis. This purpose and data limitations clause is in reference to the report titled State of the Efficiency Program Industry Report.

The report documents electric and natural gas DSM program industry trends at the regional and national level in the United States and Canada based on data collected through a survey of DSM program administrators. The data are collected specifically for time series trend analysis, providing a point in time snapshot of the dollars budgeted and expended on DSM programs in both countries. CEE believes that using these data to analyze trends at the national and regional level accurately portrays the annual state of the industry. The limitations of the data are disclosed below.

There are many limitations to budget, expenditures, and savings data. First, these data are reported by an individual or group of individuals within each responding organization. Although CEE and our collaborators 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 with any third party. 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 collaborators have sought greater consistency in data collection from respondents over the years, however, the accuracy of the data are ultimately dependent upon each individual respondent’s interpretation of the survey questions and ability to retrieve the relevant information. Furthermore, variation in state policies and reporting requirements and inconsistent use of terms complicate our efforts.

Additional factors that tend to affect the viability of comparisons or analytical inferences include differences in regulatory structures, weather effects, customer demographic differences, electric and gas rates, the duration of program experience, and underlying interests given a particular program administrator model.

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 notes that when this information is used beyond the stated limits, reviewers are encouraged to inquire as to the sufficiency of the method or quality of supplemental data for the specified purpose.
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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 the extensive clarification and follow-up.

CEE would also like to thank the American Gas Association and IEE, an Institute of the Edison Foundation, which were once again major contributors to this year’s report. We use a common data instrument to eliminate multiple requests for the same information, as well as coordinate and share in data collection.

CEE also acknowledges the reviewers working in the field of energy efficiency who have provided informal feedback and insights on this work over the years. Reviewers include, but are not limited to, CEE members and staff of the American Council for an Energy-Efficient Economy, Natural Resources Canada, and the Energy Information Administration. Finally, a special thanks to Mariam Arnaout of the American Gas Association and Adam Cooper of IEE, an Institute of the Edison Foundation, for a fourth successful collaboration on this project. We welcome additional feedback from readers to help inform future reports.

This report was produced by Hilary Forster, Patrick Wallace, and Nicolas Dahlberg of the CEE Evaluation, Research, and Behavior team.
EXECUTIVE SUMMARY

This report reviews aspects of the state of the electric and gas demand side management (DSM) program industry in the United States and Canada. The report provides trends on 2011 program expenditures and reported savings along with 2012 budgets. The budget data collected represent the industry’s expected 2012 budget allocation at the time of the data collection. Currently, the primary purpose of these data is to produce trends that capture the state of the ratepayer-funded DSM program industry in the United States and Canada in a timely manner. In Section 2, full disclosure is provided concerning the limitations of these data.

This is the seventh annual industry data collection conducted by CEE, and the fourth year of collaboration with the American Gas Association (AGA) and IEE, an Institute of the Edison Foundation. Working with these organizations has streamlined data collection and increased the participation and response rate for this survey.

Every year, CEE and our collaborators aim to increase participation in the survey. This year CEE, with AGA and IEE, obtained data from 309 utility and nonutility program administrators operating efficiency programs in 47 states and seven Canadian provinces.2

Below are the key findings from this year’s industry data collection:

• US and Canadian combined gas and electric DSM program budgets reached $9.4 billion in 2012
• US and Canadian combined gas and electric DSM program expenditures reached $7.6 billion in 2011
• CEE member programs accounted for 80 percent of this total, or $6.1 billion
• US and Canadian gas and electric DSM program expenditures have increased by 17 percent, up from $6.5 billion in 2010
• US and Canadian energy efficiency programs saved approximately 40,000 GWh of electricity and 363 million therms of gas in 2011.3 This resulted in 30 million fewer metric tons of CO2 emissions from entering the atmosphere.
• Natural gas program expenditures in the United States and Canada topped the $1 billion mark for the first time at $1.1 billion, up from $914 million in 2010.
• Canadian gas and electric DSM program expenditures rose by 15 percent and inched closer to the $1 billion mark ($942 million USD, $931 million CAD) in 2011. In 2010, administrators spent $821 million ($791 million CAD) on demand side management programs.
• US and Canadian program administrators spent $1.1 billion on demand response programs in 2011, which was an increase of approximately $60 million over what was spent on demand response programs in 20104.

1 This year’s report again focuses on ratepayer-funded DSM programs only. Starting in 2013, CEE is considering expanding the data collection to report other sources of funding as well, such as Regional Greenhouse Gas Initiative (RGGI) auctions, forward capacity payments, and revenue from federal, state, or provincial sources.

2 CEE has adjusted the way we calculate the response rate from previous reports. For more details on this change, please see Section 2.1. Based on the revised methodology, we received information from 14 more respondents this year than last.

3 CEE adjusted the way we calculate savings values this year. For more information on this change, please see Section 5.

4 CEE adjusted some of the definitions for demand response programs in the survey this year. For more information on these changes, please see Section 3.3.3.
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1 Introduction

Energy efficiency and demand response programs, collectively referred to as demand side management (DSM) programs, present opportunities to save money for both businesses and consumers alike, as well as to reduce climate risks and stimulate economic growth. In such times of uncertainty in the energy industry and the global economy, energy efficiency and demand response offer opportunities to mitigate carbon emissions, reduce energy price volatility, and help boost job creation. Additionally, DSM programs allow energy producers and suppliers to invest in a lower risk and lower cost demand side resource. These factors indicate a fundamental change in resource planning and in program administrators’ strategic position within their organizations’ sustainability plans.

Energy efficiency and demand response have already helped to boost economic opportunities for new businesses focused on the production of new and highly efficient products or infrastructure development, as well as advancements in real-time metering, monitoring, and remote operation and signaling capabilities. Portals that enable communication with customers are offering the need for more marketing expertise to increase program participation and reach more segmented and specific energy customers. Most important, energy efficiency and demand response programs are offering the promise of a more efficient and cost-effective way of ensuring that energy supply can reliably meet demand in the United States and Canada.

This report uses data collected through a binational survey of US and Canadian electric and gas DSM program administrators. It looks retrospectively at 2011 expenditures and savings and at 2012 budgets at the time of the data collection. The data in this report represent only ratepayer-funded programs and are aggregated at the state or provincial, regional, and national levels.

The purpose of this report is to document trends in the electric and natural gas DSM industry in the US and Canada, with an emphasis on timely and increasingly comparable data. Nevertheless, there are limitations to the comparability and consistency of the data that reduce their analytical usefulness below the regional level. CEE clarifies the limitations of the data in Section 2, which outlines the reasons why the use of this information at any level—state, regional, national, or binational—should be limited to the intended purpose stated above. For more information on the purpose and limitations of these data, please refer to the Purpose and Limitations and Terms of Use statements on pages two and three of this report.

Collecting this information was made possible through the joint efforts of CEE and industry collaborators and by the contributions of all respondents to the survey. The data collected in this report are meant to supplement, and not replace, other DSM program reporting repositories and data collection efforts. For the purposes of this report, the terms “demand side management” or “DSM” refer to both energy efficiency and demand response programs, the term “energy efficiency” includes low income programs, and the term “demand response” refers to load response and price response programs, unless otherwise stated. Finally, the terms “savings” and “impacts” are used interchangeably.

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

6 These data were collected in the spring and summer of 2012.

7 CEE collaborators in this survey effort include the American Gas Association (AGA) and IEE, an Institute of the Edison Foundation. These relationships are further explained in Section 2.

8 For more information on what is included in the terms “load response” and “price response,” please see Section 3.3.3.
CEE has administered this survey annually to a variety of DSM program administrators including investor-owned utilities, nonutility program administrators, municipal power providers, and co-ops. In 2009, CEE began collaborating with AGA9 and IEE10 to provide the most current and comprehensive data available on the DSM program industry in the United States and Canada and to increase participation in the survey.

For the past seven years, this report has shown strong and consistent industry growth via three key indicators—budgets, expenditures, and savings. It is important to note, however, that there is not a one-to-one correlation between the growth of these indicators and growth of the industry. A key secondary factor behind the growth in budgets, expenditures, and savings in this report has been an increased number of respondents to the survey each year.

CEE estimates that as of 2011 and 2012, the number of survey participants now includes enough US and Canadian program administrators to comprehensively and accurately depict the industry’s size and trends, assuming all indicators are consistent, credible, and comparable. More information regarding the number of respondents to the survey in 2012 is available in Section 2.1 below.

There are a few other important considerations to keep in mind when interpreting the information in this report. First, as the number of survey respondents approaches the entire US and Canadian DSM industry, yearly changes in budgets, expenditures, and savings become less attributable to a change in the number of survey respondents and more attributable to actual industry trends. Thus, moving forward, the data should provide a more direct look at industry trends than they have prior to 2011. At the same time, the data will be more susceptible to changes or large swings directly tied to repeat participants. For example, if a large program administrator (where “large” implies large budget and expenditure dollars) responds to the survey in 2011 but not in 2012, yet is still administering programs in 2012, this can cause a noticeable downward swing in budgets, expenditures, and savings that may belie true industry trends. Although the occasional inability of large program administrators to participate was a concern prior to 2011, increases in participants obscured the variability caused by inconsistent reporting.

Another factor to consider is that the data collected in this report are not directly comparable across states, provinces, regions, or countries. This is because the terminology and practices in the DSM industry often vary widely across state, provincial, regional, and national boundaries. Despite these limitations, which are discussed at length in Section 2, CEE believes that the aggregate data and trends in this and past reports accurately depict continued robust investment, strong program spending, and a growing DSM program industry over time.

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9 The American Gas Association, founded in 1918, represents more than 200 local energy companies that deliver safe, reliable, and clean natural gas throughout the United States. There are more than 71 million residential, commercial, and industrial natural gas customers in the United States, of which 92 percent—more than 65 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 pipelines, marketers, gatherers, international natural gas companies, and industry associates. To find out more, please visit: [www.aga.org](http://www.aga.org).

10 IEE is an Institute of the Edison Foundation focused on advancing the adoption of innovative and efficient technologies among electric utilities and their technology partners that will transform the power grid. IEE promotes the sharing of information, ideas, and experiences among regulators, policymakers, technology companies, thought leaders, and the electric power industry. IEE also identifies policies that support the business case for adoption of cost-effective technologies. IEE members are committed to an affordable, reliable, secure, and clean energy future. IEE is governed by a Management Committee of 23 electric industry chief executive officers. IEE members are the investor-owned utilities who represent about 70 percent of the US electric power industry. IEE has a permanent Advisory Committee of leaders from the regulatory community, federal and state government agencies, and other informed stakeholders. IEE has a Strategy Committee of senior electric industry executives that identifies strategies and projects for IEE. IEE also has 22 smart grid technology company partners who share information about new technologies and practices and support IEE work. For more information, please visit: [www.edisonfoundation.net/iee](http://www.edisonfoundation.net/iee).
1.1 Report Structure

The 2012 State of the Efficiency Program Industry report is divided into five sections.

- **This section**, included under the heading of Introduction, provides an overview of the report’s scope and structure.

- **Section 2**, Data Collection Information 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 budgets and expenditures data and analysis of ratepayer-funded natural gas and electric DSM programs.

- **Section 4**, Evaluation, Measurement, and Verification, presents analysis of evaluation, measurement, and verification program expenditures.

- **Section 5** (the final section), called 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 segment.

Energy efficiency and demand response program expenditures and budgets are displayed by state and province in this report’s appendices. Energy savings are aggregated and reported at only the regional level for the United States and the national level for Canada. Savings data are not reported by state or province because of the risk of misinterpreting program cost-effectiveness and because of the many limitations to the savings data. For more information on these limitations, please see 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 contact Sarah Griffith, CEE Strategic Communications Director, at reports@cee1.org or visit cee1.org. For members, the report will be posted in the CEE Forum.

Context is necessary to properly interpret the results of this report. The section below is dedicated to providing context regarding participant response rates, program funding, participant engagement, reporting period, program categories, exchange rate information, and the limitations of the data in this report.
2 Data Collection Information and Limitations

CEE collected data throughout the spring and summer of 2012 in conjunction with AGA and IEE. The survey frame included previous survey respondents, all member organizations of AGA, IEE, and CEE11, and nonmembers who submitted data to the Energy Information Administration (EIA) and who were expected to have significant DSM programs.12 Because the DSM industry is constantly changing, it is difficult to identify and survey every program. CEE attempted, however, to make its sample frame as comprehensive as possible.

CEE, with support from IEE, collected all electric program data. CEE and AGA together collected gas program data, with AGA collecting the majority of the information. CEE only collected information on gas efficiency programs if they were a statewide program administrator, not a member of AGA, or if AGA and CEE decided together that CEE should collect certain information on a case-by-case basis.

AGA and IEE were major contributors to this year’s report. Collaborating with these organizations has streamlined data collection and expanded the sample pool of program administrators in the United States and Canada. AGA and IEE publish additional information on DSM programs, including a summary of budgets and expenditures as reported here, energy savings data, information on program implementation and evaluation, and regulatory information. These organizations may be contacted directly for more on their publications, which are also publicly available on their websites.

2.1 Response Rates

This is a voluntary survey that is administered annually 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, the changes from year to year in the data reported here cannot be entirely attributed to new or expanded programs and new program administrators.

In some cases, where CEE knew that there were electric programs with relatively significant budgets yet no survey response, we used secondary public data filings to obtain basic information on budgets, expenditures, and savings. CEE also supplemented partial responses to the survey with public filings and with data from the Energy Information Agency. Finally, CEE estimated the budgets, expenditures, and savings of large program administrators based on previous responses to the survey when we didn’t receive a response from the administrator and when secondary information was not available.

Finally, CEE adjusted the way we calculated the number of respondents to the survey this year. “Respondents” in this report include organizations that provided CEE, AGA, and IEE with data directly or that CEE collected information about through public filings. In previous years, CEE included survey participants whose ratepayer dollars were used to administer statewide programs.

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11 CEE members are comprised of electric and gas efficiency program administrators from across the United States and Canada. For more information on CEE membership please visit: http://www.cee1.org/content/members.

12 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 46 million Americans. For more information about APPA or their members, please visit: www.publicpower.org.
efficiency programs, but who do not administer efficiency program directly. However these organizations were not included in the count of responses to the survey this year because CEE limited the definition of “respondent” to those organizations that administer DSM programs within their service territory. CEE also decided to only include information from secondary sources if budgets, expenditures, and savings information were all available. For example, CEE previously used information from an annual report published by the California Municipal Utilities Association called Energy Efficiency in California’s Public Power Sector, but decided against using the information this year because it only contained expenditures and savings information, and not budgets. These changes resulted in fewer respondents to the survey than CEE has reported in previous years. That being said, the changes to what CEE considers a respondent and to what kinds of secondary information we used, had a negligible effect on the overall findings of this report.

Every year, through outreach and collaboration, CEE aims to increase participation in the survey. This year, CEE together with AGA and IEE obtained data from 309 utility and nonutility program administrators operating DSM programs in 47 states and seven Canadian provinces. If CEE had used the revised methodology explained in the paragraph above last year, there would be 14 more respondents this year than last year. Finally, only a few known large DSM program administrators did not provide data to CEE or AGA this year. Therefore, CEE concludes that the vast majority of large demand side management program administrators are represented in this report.

2.2 Funding Sources

All electric and natural gas DSM program funding reported here is from ratepayers through public benefits charges or other rate funding mechanisms. Some additional program funding, not included in this report, originates from sources other than ratepayers. This includes, but is not limited to, funding from the Regional Greenhouse Gas Initiative (RGGI), the New England Forward Capacity Market, state or federal agencies, and the American Recovery and Reinvestment Act (ARRA). In next year’s report, CEE may include RGGI and New England Forward Capacity Market funds assuming that the proceeds from these sources are allocated back into DSM portfolios.

2.3 Reporting Period

CEE asked respondents to provide program expenditures and savings data for the 2011 calendar year and budgets for the 2012 calendar year by customer class. Not all program administrators’ program or fiscal years match the calendar year. In some cases, data may reflect program or fiscal year information rather than calendar year data. In some other cases, budget data may reflect multiyear figures that represent the total budget for the entire approved portfolio cycle. CEE has already begun working to ensure that budget figures for a program cycle will not be used in this report in future years.
2.4 Reporting Categories

The categories “commercial and industrial,” “residential,” “demand response,” “low income,” and “EM&V” are used in this report because they are both common and straightforward, but not all programs use these exact categories in the same ways. In particular, the contents of the “other” category vary by state and province. “Other” includes items that some program administrators may not allocate by sector such as administration, advertising, agriculture, codes and standards, education and training, general support, planning, research and development, and any program budgets or expenditures that are not allocable by customer class.

Some respondents were not able to separate low income program dollars from residential program funds, and a small number of commercial program dollars were combined with residential program funds. Finally, some respondents did not break their budgets, expenditures, or savings out into the categories listed above and instead only submitted total figures. Given that respondents may interpret survey questions differently, or may leave certain questions blank, expenditures, budgets, and savings data should be regarded as estimates rather than exact figures.

The low income data understate what states and provinces budget for low income programs because many low income weatherization programs receive significant amounts of federal funding and are run by state or provincial agencies not included in this report. For this reason, the category should be considered as representing only ratepayer-funded low income programs, and the data provided to CEE may differ from other published information about the efforts of particular program administrators. Because of the caveats mentioned above, CEE is planning to take steps in future surveys to try to limit the variability in the reporting categories.

2.5 Other Data Limitations

CEE makes every attempt to collect data that are consistent with the definitions and data requirements outlined in the survey instrument. When staff identifies outlying values in the data, we contact respondents and work with them to obtain accurate information.

While reviewing inconsistencies in the data, CEE realized that some program administrators reported budgets for entire multiyear program cycles instead of the annual or individual year budgets that were requested in the survey. The primary reason for this is because for some program administrators running programs on multiyear cycles, a multiyear budget could be spent at any time during the cycle. Therefore, some program administrators reported their entire remaining portfolio budget as their annual approved budget in the survey. Although CEE understands this reporting perspective, budget data may have overstated annual budgets when compared across years.

In a different example, an overstated 2011 budget resulted in a significant discrepancy between 2011 budgets and actual 2011 expenditures for a specific region of the United States. CEE attempted to adjust these numbers down to the appropriate program year when the program administrator could not provide an annual budget figure. CEE staff has planned a number of improvements to the survey for 2013 that should reduce these data inconsistencies.

13 See Figure 7 and the accompanying footnote for more details.
Another factor that contributes to the uncertainty of the budget data is that budgets represent a snapshot at the time the data are collected, whereas expenditures and savings are reported for the previous year. Therefore, changes to program budgets after the summer of 2012, such as those due to newly approved programs or budget cuts, are not reflected in these data. Also, some dollars reported in 2012 represent carryover of unspent funds from 2011, leading to double or multiyear counting of budget figures.

For the reasons above, CEE will focus primarily on expenditures rather than budgets as the best indicator of the industry’s size in this report.

There are numerous reasons why the data—particularly the savings data—presented in this report may not be comparable 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; and differences in the focus or goals of programs, which often affect which performance data are tracked and how they are reported. For example, program administrators make different assumptions about appropriate cost-benefit tests, net-to-gross factors, savings equations, avoided transmission and distribution system line losses, and measure persistence. These differing assumptions can lead to the aggregation of data that have received significantly different treatment under umbrella terms such as “net savings,” and context is therefore extremely important when analyzing this information. CEE believes that for these reasons, savings data in particular should only be aggregated at the census region level in the United States and at the national level in Canada.

### 2.6 Currency Conversions

For ease of reading, all currency is reported in US dollars (USD) unless otherwise specified. This report uses the 2011 average annual J.P. Morgan Spot Exchange Rate of 1.011 USD = 1 CAD for the 2011 expenditure information and the 2012 average annual J.P. Morgan Spot Exchange Rate through September 6, 2012 of 0.9954 USD = 1 CAD for the 2012 budget information. For prior years, only one conversion factor was used for both expenditure and budget information. The following exchange rates were used previously: 1.037 USD = 1 CAD for 2011 budget and 2010 expenditures, 0.9544 USD = 1 CAD for 2010 budgets and 2009 expenditures, 0.9339 USD = 1 CAD for 2009 budgets and 2008 expenditures, 0.9345 USD = 1 CAD for 2008 budgets (no expenditures in this report), and 1 USD = 1 CAD for 2007 budget values (no expenditures in this report).
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 reached $9.4 billion in 2012. As Figure 1 illustrates, budgets for DSM programs continue to increase despite a weak economy since 2008.

![Figure 1: US and Canadian DSM Program Budgets 2008–2012](image)

3.2 Combined DSM Expenditures in the United States and Canada

Across the United States and Canada, reporting program administrators spent $7.6 billion on gas and electric DSM program expenditures in 2011, an increase of more than $1 billion over the $6.5 billion they collectively spent in 2010 (Figure 2). For those who responded to the survey in 2011 and 2012, this represents a 15 percent increase in electric spending and a 24 percent increase in gas spending.

![Figure 2: US and Canadian DSM Program Expenditures 2008–2011](image)
3.3 United States DSM Trends

In 2011, US administrators spent about $6.7 billion for gas and electric DSM programs combined (Figure 3). This is an increase of approximately $1 billion from 2010 to 2011 and an increase of nearly $3 billion since 2008.

In 2012, natural gas and electric DSM program administrators in the United States budgeted $8.3 billion for energy efficiency and demand response, an increase of almost $300 million over the $8.0 billion that was collectively budgeted by these administrators in 2011.

3.3.1 United States Electric DSM Expenditures Trends

In 2011, US administrators spent about $5.7 billion for electric DSM programs (Figure 4). This is a 19 percent increase from 2010 to 2011 and a 68 percent increase since 2008.
FIGURE 5 shows how DSM expenditures were allocated by customer class. 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. Data from those respondents are grouped into the “Not Broken Out” category in Figure 4 but are not included in either Figure 5 or the remaining US electric charts that present spending or savings by customer class. Those charts only provide information on the dollars that were broken out into the categories below.

Data continue to show that commercial and industrial efficiency programs receive the largest share of electric program funding, followed by residential efficiency, demand response, and low income programs. Administrators allocated an average of 13 percent of their total program budgets to “other,” which includes programs not otherwise allocable by customer class such as administration, market research, planning and development, pilot programs, marketing and outreach, education, and evaluation, measurement, and verification.

3.3.2 United States 2011 Electric Expenditures vs. 2011 Reported Budgets

This year CEE sought to understand the dollars spent on US electric energy efficiency programs in 2011 in relation to the 2011 budget estimates from the previous year.

<table>
<thead>
<tr>
<th></th>
<th>2011 BUDGETS (LAST YEAR’S REPORT)</th>
<th>2011 EXPENDITURES (THIS YEAR’S REPORT)</th>
<th>PERCENT DIFFERENCE</th>
<th>ABSOLUTE DIFFERENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5,496</td>
<td>4,522</td>
<td>21.5%</td>
<td>974</td>
</tr>
</tbody>
</table>

Notes: *This table includes only those organizations who responded to the survey in both 2011 and 2012. Values above are approximate.

Overall, the 2011 budgets reported in last year’s survey were higher than the 2011 expenditures reported in this year’s survey (FIGURES 6 AND 7). Reasons for this discrepancy are discussed at length in Section 2.5 of this report.
In the Midwest and West census regions, 2011 budgets were fairly close to 2011 expenditures, however in the Northeast and South there were substantial differences (Figure 7).

\[ \text{Figure 7} \] US Electric DSM Program Budgets vs. Expenditures by Region 2011

### 3.3.3 United States Electric Demand Response

Once again, CEE collected data on demand response (DR) budgets and expenditures for electric DSM program administrators. This year, CEE emphasized to respondents that the survey only asked for ratepayer funded demand response programs that are administered by utilities and program administrators, and to please exclude programs that were administered by independent system operators (ISOs) or regional transmission organizations (RTOs). CEE also altered the definitions for demand response programs this year and fit them into two categories—load response and price response.

Price response programs involve a voluntary response to price signals. In such programs, end users reduce consumption during periods of high wholesale prices and typically receive the market rate for the avoided energy they provide via their demand reduction. Generally, these resources are not firm because participants react to economic price changes in the energy market.

Load response programs are primarily used for emergency or reliability purposes and are typically not voluntary. Generally, participants receive a payment for being available, known as a capacity payment ($/kW), and are typically compensated for their demand reductions during load reduction events with an additional energy payment ($/kWh). Typically, penalties are involved for nonperformance.

CEE defines load response programs as those programs that contain direct load control, curtailable load, interruptible load, scheduled load, or other load response mechanisms. CEE defines price response programs as those programs that contain time-of-use pricing, critical peak pricing, real-time pricing, or other price response mechanisms.

14 The difference in the Northeast region can be attributed to some program administrators in the region having difficulty reporting their 2011 budget on an annual basis.

15 These terms come from the Rocky Mountain Institute, Demand Response: An Introduction, April 30, 2006. [http://www.sgiclearinghouse.org/LessonsLearned?q=node/2440&lb=1](http://www.sgiclearinghouse.org/LessonsLearned?q=node/2440&lb=1). For more information on these terms, please refer to this report.
US electric demand response expenditures totaled $967 million in 2011. The southern United States continues to invest heavily in demand response, representing 35 percent of the region’s total 2011 efficiency program expenditures. The West continues to invest in demand response as well, representing 20 percent of their total expenditures in 2011 (FIGURE 8).

The South and West have notably large demand response expenditures compared to total DSM expenditures (35 and 20 percent, respectively). In a 2009 report, the Federal Energy Regulatory Commission (FERC) found that the three southern census divisions and one western census division have the highest demand response potentials under a “full participation” scenario, primarily because “hotter regions with high central air-conditioning saturations…could achieve greater average per customer impacts from [direct load control] and dynamic pricing programs.” Under a “business as usual” scenario, FERC found that regions with functioning wholesale markets—particularly the middle Atlantic (PJM) and New England (NE-ISO)—have the highest demand response potential, though their comparatively low air-conditioning load hampers cost-effective deployment of connected technologies. Bloomberg New Energy Finance notes that in the SERC Reliability Corporation region, which covers roughly two of the southern census divisions, “demand response potential derives from significant industrial activity, a high concentration of urban load [centers], and a hot climate” and that already in 2011, “interruptible load currently [made] up 60-70 percent of SERC’s demand response profile.” These regional differences in climate and load characteristics likely explain the comparatively large demand response investment evident in the South and West.

This year, CEE sought to better understand demand response programs not only by category and type, but also by region. The data show that 57 percent of electric survey respondents who provided information on energy efficiency expenditures this year also provided expenditures on DR programs. Out of this pool of respondents, 77 percent broke their DR programs into price response and load response categories.

The vast majority of the demand response program expenditures were spent on load response programs (FIGURE 9). Direct load control programs were the most common demand response program in the United States, followed by curtailable load and interruptible load programs, respectively (FIGURE 12). More than half of the program administrators in the Midwest ran direct load control programs, and nearly half of the program administrators in the South ran curtailable load programs. Scheduled load programs were the least common with only two programs being administered in the West census region. (FIGURE 12).

Direct load control programs made up a majority of the dollars spent on load response programs followed by interruptible load, curtailable load, and other load response programs. Scheduled load programs made up less than one half of one percent of total load response program spending in 2011 (FIGURE 10).
Critical peak pricing made up a majority of the dollars spent on price response programs followed by other price response programs and real time pricing. Time-of-use pricing made up less than one half of one percent of the total price response program spending in 2011 (FIGURE 11).

The majority of program administrators in the United States indicated that they did not run price response programs, however of those that did, time-of-use pricing programs were the most common (FIGURE 13). Please note that not all program administrators provided information on their types of DR programs as explained in the beginning of this section.

A large number of program administrators reported that they didn’t administer any kind of demand response programs. CEE is planning in future surveys to collect more data on program administrators’ DR programs, as well as cross-check demand response expenditures with EIA information.
Figure 13  US Electric Price Response Expenditures by Program Type and by Region  2011

<table>
<thead>
<tr>
<th>Region</th>
<th>No.</th>
<th>%</th>
<th>No.</th>
<th>%</th>
<th>No.</th>
<th>%</th>
<th>No.</th>
<th>%</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northeast</td>
<td>1</td>
<td>3%</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
<td>28</td>
<td>80%</td>
</tr>
<tr>
<td>Midwest</td>
<td>11</td>
<td>23%</td>
<td>3</td>
<td>6%</td>
<td>3</td>
<td>6%</td>
<td>2</td>
<td>6%</td>
<td>31</td>
<td>65%</td>
</tr>
<tr>
<td>South</td>
<td>15</td>
<td>35%</td>
<td>4</td>
<td>9%</td>
<td>3</td>
<td>7%</td>
<td>0</td>
<td>0%</td>
<td>23</td>
<td>53%</td>
</tr>
<tr>
<td>West</td>
<td>8</td>
<td>19%</td>
<td>4</td>
<td>9%</td>
<td>2</td>
<td>5%</td>
<td>3</td>
<td>9%</td>
<td>32</td>
<td>74%</td>
</tr>
<tr>
<td>United States</td>
<td>35</td>
<td>21%</td>
<td>11</td>
<td>7%</td>
<td>8</td>
<td>5%</td>
<td>5</td>
<td>4%</td>
<td>114</td>
<td>67%</td>
</tr>
</tbody>
</table>

Notes: “Number” represents the number of program administrators running the type of program listed above. “Percentage” represents the percentage of program administrators in each region that are running each type of program.

3.3.4 United States Natural Gas Expenditure Trends

Natural gas energy efficiency program expenditures in the United States continued to increase in 2011 (FIGURE 14). This year, reporting administrators spent $958 million on gas efficiency programs. In 2010, US administrators spent about $838 million on gas efficiency programs, up from approximately $803 million in 2009.
Residential energy efficiency programs comprised the largest percentage of 2011 gas program expenditures at 45 percent, followed by commercial and industrial programs at 24 percent, and low income programs at 22 percent (FIGURE 15). “Other” programs comprised 9 percent of the total efficiency program expenditures and included evaluation, measurement, and verification activities as well as programs that were not otherwise allocable by customer class.

In 2011, Canadian electric and gas expenditures reached $942 million ($931 million CAD). This is a 15 percent increase\(^8\) from reported 2010 program expenditures and an 83 percent increase over reported 2008 program expenditures (FIGURE 16).

In 2012, reporting natural gas and electric DSM program administrators in Canada budgeted $1.1 billion ($1.1 billion CAD) on energy efficiency and demand response, which is roughly the same as what was budgeted in 2011.

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\(^8\) Growth rates are calculated using US dollars.
3.4.1 Canadian Electric DSM Expenditure Trends

Canadian electric program expenditures climbed to $838 million ($829 million CAD) in 2011, which is a 12 percent increase from 2010 (FIGURE 17). In 2010, Canadian electric administrators spent $745 million ($718 million CAD); up from the $615 million ($644 million CAD) they spent on these programs in 2009.

As noted in Section 2.4, respondents to the survey may interpret the categories differently, and not every respondent separated their information by customer class. Data from those respondents are grouped into the “Not Broken Out” category in Figure 17 but are not included in either Figure 18 or the remaining Canadian electric charts that present spending or savings by customer class. Those charts only provide information on the dollars that were separated into the categories below.

Commercial and industrial programs received the largest share, 42 percent, of 2011 electric program expenditures in Canada (FIGURE 18). This is followed by demand response programs at 29 percent, residential programs at 17 percent, and low income programs at three percent. “Other,” which includes evaluation, measurement, and verification and programs not otherwise allocable by customer class, comprised nine percent of total 2011 electric DSM program expenditures.
3.4.2 Canadian 2011 Electric Expenditures vs. Reported Budgets

Similar to the comparison between 2011 US electric energy efficiency expenditures and 2011 budgets, 2011 Canadian electric budgets were higher than 2011 expenditures reported in this year’s survey (Figures 19 and 20). As discussed earlier, Section 2.5 of this report discusses possible reasons for this difference.

<table>
<thead>
<tr>
<th>Year</th>
<th>Budgets</th>
<th>Expenditures</th>
<th>Percent Difference</th>
<th>Absolute Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>918</td>
<td>656</td>
<td>39.9%</td>
<td>262</td>
</tr>
</tbody>
</table>

Notes: *This table includes only those organizations who responded to the survey in both 2011 and 2012. Values above are approximate.

<table>
<thead>
<tr>
<th>Year</th>
<th>Budgets</th>
<th>Expenditures</th>
<th>Percent Difference</th>
<th>Absolute Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>885</td>
<td>649</td>
<td>36.4%</td>
<td>236</td>
</tr>
</tbody>
</table>

Notes: *This table includes only those organizations who responded to the survey in both 2011 and 2012. Values above are approximate.

3.4.3 Canadian Electric Demand Response

The Canadian electric program administrators that responded to this survey spent $178 million ($176 million CAD) on their demand response programs in 2011, which accounted for 21 percent of their total electric DSM expenditures. The percentage spent on demand response programs is similar to the percentage that the western United States spent on demand response, and similar in absolute terms to the amount that was spent by program administrators in the Midwest (Figure 21).
CEE is unable to break out the demand response spending in Canada into load response and price response categories because we only received demand response expenditure figures from two Canadian program administrators. Of the two program administrators that provided values for demand response, one provided only their total dollars spent on demand response.

### 3.4.4 Canadian Natural Gas Expenditure Trends

Natural gas program expenditures topped $100 million ($104 million USD, $103 million CAD) for the first time in 2011 after showing slow growth the previous year and flat growth the two years before that. The largest portion of the growth comes from the commercial and industrial sectors, which grew by 67 percent since 2010. Since 2008, Canadian gas expenditures have grown 55 percent (FIGURE 22). In 2010, reporting Canadian program administrators spent $76 million ($73 million CAD) on natural gas efficiency programs, up from $67 million in 2008 and 2009 ($71 million and $70 million CAD, respectively).
Commercial and industrial programs accounted for 46 percent of total Canadian natural gas efficiency program expenditures, followed by residential programs with 14 percent, and low income programs with 12 percent. “Other” accounted for 28 percent of the total efficiency program expenditures and includes evaluation, measurement, and verification, as well as programs that are not otherwise allocable by customer class (FIGURE 23).

Commercial and industrial programs increased their share of total Canadian gas spending from 37 percent in 2010 to 46 percent in 2011.

![Figure 23: Canadian Gas Program Expenditures by Customer Class 2011](image)

4 Evaluation, Measurement, and Verification

CEE, with AGA and IEE, asked respondents to report spending on Evaluation, Measurement, and Verification (EM&V) in 2011 and the amount budgeted for EM&V in 2012. Please note that the tables below (FIGURES 24 AND 25) include only those programs that reported a dollar figure for their EM&V expenditures or budgets.

Based on total energy efficiency expenditures, 72 percent of US and Canadian electric efficiency administrators provided a separate dollar figure for their EM&V activities in 2011.19

![Figure 24: US and Canadian Electric EM&V Expenditures (Millions USD)* 2011](image)

<table>
<thead>
<tr>
<th>Country</th>
<th>EM&amp;V Expenditures</th>
<th>Total Energy Efficiency Expenditures</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>82</td>
<td>3,504</td>
</tr>
<tr>
<td>Canada</td>
<td>10</td>
<td>381</td>
</tr>
<tr>
<td>Total</td>
<td>92</td>
<td>3,885</td>
</tr>
</tbody>
</table>

Notes: *This table includes only those programs that provided a separate EM&V expenditure figure in the survey. Those respondents who did not provide a separate EM&V expenditure figure were excluded. Therefore, the totals shown here do not equal the total shown earlier in the report, which includes all respondents.

Based again on total energy efficiency expenditures, 78 percent of US and Canadian gas efficiency program administrators provided a separate dollar figure for their EM&V activities in 2011.

19 These expenditures exclude demand response because CEE did not ask for EM&V expenditures and budgets in the demand response portion of the survey.


### Figure 25 US and Canadian Gas EM&V Expenditures (Millions USD)*

<table>
<thead>
<tr>
<th>COUNTRY</th>
<th>EM&amp;V EXPENDITURES</th>
<th>TOTAL ENERGY EFFICIENCY EXPENDITURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>15</td>
<td>752</td>
</tr>
<tr>
<td>Canada</td>
<td>2</td>
<td>75</td>
</tr>
<tr>
<td>Total</td>
<td>17</td>
<td>827</td>
</tr>
</tbody>
</table>

**Notes:** *This table includes only those programs that provided a separate EM&V expenditure figure in the survey. Those respondents who did not provide a separate EM&V expenditure figure were excluded. Therefore, the totals shown here do not equal the total shown earlier in the report, which includes all respondents.*

Finally, based on the data in Figures 24 and 25, EM&V expenditures made up between two and three percent of the total amount spent on energy efficiency in 2011.

Not all respondents allocate funding for evaluation purposes on an annual basis. Other respondents simply didn’t fill out this portion of the survey. Out of the US participants that provided program expenditures, 74 percent provided information on EM&V expenses. Similarly, out of the Canadian participants that provided program expenditures, 58 percent provided EM&V expenses. Furthermore, because evaluation and its related program expenditures do not necessarily occur in the same time frame, caution is urged when comparing program expenditures to expenditures allocated for EM&V activities.

## 5 Estimated Program Savings and Environmental Impacts

CEE collected data on energy efficiency savings from gas and electric program administrators in 2011. In order to help respondents report their savings consistently across states and provinces, CEE used the Energy Information Administration’s (EIA) definitions of annual and incremental savings.

According to the EIA Form EIA-861, incremental savings include all energy savings that accumulated from new participants in existing programs and all participants in new programs in 2011. Annual savings are defined as all energy savings that accumulated during calendar year 2011 (1) from participation in new programs implemented in 2011, (2) from new participation in existing programs, and (3) from existing participation in previously implemented programs (including those terminated since 1992). We asked respondents to consider the useful life of efficiency measures by accounting for building demolition, equipment degradation, and program attrition when calculating annual effects. CEE also used a term called “annualized savings” in the survey. For the purposes of this report, annualized savings are defined as all energy savings that accumulated only during calendar year 2011 from existing participation in previously implemented programs. The purpose of including this definition was to make it clearer to survey participants what we were asking for in the survey. Annual savings figures were then determined by adding together incremental and annualized savings values.

CEE collected four different categories of savings values in the survey: net annual savings,
Over the past few years, CEE has noticed that many organizations haven’t been able to provide annual savings figures. Therefore CEE adjusted how we reported the savings figures this year. We produced three tables each for electric and gas savings: a table that focuses on incremental savings only, one that focuses on annualized savings only, and one that adds incremental and annualized savings together to get annual savings. In all tables, CEE intended to only aggregate gross savings figures, but because gross savings values weren’t always reported in the survey, net savings were used where gross savings were not available. In the future, CEE hopes to obtain at least gross incremental savings figures from all respondents.

In previous years, CEE made one table for electric savings and one table for gas savings which combined the different categories of savings information together. Also, we focused on net savings instead of gross savings. Therefore, changes in methodology, as described above, have resulted in tables that are not comparable to the savings tables we have published in the past.

We are emphasizing the gross incremental savings results this year because based on conversations with survey participants, gross incremental savings 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 have the fewest assumptions embedded in them. In addition, gross savings are the most useful metric for energy system planners because they include all of the savings that occur regardless of whether or not they were directly caused by the particular program being evaluated. Net savings, on the other hand, are often used by evaluators and regulators to measure against savings goals or to plan subsequent programs because they include only those savings that were a direct result of the program being evaluated. In the future, CEE plans to ask survey respondents for incremental savings and lifetime savings figures and to stop asking for annualized savings. This update is consistent with planned changes to Form EIA 861 in 2014 and reflects the industry’s focus on future, rather than past, savings.

CEE worked closely with our collaborators, AGA and IEE, to collect savings information from survey participants. In some cases, AGA and IEE have elected to display the savings data collected jointly through this effort differently from how CEE has chosen to display them. For more information on what AGA and IEE have published specifically and why, please refer to their reports that are publically available on their websites.

Finally, although CEE worked with respondents to ensure that savings data were reported as consistently as possible, many organizations calculate and report savings according to reporting requirements in their states or provinces, which may or may not be consistent with EIA definitions. Not all organizations were able to adjust their estimates to reflect EIA definitions. In addition, EIA definitions may be treated differently in different jurisdictions because each jurisdiction has its own reporting requirements that contain different embedded assumptions. Finally, because of 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.

---

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

22 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.
5.1.1 Electric Program Savings

Ratepayer-funded energy efficiency programs are saving energy and reducing the amount of greenhouse gases emitted in the United States and Canada. Reporting electric efficiency programs in the United States and Canada estimated incremental savings of approximately 40,000 GWh of electricity in 2011 (Figure 26). This is equivalent to roughly 28 million metric tons of avoided CO$_2$ emissions. CEE member programs accounted for 85 percent of these estimated savings.

Electric efficiency program administrators that reported an annualized savings figure estimated savings of approximately 93,000 GWh of electricity in 2011 (Figure 27). Seventy percent of respondents in the United States and Canada reported a figure for annualized savings.

---

**Figure 26 Estimated Gross Incremental Electric Energy Savings (GWh)**

<table>
<thead>
<tr>
<th>2011</th>
<th>RESIDENTIAL</th>
<th>LOW INCOME</th>
<th>C &amp; I</th>
<th>OTHER</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northeast</td>
<td>1,952</td>
<td>127</td>
<td>2,494</td>
<td>973</td>
<td>6,001</td>
</tr>
<tr>
<td>Midwest</td>
<td>2,475</td>
<td>76</td>
<td>2,631</td>
<td>708</td>
<td>6,877</td>
</tr>
<tr>
<td>South</td>
<td>1,434</td>
<td>112</td>
<td>1,485</td>
<td>8</td>
<td>3,108</td>
</tr>
<tr>
<td>West</td>
<td>8,259</td>
<td>326</td>
<td>10,334</td>
<td>1,520</td>
<td>20,611</td>
</tr>
<tr>
<td>Subtotal, United States</td>
<td>14,121</td>
<td>640</td>
<td>16,944</td>
<td>3,209</td>
<td>36,596</td>
</tr>
<tr>
<td>Canada***</td>
<td>469</td>
<td>36</td>
<td>1,364</td>
<td>632</td>
<td>3,694</td>
</tr>
<tr>
<td>Binational Total</td>
<td>14,590</td>
<td>677</td>
<td>18,308</td>
<td>3,841</td>
<td>40,289</td>
</tr>
</tbody>
</table>

Notes: The numbers in the sector categories don’t always add up to the total because some respondents only provided a total and didn’t break out their information by sector.

* Based on estimated 2011 savings from all energy savings that accumulated from new participants in existing programs and all participants in new programs in 2011. (gross incremental effects)

** Ninety-five (95) percent of all survey respondents in the US reported a value for incremental savings. Of those that reported a value for incremental savings, eighty-four (84) percent of respondents reported gross incremental effects. For respondents that did not report gross incremental effects, CEE used net incremental effects in calculating totals.

*** Ninety (90) percent of all survey respondents in Canada reported a value for incremental savings. Of those that reported a value for incremental savings, seventy (70) percent of respondents reported gross incremental effects. For respondents that did not report gross incremental effects, CEE used net incremental effects in calculating totals.

---

**Figure 27 Estimated Gross Annualized Electric Energy Savings (GWh)**

<table>
<thead>
<tr>
<th>2011</th>
<th>RESIDENTIAL</th>
<th>LOW INCOME</th>
<th>C &amp; I</th>
<th>OTHER</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northeast</td>
<td>4,442</td>
<td>304</td>
<td>7,859</td>
<td>44</td>
<td>12,644</td>
</tr>
<tr>
<td>Midwest</td>
<td>3,926</td>
<td>58</td>
<td>10,822</td>
<td>2,321</td>
<td>17,588</td>
</tr>
<tr>
<td>South</td>
<td>4,854</td>
<td>167</td>
<td>3,880</td>
<td>2,176</td>
<td>11,116</td>
</tr>
<tr>
<td>West</td>
<td>9,901</td>
<td>341</td>
<td>24,769</td>
<td>4,451</td>
<td>39,460</td>
</tr>
<tr>
<td>Subtotal, United States</td>
<td>23,122</td>
<td>870</td>
<td>47,330</td>
<td>8,992</td>
<td>80,808</td>
</tr>
<tr>
<td>Canada***</td>
<td>2,927</td>
<td>79</td>
<td>4,815</td>
<td>1,419</td>
<td>12,116</td>
</tr>
<tr>
<td>Binational Total</td>
<td>26,049</td>
<td>948</td>
<td>52,145</td>
<td>10,411</td>
<td>92,924</td>
</tr>
</tbody>
</table>

Notes: The numbers in the sector categories don’t always add up to the total because some respondents only provided a total and didn’t break out their information by sector.

---

Based on estimated 2011 savings from measures installed as early as 1992 that were still generating savings as of 2011 ("annual effects"). This figure does not include new programs that began in 2011 or new 2011 participants in existing programs.

** Seventy (70) percent of all survey respondents in the US reported a value for annualized savings. Of those that report a value of annualized savings, eight-seven (87) percent of respondents reported gross annualized effects. For respondents that did not report gross annualized effects, CEE used net annualized effects in calculating totals.

*** Seventy (70) percent of all survey respondents in Canada reported a value for annualized savings. Of those that report a value of annualized savings, seventy (70) percent of respondents reported gross annualized effects. For respondents that did not report gross annualized effects, CEE used net annualized effects in calculating totals.

Electric efficiency program administrators together estimated annual savings of approximately 133,000 GWh of electricity of 2011 (FIGURE 28).

![Figure 28 Estimated Gross Annual Electric Energy Savings (GWh)*](image)

<table>
<thead>
<tr>
<th></th>
<th>Residential</th>
<th>Low Income</th>
<th>C &amp; I</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>United States</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northeast</td>
<td>6,394</td>
<td>431</td>
<td>10,353</td>
<td>1,017</td>
<td>18,644</td>
</tr>
<tr>
<td>Midwest</td>
<td>6,401</td>
<td>134</td>
<td>13,453</td>
<td>3,029</td>
<td>24,465</td>
</tr>
<tr>
<td>South</td>
<td>6,288</td>
<td>278</td>
<td>5,365</td>
<td>2,184</td>
<td>14,224</td>
</tr>
<tr>
<td>West</td>
<td>18,160</td>
<td>667</td>
<td>35,104</td>
<td>5,971</td>
<td>60,071</td>
</tr>
<tr>
<td><strong>Subtotal, United States</strong></td>
<td>37,243</td>
<td>1,510</td>
<td>64,275</td>
<td>12,200</td>
<td>117,404</td>
</tr>
<tr>
<td><strong>Canada</strong></td>
<td>3,397</td>
<td>115</td>
<td>6,179</td>
<td>2,051</td>
<td>15,810</td>
</tr>
<tr>
<td><strong>Binational Total</strong></td>
<td>40,639</td>
<td>1,625</td>
<td>70,453</td>
<td>14,252</td>
<td>133,214</td>
</tr>
</tbody>
</table>

Notes: The numbers in the sector categories don’t always add up to the total because some respondents only provided a total and didn’t break out their information by sector.

* Based on estimated 2011 savings from measures installed in 2011, as well as from measures installed as early as 1992 that were still generating savings as of 2011 ("annual effects"). This table adds together Figures 26 and 27 above to give an estimation of gross annual effects. When a gross number was not provided a net number was used in calculating totals.

Across the United States and Canada, commercial and industrial electric programs accounted for almost one half of the total energy savings (49 percent), followed by residential (39 percent) and low income programs (two percent). “Other” accounted for 10 percent of the total energy savings and includes programs not otherwise allocable by customer class (FIGURE 29). 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 29 and other charts that distinguish spending or savings by customer class are based only on those dollars that were broken out into the categories below.

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24 Figure 28 is the sum of Figures 26 and 27. The results in this figure are not comparable to the savings that have been published in previous reports because these results were derived from a different methodology than the results in previous reports. For more information on this change, please see the beginning of the section.
Based on the gross incremental savings figure for electric efficiency programs (Figure 26), in 2011, the value of electric energy efficiency savings across the United States and Canada was approximately $4 billion.  

This year, CEE derived rough net-to-gross factors by dividing the net savings reported by the gross savings. In general, net-to-gross factors provide a ratio of net savings to gross savings, which allows conversion of savings values from one to the other. Of those respondents that provided both net and gross savings information in the United States, the average factor was 0.87. The average net-to-gross factor in Canada was 0.78. The range of net-to-gross factors varied widely in the United States, 0.13 to 1.08, while the range of net-to-gross factors in Canada was much narrower, 0.80–0.90 (Figure 30).

<table>
<thead>
<tr>
<th>United States</th>
<th>Average NTG Factor</th>
<th>Range of NTG Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northeast</td>
<td>0.96</td>
<td>0.85 - 1.11</td>
</tr>
<tr>
<td>Midwest</td>
<td>0.87</td>
<td>0.46 - 1.00</td>
</tr>
<tr>
<td>South</td>
<td>0.83</td>
<td>0.67 - 1.00</td>
</tr>
<tr>
<td>West</td>
<td>0.84</td>
<td>0.13 - 1.08</td>
</tr>
<tr>
<td>United States Range</td>
<td>0.87</td>
<td>0.13 - 1.37</td>
</tr>
<tr>
<td>Canada Range</td>
<td>0.78</td>
<td>0.80 - 0.90</td>
</tr>
<tr>
<td>Binational Range</td>
<td>0.86</td>
<td>0.13 - 1.37</td>
</tr>
</tbody>
</table>

US electric retail values were calculated based on the average retail price of electricity to ultimate customer by state and by end use sector across the United States in 2011 using data from the Energy Information Administration’s Electric Power Monthly February 2012 issue which has YTD December 2011 data. [http://www.eia.gov/electricity/monthly/current_year/february2012.pdf](http://www.eia.gov/electricity/monthly/current_year/february2012.pdf)


Average electric rate used: $0.1215 CAD per kWh (residential) and $0.0732 (commercial and industrial). The electric rate for “other” savings was determined by taking the average of the residential and the commercial and industrial electric 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.
5.1.2 Natural Gas Program Savings

Reporting natural gas efficiency programs in the United States and Canada estimated incremental savings of nearly 363 million therms of gas in 2011 (Figure 31). This is equivalent to 1.8 million metric tons of avoided CO$_2$ emissions. CEE member programs accounted for 81 percent of the total energy savings estimate.

![Figure 31 Estimated Gross Incremental Gas Energy Savings (MDth)*](United States)

<table>
<thead>
<tr>
<th></th>
<th>Residential</th>
<th>Low Income</th>
<th>C &amp; I</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Northeast</strong></td>
<td>2,924</td>
<td>762</td>
<td>2,394</td>
<td>1,182</td>
<td>7,263</td>
</tr>
<tr>
<td><strong>Midwest</strong></td>
<td>4,384</td>
<td>341</td>
<td>5,925</td>
<td>583</td>
<td>11,233</td>
</tr>
<tr>
<td><strong>South</strong></td>
<td>329</td>
<td>22</td>
<td>111</td>
<td>2</td>
<td>464</td>
</tr>
<tr>
<td><strong>West</strong></td>
<td>1,614</td>
<td>763</td>
<td>6,248</td>
<td>1,006</td>
<td>9,631</td>
</tr>
<tr>
<td><strong>Subtotal, United States</strong></td>
<td>9,252</td>
<td>1,888</td>
<td>14,678</td>
<td>2,774</td>
<td>28,591</td>
</tr>
<tr>
<td><strong>Canada</strong></td>
<td>590</td>
<td>156</td>
<td>6,886</td>
<td>67</td>
<td>7,700</td>
</tr>
<tr>
<td><strong>Binational Total</strong></td>
<td>9,842</td>
<td>2,044</td>
<td>21,564</td>
<td>2,841</td>
<td>36,291</td>
</tr>
</tbody>
</table>

Notes:

* Based on estimated 2011 savings from all energy savings that accumulated from new participants in existing programs and all participants in new programs in 2011 (“gross incremental effects”).

** Ninety-six (96) percent of respondents reported a value for incremental savings. Of those that reported a value for incremental savings, eighty (80) percent of respondents reported gross incremental effects. For respondents that did not report gross incremental effects, CEE used net incremental effects in calculating totals. Due to the way that CEE exchanges data with AGA, this percentage cannot be broken out by country.

Natural gas efficiency program administrators that reported an annualized savings figure estimated savings of approximately 1.7 billion therms of gas in 2011. As shown in Figure 32, 59 percent of respondents in the United States and Canada reported a figure for annualized savings.

![Figure 32 Estimated Gross Annualized Gas Energy Savings (MDth)*](United States)

<table>
<thead>
<tr>
<th></th>
<th>Residential</th>
<th>Low Income</th>
<th>C &amp; I</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Northeast</strong></td>
<td>4,618</td>
<td>1,541</td>
<td>8,082</td>
<td>550</td>
<td>14,790</td>
</tr>
<tr>
<td><strong>Midwest</strong></td>
<td>12,508</td>
<td>1,742</td>
<td>24,424</td>
<td>3,077</td>
<td>41,751</td>
</tr>
<tr>
<td><strong>South</strong></td>
<td>297</td>
<td>42</td>
<td>46</td>
<td>0</td>
<td>384</td>
</tr>
<tr>
<td><strong>West</strong></td>
<td>9,690</td>
<td>1,144</td>
<td>24,124</td>
<td>4,094</td>
<td>39,053</td>
</tr>
<tr>
<td><strong>Subtotal, United States</strong></td>
<td>27,113</td>
<td>4,469</td>
<td>56,676</td>
<td>7,720</td>
<td>95,979</td>
</tr>
<tr>
<td><strong>Canada</strong></td>
<td>12,391</td>
<td>92</td>
<td>23,333</td>
<td>35,096</td>
<td>70,912</td>
</tr>
<tr>
<td><strong>Binational Total</strong></td>
<td>39,504</td>
<td>4,562</td>
<td>80,009</td>
<td>42,816</td>
<td>166,891</td>
</tr>
</tbody>
</table>

Notes:

* Based on estimated 2011 savings from measures installed as early as 1992 that were still generating savings as of 2011 (“annualized effects”). This figure does not include new programs that began in 2011 or new 2011 participants in existing programs.

** Fifty-nine (59) percent of respondents reported a value for annualized savings. Of those that reported a value for incremental savings, eighty (80) percent of respondents reported gross annualized effects. For respondents that did not report gross annualized effects, CEE used net annualized effects in calculating totals. Due to the way that CEE exchanges data with AGA, this percentage cannot be broken out by country.
Natural gas efficiency program administrators that reported an annual savings figure estimated savings of approximately 2.0 billion therms of gas in 2011 (Figure 33).26,27

<table>
<thead>
<tr>
<th>United States</th>
<th>Residential</th>
<th>Low Income</th>
<th>C &amp; I</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northeast</td>
<td>7,542</td>
<td>2,303</td>
<td>10,476</td>
<td>1,732</td>
<td>22,053</td>
</tr>
<tr>
<td>Midwest</td>
<td>16,892</td>
<td>2,083</td>
<td>30,349</td>
<td>3,660</td>
<td>52,984</td>
</tr>
<tr>
<td>South</td>
<td>626</td>
<td>64</td>
<td>157</td>
<td>2</td>
<td>849</td>
</tr>
<tr>
<td>West</td>
<td>11,305</td>
<td>1,907</td>
<td>30,373</td>
<td>5,100</td>
<td>48,684</td>
</tr>
<tr>
<td>Subtotal, United States</td>
<td>36,365</td>
<td>6,357</td>
<td>71,354</td>
<td>10,494</td>
<td>124,570</td>
</tr>
<tr>
<td>Canada</td>
<td>12,981</td>
<td>249</td>
<td>30,219</td>
<td>35,163</td>
<td>78,612</td>
</tr>
<tr>
<td>Binational Total</td>
<td>49,346</td>
<td>6,605</td>
<td>101,573</td>
<td>45,657</td>
<td>203,182</td>
</tr>
</tbody>
</table>

Notes:
* Based on estimated 2011 savings from measures installed in 2011, as well as from measures installed as early as 1992 that were still generating savings as of 2011 (“annual effects”). This table adds together Figures 31 & 32 above to give an estimation of gross annual effects. When a gross number was not provided a net number was used in calculating totals.

Across the United States and Canada, commercial and industrial programs accounted for the majority of energy savings (59 percent), followed by residential programs (27 percent), and low income programs (six percent). “Other” accounted for eight percent of the estimated natural gas energy savings and includes programs not otherwise allocable by customer class (Figure 34).

Figure 33 is the sum of Figures 31 and 32. The results in this figure are not comparable to the savings that have been published in previous reports because these results were derived from a different methodology than the results in previous reports. For more information on this change, please see the beginning of the section.

This number is slightly smaller than the number published by AGA in their report. This is because CEE made a small revision to our data after AGA had published their report.
CEE was unable to perform a net-to-gross analysis of natural gas programs this year. Based on the gross incremental savings figure for natural gas efficiency programs (Figure 31), in 2011, the value of natural gas energy efficiency savings across the United States and Canada was approximately $300 million.\(^\text{28}\)

\(^{28}\) Natural gas retail values for the United States and Canada were calculated based on the average retail price per therm across the United States in 2011 using data from Energy Information Administration: Natural Gas Annual Report, Table 24: Average Price of Natural Gas Delivered to Consumers by State. Accessed January 2013. [http://www.eia.gov/dnav/ng/ng_pri_sum_dcu_nus_a.htm](http://www.eia.gov/dnav/ng/ng_pri_sum_dcu_nus_a.htm)

Average natural gas prices used: $1.08 per therm (residential) and $0.69 per therm (commercial and industrial). The value of “Other” savings was calculated by taking the average of the residential, commercial, and industrial values.