Big Opportunities for Small Business: Successful Practices of Utility Small Commercial Energy Efficiency Programs

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Executive Summary

The great majority of gas and electric utility commercial customers are small businesses. Utility energy efficiency programs are beginning to tap the potential for energy and demand savings in the small business sector. In this report, we provide examples of successful practices and describe emerging approaches.

PREVALENT PROGRAM MODELS AND PERFORMANCE

A typical small business program provides rebates for lighting measures to retail, grocery, small offices, convenience stores, and other nonresidential customers with electric demand below 100 kW. In one delivery model, called direct install, the program implementer performs an energy assessment and sets up installation of measures—most frequently LED lamps, and often free of charge—in the same visit. Even if implementers offer more extensive measures, direct installation programs do not require customers to find their own installation contractors. Alternatively, non–direct install programs, including assessment-and-incentive models, provide varying degrees of integrated and comprehensive services for the customer.

In terms of performance, we reviewed data from 15 gas and electric programs and found wide variation in spending and savings levels. Small business program size as measured by annual spending varies widely. So does savings performance relative to spending, as well as the share of total spending in each energy efficiency portfolio dedicated to small business programs. Of those, the smallest programs are spending $1 million to $3 million per year on small business electric efficiency, the larger ones in the $10 million to $20 million range, with the median at $7 million. In terms of the percentage of its entire electricity portfolio spending that each utility devotes to small business programs, two-thirds of the 15 utilities spend in the 7–14% range. The average of all 15 is 12%. We found that this set of programs achieved an average of 9% of total utility portfolio gross kWh savings.

Small business program gas spending and savings also varied widely. Spending ranged from a low of 0.2% of total portfolio spending up to a high of 5.9%. Gross therm savings for these programs ranged from less than 0.1% of the total portfolio up to more than 22%.

DESIGN CHALLENGES

Small businesses have been underserved by energy efficiency programs due to barriers to participation that small business owners face. These customers do not have the time to devote to energy efficiency, they are too small to employ staff for it, and they lack capital to make investments. Since many rent their facilities, they do not have decision-making control over building energy systems. They also lack awareness and knowledge of energy efficiency benefits and how to make use of the utility programs.

Addressing these customer barriers is not always enough to convince owners to participate in programs. On the utility side, structural and economic limitations hinder program managers from designing and implementing programs that garner broad participation and capture deep savings from small business customers. The sector is diverse in terms of industry, energy uses, savings opportunities, financial needs, languages spoken, building types, and culture, all with implications for program design. It may not be cost effective to serve microbusinesses (those with average monthly demand below 25 kW) with traditional

approaches; marketing and implementation costs can exceed the potential energy savings value.

For all sizes of small business, programs face an economic trade-off between acquiring the maximum cost-effective savings per customer and serving more customers. Because of the high cost of acquisition relative to the small pool of potential savings, it is generally preferable to capture all savings potential in one initial transaction; serial visits and multiple installations are often cost prohibitive.

RECOMMENDED SUCCESSFUL PRACTICES FOR SMALL BUSINESS ENERGY EFFICIENCY

We interviewed experts and reviewed program reports and research literature in order to identify successful program design elements and effective practices for addressing barriers to participation. We recommend the following practices for utility small business programs.

Provide streamlined installation and lighting measures. Lighting delivers cost-effective savings through a small set of efficiency measures to a variety of businesses in most industries and customer subsegments. Use direct install or another program delivery method that makes participation simple, easy, and convenient. Employing preferred or contracted vendors also reduces costs through volume replication of similar installations.

Segment the market. Classify the small business customer base into subsegments with common characteristics and energy needs, and then offer customized approaches tailored to each in order to improve participation, customer satisfaction, and depth of savings. Design program structure and services (measures, incentive levels, and delivery pathways) appropriate to each customer type.

Tailor and target marketing and communications to customer needs. In concert with segmentation, craft marketing messages for each industry subsector and present them in a customized, personalized way. Generic messages may not be perceived as relevant. Use customer and market data analytics to segment and target potential high-savings customers in order to increase participation and reduce marketing cost per business.

Offer financing to encourage comprehensive retrofits and deeper savings. Address the up-front cost barrier and provide needed project funds by offering loans to program participants. We found a high correlation between the largest, best-performing small business programs and those that offer financing, especially on-bill financing and on-bill repayment. The highest correlation was with programs that offer 0% financing. Participation drops off dramatically when any interest rate at all is charged. Zero-interest loans avoid numerous lending and credit law entanglements as, technically, these are not loans at all, but rather scheduled payments of the customer's copay over time. Pairing convenient low- or no-interest financing with high measure rebates can reduce customers' share of project costs and provide them with an instant positive cash flow. This can be important for businesses with low profit margins and high energy use.

Offer a wide set of eligible measures. For many industry segments, lighting is not the greatest user of energy, and for some it is less than one-quarter of the total. Deep savings are not possible unless programs offer non-lighting measures. Many programs offer programmable

thermostats, refrigeration, and natural gas saving measures that are a natural fit for the direct install model. Effective advance market segmentation research will reveal appropriate measure packages by customer type.

Provide dedicated project process managers. Expand program participation by providing direct technical assistance and support on energy efficiency, perhaps in collaboration with local organizations. Conducting energy assessments and walking customers through the program and measure installation process can help reach underserved market segments.

Establish partnerships. Chambers of commerce, small business advocacy organizations, and community groups can provide access to more commercial customers and engage them as trusted local partners in ways that utilities on their own generally cannot. This paves the way for increased program awareness and participation.

EMERGING PROGRAM MODELS AND FEATURES

Our research also identified trends that may not have the broad applicability of the practices above but are still noteworthy. Examples include pay-for-performance program models and online customer engagement tools.

The pay-for-performance program model is becoming more common in energy efficiency portfolios. In this approach, the utility works with an implementation contractor or service provider who offers vertically integrated energy efficiency services to small businesses based on a negotiated contractual price for energy savings. This model aims to reduce risk for the utility and make service quality more consistent. While cost effectiveness and customer satisfaction are high, savings are typically all from lighting measures, leaving the program with lost energy efficiency opportunities.

Several utilities are providing energy assessments and energy efficiency recommendations on their websites specifically for small businesses. These tools are more engaging and satisfying to customers than static web pages with lists of measures and rebates. We did not find data demonstrating that they were driving increased program participation, but it is still too early to assess this trend. Some utilities are going further, developing more extensive online customer engagement tools and integrating them with their customer billing and marketing data. They are also actively promoting the services to increase customer use of the online software.

REMAINING CHALLENGES

Multiple challenges remain. We describe two of the major structural and organizational issues. First, the predominant direct install and lighting-oriented program models have not proved effective in acquiring substantial natural gas savings for dual-fuel utilities. With few exceptions, large gas measures such as furnaces, boilers, and insulation are costly and do not lend themselves to a direct install or other streamlined delivery format. In general, combined gas and electric programs have inherent challenges (e.g., administrative complexity) that add to other program design issues specific to the small business segment.

Second, since most small businesses are tenants, the split-incentive barrier, or landlord-tenant problem, has a widespread impact on what current programs can achieve in the

absence of new designs. Since building owners are the ones who make energy efficiency decisions, small businesses often do not have control. Efforts to use energy-efficient or green leases in smaller buildings are not yet integrated with utility small business programs.

CONCLUSIONS

No one small business energy efficiency program design is a best fit for all utilities. We recommend that managers consider and adapt the proven approaches in this report and monitor new practices as they evolve and show results.

Introduction

Small businesses are the backbone of our national economy. These enterprises—more than 25 million of them—are critical to the health of local economies, generating more than half of net new private-sector jobs. They are a large market for electric and natural gas utilities. Small businesses fill over 30% of all commercial space, more than 20 billion square feet requiring energy for heating, cooling, lighting, and other purposes (SBA 2016).

This important part of the commercial sector has been underserved by utility energy efficiency programs. According to EnergySavvy (2016), the so-called "forgotten middle"—small-to-medium commercial and industrial utility customers—represent 97% of US businesses and consume about 20% of the nation's energy, but attract less than 4% of utility energy efficiency spending. This market continues to hold significant opportunities.

ACEEE research (Nowak et al. 2013; Nowak, Kushler, and Witte 2014; York et al. 2013; York et al. 2015) has documented examples of successful small business energy efficiency approaches, but how can these be expanded and replicated? What are the new and emerging technologies, program designs, and marketing strategies to take small business energy efficiency to the next level? In this report, we explore answers to these questions.

Objectives and Methodology

RESEARCH OBJECTIVES

Our first objective is to describe current utility small business program approaches and to identify those that hold potential for future growth. Our second objective is to present program features, approaches, designs, and marketing that can enable greater performance.

SCOPE

We collected data on customer-funded gas and electric programs primarily serving small business customers with average monthly electric demand of 200 kW or less, although a few serve somewhat larger customers (up to 400 kW) and we did not exclude them. Restaurants, convenience stores, small grocery stores or other retailers, and professional services offices are typical examples of such customers. Many programs also include schools, nonprofit organizations, and houses of worship or public assembly buildings. Eligibility standards for participation vary by program and by initiatives within programs.

Our focus is on programs specifically designed for small nonresidential customers, not the commercial and industrial (C&I) sector overall. We did not collect data on general C&I programs, although many of them consider small businesses to be eligible. Similarly, commercial new construction programs are outside of our research scope.

SELECTION OF PROGRAMS AND SAMPLING

While we did not design our selections as a statistically representative sample, we initially chose programs to approximately reflect their geographic distribution, to include programs of varying sizes, and to include some combined gas and electric programs. All programs are in investor-owned utility energy efficiency portfolios. We did not collect quantitative program performance data on small business programs within third-party administrator, municipal, or cooperative utility portfolios, although many such programs exist. We focused

on investor-owned utilities because data were available from annual program report filings to state commissions.

DATA COLLECTION

To compile quantitative metrics on programs and performance, we reviewed 31 utility energy efficiency annual reports for 24 utilities. From that group, we selected 15 programs for more extensive data collection based on location and data availability. These reflected diversity in terms of program and utility size, length of time the program has been running, and inclusion of examples of natural gas energy efficiency approaches. We collected additional quantitative and qualitative information from regulatory filings, impact and process evaluation reports, and phone interviews with utility program managers and implementation contractors. Brief descriptions of these and other small business programs are presented in Appendix A.

EXPERT INTERVIEWS

We interviewed 15 experts with extensive knowledge in various aspects of small business energy efficiency program design, performance, and trends. Of these, four represented regional or national consulting firms, nonprofit business groups, or government agencies; six managed utility small business energy efficiency programs or commercial portfolios, and five were from program implementation contractors.

Current Landscape

PREVALENT PROGRAM MODELS

Small business programs fall into three prevalent categories: prescriptive, custom, and audit-only (Hoffman et al. 2013). Prescriptive programs offer a set of rebates for a defined group of energy efficiency measures. From our review of program reports, the prescriptive rebate approach is the most widely used way to serve small businesses. Custom programs are more often seen serving medium and large commercial and industrial accounts, although some do serve small businesses. Custom programs involve modeling the end uses, equipment, and possible energy-efficient technologies for the specific building or enterprise in question. Audit-only programs generally offer free or low-cost energy assessments to the business and recommend energy efficiency measures, sometimes referring the owner to prescriptive programs that offer rebates.

We focused on prescriptive programs in our research because of their prevalence among programs for small business. Within the prescriptive category, program models can be placed along a continuum according to how complex it is for the customer to participate. For simplicity, we group models into two broad categories, direct install and what we are calling assessment-and-incentive programs.

Direct Install

The most widespread program model for the small business segment is direct install. In a direct install program, implementers or vendors directly provide energy efficiency measures on site, with the approval of the business customer. Direct install (DI) approaches vary, although there are common elements that define the category. Ideally the customer does not

need to fill out extensive paperwork, seek out bids from multiple contractors, schedule multiple follow-up appointments, or wait a long time for rebates to be paid.

The Small Business Lighting Program offered by Public Service of Colorado is an illustrative example. This model has direct install features and also attempts to cross-sell customers additional energy efficiency offerings. To be eligible for the DI services, a business must have average monthly electric demand below 100 kW. The implementation contractor hired by the utility conducts an on-site energy assessment and installs the DI measures—LED lamps and faucet aerators in this case—on the spot, at no charge to the customer. Immediate installation at low or no cost was originally the defining feature of direct install that gave it its name. Today "direct install" is also used more broadly to include small business programs that schedule installations at a later date.

The direct install programs that we reviewed offer simple and relatively low-cost measures that are compatible with this turnkey approach, especially LED (light emitting diode) and CFL (compact fluorescent lamp) lighting. Some provide water- and gas-saving measures including low-flow aerators, high-pressure rinse sprayers, water heater thermostat setback, and water pipe insulation.

We present performance data on several direct install programs that exemplify the model—providing energy evaluation or assessment, presenting possible incentivized measures to the customer, and offering turnkey installation—in tables 1 and 2. Examples include the Mass Save® small business programs in Massachusetts, Oncor's Small Business Direct Install MTP (Market Transformation Program) in Texas, and Tucson Electric Power Company Small Business Direct Install Program.

Several DI programs provide incentive funds upstream to contractors. The trade allies then pass the rebates on to the utility customers.

Assessment-Plus-Incentive Programs

In contrast to DI, assessment-and-incentive programs involve more steps for the customer. These programs require the business owner to find his or her own contractor or arrange installation with a contractor recommended through the program. Xcel Energy's Colorado Small Business Lighting program has both DI and non-DI components. Businesses with average monthly demand of up to 400 kW are eligible. After the implementation contractor does the assessment and installs any DI measures, the contractor prepares an assessment report that makes prescriptive and custom measure recommendations—including non-lighting opportunities for both electric and natural gas—and describes the available financial incentives and rebates. The implementer also puts the business owner in touch with a contractor to perform the installation and walk the owner through the rebate application form.

The One-Stop Efficiency Shop, run by the Minnesota Center for Energy and Environment (MNCEE) for Xcel Energy in Minnesota, is a leading example of the assessment-and-incentive model. As with DI programs, the energy assessment and presentation of options and incentives are included. The key difference is that MNCEE can assign a contractor or the customer can choose his or her own. Other examples, such as the Efficiency Vermont

Small Business program and BC Hydro's Business Energy Saving Incentives program, require participants to find their own contractors (Dunsky 2016).

PROGRAM SIZE AND PERFORMANCE

Regulatory, policy, and business environments shape small business energy efficiency programs. While the small business market may offer large energy and demand savings potential with considerable room for growth, a utility's small business program objectives may be more narrowly drawn. Some managers allocate a specific budget to small business programs and seek to maximize savings within this budget constraint. Other managers may seek program designs that will help them meet regulatory targets established and expressed in annual or multiyear program plans approved by the state utility commission. Depending on the state and the utility's business strategy, the goal may be to meet energy savings requirements, rather than to maximize cost-effective savings or expand participation. In addition, the utility may have its own internal drivers for offering or expanding small business programs, such as customer engagement and satisfaction. State regulators often require or encourage program designs that allow each customer class of program services (in this case small business) to recoup its share of the system benefit charge on the bill.

Tables 1 and 2 below provide data on the relative magnitude of program spending and gross energy savings for a range of utility small business programs. Every metric varies across utilities, even among this small set of programs. Annual electric program spending ranged from Entergy New Orleans's $303,944 up to Pepco's nearly $66 million in 2014—more than 200 times as much for only about three times as many commercial customers. The smaller programs are spending $1 to $3 million per year on electric efficiency, the larger ones in the $10 to $20 million range, and the median is $7 million. The share of electric spending that each utility in our set devotes to small business programs relative to its entire portfolio does not vary as much. Two-thirds of the 15 utilities spend in the 7–14% range. The average of all 15 is 12%. The small business programs listed in table 1 are, on average, responsible for 9% of their respective utilities' overall 2014 portfolio electric savings.

Brief descriptions of these and other small business programs are presented in Appendix A.

Table 1. Small business electric energy efficiency program spending and savings 2014

State	Utility and program	Small business electric spending	% of total electric portfolio spending	Gross incremental electric savings (kWh)	% of total electric portfolio kWh savings
AR	Entergy Arkansas Small Business Program[1]	$3,171,022	5%	12,012,111	5%
AZ	Tucson Electric Power Company Small Business Direct Install Program[2]	$1,485,189	11%	5,613,047	3%
CA	Southern CA Edison Commercial Direct Install[3]	$39,566,270	13%	NA	NA
CO	Xcel Energy CO Small Business Lighting[4]	$3,015,630	4%	11,768,093*	3%
CT	Eversource CT Small Business Energy Advantage[5]	$16,021,475	11%	32,546,000	11%
CT	United Illuminating Small Business Energy Advantage[6]	$2,552,819	7%	7,114,000	10%
LA	Entergy New Orleans Small Commercial Solutions 2014–15 (PY4)[7]	$303,944	13%	2,519,153	15%
MA	National Grid C&I Direct Install[8]	$21,824,807	10%	39,716,000	6%
MA	Eversource C&I Direct Install[9]	$25,842,028	14%	47,183,000	8%
MD	Baltimore Gas and Electric Small Business Program 2015[10]	$11,478,644	10%	36,112,080	9%
MD	Baltimore Gas and Electric Small Business Program[11]	$10,279,376	9%	31,702,480	8%
MD	Pepco Small Business Program 2015[12]	$37,990,815	39%	61,877,500	19%
MD	Pepco Small Business Program[13]***	$65,839,570	56%	122,017,660	28%
MI	Consumers Energy Small Business Solutions Program[14]	$7,084,657	9%	46,257,868	12%
SC	Duke Energy Progress Small Business Energy Saver[15]**	$1,451,918	14%	31,139,068	10%
TX	Oncor Small Business Direct Install MTP[16]	$1,461,491	3%	4,919,113	2%
WA	Puget Sound Energy Small Business Direct Install & Lighting Rebate[17]	$3,905,110	4%	12,704,000	3%

Spending and savings are from 2014 calendar year, except as noted. *Savings are at generator. **Savings are net. ***Includes ordered budget increase of $31 million (Pepco). *Sources:* Program annual report filings as follows: [1] Entergy Arkansas 2015. [2] TEP 2015. [3] CPUC 2016. [4] Xcel 2015. [5] CEEF 2016. [6] CEEF 2016. [7] Entergy New Orleans 2015. [8] National Grid 2015b. [9] NSTAR Electric 2015. [10] BGE 2015a. [11] BGE 2016b. [12] Pepco 2016b. [13] Pepco 2015. [14] EMI Consulting 2015. [15] Duke Energy Progress, Inc. 2014. [16] Oncor 2014. [17] PSE 2015.

Small business program gas spending and savings varied widely, as shown in table 2. Spending ranged from a low of 0.2% of total portfolio spending up to a high of 5.9%. Gross therm savings for these programs ranged from less than 0.1% of total portfolio savings up to over 22%.

Table 2. Small business natural gas energy efficiency program spending and savings 2014

State	Utility and program	Small business gas participants	Small business gas spending	Small business gas spending (% of total portfolio)	Small business gas gross incremental savings (therms)	Small business gas savings (% of total portfolio)
CT	Eversource CT Small Business Energy Advantage[1]	58	$218,468	1.2%	53,799	2.0%
MA	Eversource C&I Direct Install 2013[2]	515	$159,933	0.5%	130,101	0.5%
MA	National Grid C&I Direct Install[3]	240	$235,763	0.2%	47,849	0.3%
MI	Consumers Energy Small Business Solutions Program[4]	NA	$2,403,736	5.9%	4,806,615	22.1%
WA	Puget Sound Energy Small Business Direct Install & Small Business Lighting Rebate[5]	NA	$27,172	0.2%	1,296	0.03%

Spending and savings are from 2014 calendar year, except as noted. *Sources:* Program annual report filings and evaluation reports as follows: [1] CEEF 2016. [2] NSTAR Gas 2014. [3] National Grid 2015a. [4] EMI Consulting 2015. [5] PSE 2015.

Program Challenges

To be successful, energy efficiency programs must address and overcome various barriers that can prevent small business customers from participating in incentive programs and making energy efficiency improvements in their facilities (York et al. 2015). There is also a "hard to reach" aspect inherent in the segment that has implications for program design and cost effectiveness.

BARRIERS TO PARTICIPATION

Small business customers face a number of barriers to participation in energy efficiency programs.

Organization size. These enterprises do not have the staff, such as facility managers, to oversee their energy use and make all the efficiency upgrades they might want to undertake.

Time and money constraints. Business owners require short payback times achieved with minimal time commitment on their part. They are busy running their operations and have other, higher priorities. They lack the time, capital, and cash flow to invest in many energy

efficiency measures. Many energy efficiency measures require capital improvements in building equipment and systems, which may have long payback periods. Small businesses typically operate on thin margins and cannot make such long-term investments.

Lack of awareness. Many small business owners are not aware of the benefits of energy efficiency or lack sufficient knowledge of how to take advantage of programs. Unless programs can target and personalize their outreach and marketing to gain the attention of small commercial customers, it can be a challenge to enhance customer understanding of program benefits and processes.

Split incentives. A very high percentage of small businesses lease space, and many leases are short term. Consequently, while tenants are responsible for paying utility costs, they are not generally in control of the building energy systems (HVAC, building envelope, etc.) and see no reason to invest in the landlord's building.

Relatively small energy bills, and thus relatively small dollar saving potential. As noted above, energy is just one of myriad responsibilities facing the small business owner. Many believe that the modest dollar savings they could expect is simply not worth the effort.

Perceived disruption potential. Business owners sometimes fear that the retrofit process will disrupt ongoing business or that changes will not be well received by employees or customers.

A DIVERSE, DIFFUSE, AND DISPERSED SEGMENT

Dealing with barriers to participation on the customer side is only part of the equation. Small business is often described as hard to reach by energy efficiency programs.[1] Compared with other segments, it is more diverse, diffuse, and dispersed. These characteristics pose a unique set of challenges for program management and design. Small business customers are diverse in energy uses, industries, savings opportunities, financial needs, languages spoken, building types, culture, and other aspects. With more business premises and less energy to be saved at each one, small commercial customers are geographically dispersed. Rural utility customers are physically farther from contractors, utility support, and referrals from other small business program participants than their urban counterparts.

There are multiple industry subsectors and types of businesses. The characteristics of the subsectors within the small commercial area can both inform program design and delivery models and represent challenges to them. Businesses differ by what motivates them to participate in utility programs and by what stops them. Some are energy intensive, such as family or franchise restaurants and local grocery stores, and typically hold large energy-saving opportunities. However these businesses may lack the expertise, time, or capital resources to engage with utility programs. On the other end of the spectrum, houses of worship might be more interested in saving money through energy efficiency, but due to

[1] We call the category "small business," but in practice it is more accurately described as small nonresidential, because it usually includes schools, nonprofit organizations, houses of worship, and other types of utility customers.

the low operating hours of their buildings, they have less potential for cost-effective energy efficiency savings. Hotels and motels are high gas and electric consumers, often using relatively inefficient in-room units for heat and air-conditioning, rather than central systems. At the same time, hotels and motels may lack onsite energy expertise, particularly if they are independently owned or a small franchisee. Often managers on location are not the relevant decision makers.

Lower energy use and corresponding lower potential savings from energy efficiency per customer or premise make small business energy efficiency opportunities more diffuse than they are among larger business customers. A disproportionate number of program participants achieve very low energy savings per project. Less than 10% of participating small businesses in the Duke Energy Small Business Energy Saver program saved more than 75 MWh per year, and the average savings per participant was 22 MWh (Navigant 2015, 7). For context, consider that medium and large commercial customers can use 10 times to 100 times the energy and demand with proportional savings potential.

Since the small business sector has more individual business premises, more individual decision makers, and less energy and demand savings potential at each one, this usually means—all else being equal—greater utility program overhead and administration costs per unit of saved energy, compared with larger commercial and industrial (C&I) customer accounts. For microbusinesses with monthly demand below 20 or 30 kW, the marginal costs of marketing, outreach, and in some cases energy assessment may make serving that business prohibitive. For example, if it costs the utility or implementer $150 to send a contractor to the business premises to conduct an energy assessment, then that establishes a threshold minimum amount of energy savings needed for the project to break even. With every business owner who declines to participate, that $150 must be made up elsewhere for the program as a whole to be cost-effective. The simple math requires that that program models must have very high customer acceptance rates to be successful.

ECONOMIC FACTORS SHAPING PROGRAM DESIGNS

Utilities have an interest in minimizing the program cost to acquire energy savings and demand reduction, or, for those in a state requiring the pursuit of all cost-effective efficiency, at least satisfying the minimum required benefit cost test.

From a portfolio resource standpoint, the average program administrator cost of saved energy (CSE) for small commercial electric programs considered as a category is substantially higher than for commercial and industrial overall.[2] This suggests that one reason the small commercial subsector attracts a smaller proportion of portfolio budgets is

[2] Small business programs can be viewed and compared at the portfolio level, as a demand-side utility resource, or by the metric of lifetime costs of saved energy (CSE). CSE calculated with a common discount rate would be an important metric for a benchmarking study ranking small business programs by overall performance. Benefit–cost ratios such as the total resource cost (TRC) or utility cost test (UCT) for different programs across utilities and in multiple states vary by a number of factors. In addition to the tests themselves differing, components of how they are calculated, including the avoided cost of energy and the discount rate employed, differ as well. Those measures of first-year savings do not capture the total savings over the full measure lives and are therefore not useful for long-range planning.

that savings are more expensive for program administrators. Among 93 small commercial programs examined in one recent study, the savings-weighted average levelized CSE was $0.035/kWh, while for business programs overall it was less than $0.02/kWh. For 259 prescriptive C&I programs other than small commercial, the average was $0.015/kWh (Billingsley et al. 2014, 32).

To obtain cost-effective savings, utilities tend to invest more in the simpler, lower-cost, higher-potential options. We observed programs acquiring the majority of savings from a small set of the most cost-effective lighting measures. For example, in the Duke Energy Small Business Energy Saver program, 94% of kWh savings were from lighting and 6% from refrigeration in 2014. Table 3 shows the dominance of lighting measure electric savings in utility small business programs.

Table 3. Percentage electric savings from lighting measures

State	Utility program	Year	Lighting % of total electric savings	Measures
SC	Duke Energy Small Business Energy Saver[1]	2014	94%	88% resulted from T8 linear fluorescent lamps and LEDs
MD	Pepco Small Business Savings[2]	2014	93%	90% LEDs
MI	Consumers Energy Small Business Solutions Core Program[3]	2014	93%	Multiple lighting measures; refrigeration measures; anti-sweat heater controls; ECM motors
MA	All Massachusetts program administrators[4]	2012	89%	6% refrigeration end-use measure savings; 3% motors/drives
IA	MidAmerican Small Commercial Assessment /Commercial Energy Solutions[5]	2014	88%	NA

[1] Navigant 2015. [2] Pepco 2015. [3] EMI Consulting 2015. [4] EEAC 2015. [5] MidAmerican 2015.

Given the diverse characteristics of the industries within the small business sector, utilities typically streamline small business programs to serve the largest subsectors that have common characteristics. Even when the project cost effectiveness is potentially sufficient, the utilities have an incentive to design and administer small business programs to target those customers that will maximize savings for the program overall. This tends to be small business customers with higher energy use. For example, if the program category ceiling is 100 kW demand, it is common to see a higher number of participants closer to that cap. This often conflicts with the utility's interest in providing energy efficiency services to more

customers. It can be challenging to balance those conflicting objectives: equity versus cost-effectiveness.[3]

Figure 1 illustrates the tendency to target the higher energy users. We see a direct correlation between the size category of the business and the rate of participation in Massachusetts energy efficiency programs in 2012 for businesses of all sizes. It shows that less than 5% of business customers with average monthly peak demand below 50 kW participate in energy efficiency programs. For slightly larger customers with average monthly peak demand between 50 and 99 kW, which are also defined as small businesses, the participation rate is 8%. In contrast, a quarter to a half of the medium and large business accounts participate in energy efficiency programs.

The difference of scale has a larger influence on participation rate than the relative depth of savings as a percentage of participating customer pre-program energy use. Using the Massachusetts example, the small business program participants saved 17% of kWh, while participants in the Large Retrofit program cut their electric load by 4%. Of the eligible small businesses, 1.4% participated in the energy efficiency program in 2012, in marked contrast with the Large Retrofit program, which had a 16.9% participation rate that year (DNVGL 2015).

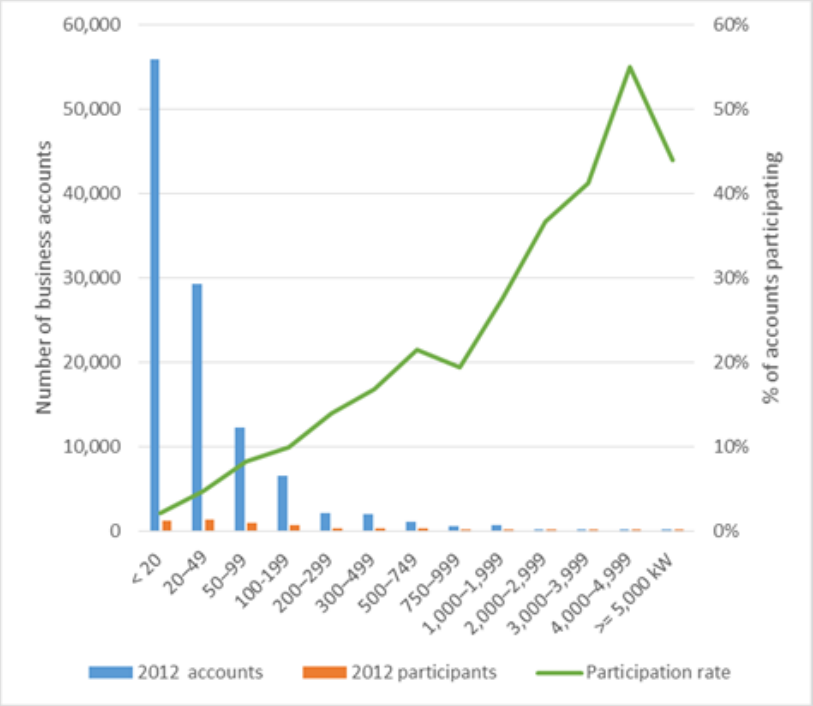

Figure 1. Massachusetts 2012 business customer program participation by peak demand. *Source:* DNVGL 2014.

[3] In fact, 93% of small business customers are below 100 kW and make up 41% of typical utility load within the small business sector (Felton 2015). These data demonstrate the vast potential that remains in the small business segment.

Successful Practices

We identified several successful practices from our reviews of program reports, research literature, and expert interviews. These address barriers to participation and promote high program performance. Many reinforce one another, creating a compound impact.

PROVIDE STREAMLINED INSTALLATION AND LIGHTING MEASURES

The predominant direct install lighting program model has many advantages for addressing the distinctive set of barriers small business programs face. In particular, lighting programs can deliver cost-effective energy savings through a small number of common efficiency measures to a wide variety of businesses in various industries. It was the initial platform for success for many of the largest and longest-standing small business programs, including the Mass Save program in Massachusetts, the Eversource and United Illuminating programs in Connecticut, National Grid's programs in Rhode Island and New York, and ComEd's program in Illinois. An assessment-and-incentive approach focused on lighting is also used to achieve consistent, cost-effective savings and solid participation counts by some utilities, notably Xcel Minnesota through MNCEE's One-Stop Efficiency Shop (MN CEE 2016).

Utilities examining potential small business services for the first time should consider direct install and other convenient, turnkey, lighting-only program designs as a way to introduce and widely popularize their services to the small business sector, thereby establishing a platform upon which to add more measures in the future.

Lighting will continue to be an attractive end-use area for programs to target. With the rapid advancement of LEDs, programs have changed product and technology offerings and have been moving toward more comprehensive lighting designs to continue to capture savings. Commercial lighting programs have engaged lighting designers and stepped up their contractor and trade ally training programs. This evolution has in part been a response to the impact of federal lighting standards on the savings potential for linear fluorescent bulbs by raising the baseline efficiency for various products (York et al. 2015). In 2009, the U.S. Department of Energy set new fluorescent lamp standards that effectively prohibited the manufacturing or importing of most of the T12 fluorescent lamps that were on the market as of July 2012. At that time, replacing T12 lamps with T8 was a major source of savings for commercial lighting programs (York et al. 2015).

Small business lighting continues to get more complex and sophisticated, with a greater variety of lighting products on the market and included in program offerings.

SEGMENT THE MARKET

Some programs are classifying the small business customer base into subsegments with common business characteristics, drivers, and energy-consuming equipment and are creating customized approaches for each. This can not only better meet their unique sector needs but also expand program participation and harvest deeper savings. Segmentation may also be by industry type, area income or economic status (e.g., hardship neighborhoods or communities), service territory, or type of organization. This facilitates designing program structure and services (measures, incentive levels, and delivery pathways) most appropriate for each type. Table 4 shows the Consumers Energy segmentation approach, which employs multiple initiatives within the small business program.

Table 4. Consumers Energy segmentation approach in 2014

Initiative	Segmented by	Measures and services	Program design and marketing features and approaches
Thermostat	Fuel and geography (gas-only and combination gas-electric service areas)	Programmable thermostats and other low-cost measures	Measures installed by implementation contractor teams provided with schedules and routes, who then canvassed the area to find additional qualified customers.
Hospitality	Industry sector (includes hotels, motels, and restaurants)	LEDs	Modeled after Thermostat Initiative. Restaurant sector was intended to spur market transformation.
Nonprofit	Form of organization (nonprofit customers identified using applicable SIC codes)	LEDs, pre-rinse sprayers, faucet aerators, kitchen faucet swivel aerators, programmable thermostats, vending misers, and demonstration of linear fluorescent-to-LED retrofits	Not subject to small business usage caps. Electric measures to help nonprofit customers save money.
Thermostat re-programming	Customers in small business facility with programmable thermostat that is not properly scheduled	Programming thermostats to meet customer operational needs	Implementation contractors engage customers directly in their facilities to maximize program participation.
LED drop	Small businesses in electric and dual-fuel territories	LEDs	Boxes of LEDs were delivered by the implementation contractors directly.

Source: EMI 2015

In 2014, Consumers Energy Small Business Direct Install in Michigan, comprising the core program and initiatives, installed 16,181 lighting measures and 10,728 non-lighting measures. Of the non-lighting measures, 9,456 were programmable thermostats and thermostat reprogramming (EMI 2015).

Two types of customers warrant special attention. First, small businesses in low-income communities may be underrepresented in energy efficiency program participation. Second, very small businesses using less than 20 kW monthly average peak still have potential that remains untapped because they tend to be relatively less cost effective for programs to serve. Our research did not reveal successful examples of any full-scale program approaches specifically designed to gain program participation for these market segments. There have been pilot projects within larger small business programs—often with fewer than 100 participants rather than thousands—that illustrate challenges and opportunities.

One example is the Main Street pilot that Eversource ran in Massachusetts.[4] The pilot was a simplified version of its conventional direct install program, geographically narrowed to targeted neighborhood business districts in the greater Boston area. To reduce implementation costs, the program served districts with high densities of very small businesses with demand below 20 kW, providing a limited-time offer of free energy efficiency measures during one-day "neighborhood blitzes." The program would send a mailer or a utility representative to targeted businesses several days in advance. On the day of the blitz, an energy auditor would come to the business and recommend measures to the owner, then electricians and other installers would arrive later that same day, drawing on inventory from a truck that moved with them, to install measures approved by the business customer. Participation rates approached 100% of all targeted businesses (Nowak et al. 2013).

The Small Business Energy Coaching Partnership is another pilot designed to reach a targeted small business subsector. This initiative, in the Lake Street area of Minneapolis, within Xcel Energy's service territory, was organized to reach minority business owners and underserved small businesses. This pilot was initiated by the Lake Street Council and the Chamber of Commerce Energy Smart Program to build on and complement existing energy efficiency programs, such as Xcel Energy/MNCEE One Stop-Efficiency shop and others. The program provided "energy coaches" in the local community to work directly with the small business owners, helping them get energy efficiency grants and loans and assisting them in accessing utility-funded energy efficiency providers. Of the 84 energy assessments conducted, approximately half were in businesses owned by people of color, and almost 60% of all the businesses reported that they had not previously considered an energy assessment (Drake 2016). This pilot is discussed further in the Energy Managers section of this report.

TAILOR AND TARGET MARKETING AND COMMUNICATIONS TO CUSTOMER NEEDS

A common theme from our research is the importance of customer-centered program design and marketing. Experts interviewed emphasized the value of arranging programs to deliver energy efficiency as the business customer wants it, and tailoring delivery and communication approaches to particular customer needs. Targeting of market outreach, personalization of marketing communications, and a variety of approaches to making the offering turnkey and time efficient are described as keys to success again and again. Marketing that is close to the customer is a proven means to increase program participation.

The success of door-to-door outreach exemplifies this point. In an approach comparable to the neighborhood blitz that Eversource used to reach a high percentage of very small customers in the Main Street pilot, Puget Sound Energy rolled out successful community campaigns in 2014. They engaged small business customers directly in Kent, Cle Elum, Bellingham, Lacey, and seven other communities in Washington through door-to-door and word-of-mouth efforts. This community-based approach has been highly successful, with 677 businesses surveyed and 622 projects completed for a notable 84% conversion rate

[4] At the time, the operating company was called NSTAR.

(Crowell and Vargas 2015). By bringing the program to the customer, they addressed the barrier of lack of customer awareness: 75% of customers surveyed in a recent community blitz said that they did not know Puget Sound Energy had energy efficiency programs for small businesses.

The roles that trade allies play, often as the human face of small business programs, can be crucial for program success. Frequently electricians and other contractors are the ones doing the direct marketing of program services. Combined with the utility's target marketing, this has allowed ComEd to achieve exponential growth in its small business program, with participation doubling annually for four years. ComEd's campaigns target specific customers to participate in limited-time offers, offering them a free energy assessment performed by an energy expert of their choosing from ComEd's closed network of trade allies. This has resulted in a 92% conversion rate (Musz 2015).[5]

Contracts for delivery of program services can also be structured to reward successful marketing. For example, the Mass Save small business program delivered by all the Massachusetts utilities pays only for kWh and therms saved. Thus, delivery contractors are incentivized to pursue only those customers who are likely to, or can be persuaded to, accept a project offer, as unproductive audits offer no means for cost compensation.

Sophisticated customer data analytics are playing an increasing role in target marketing and micro-targeting of small business customers. By classifying small business customers through multiple criteria, it is now possible to identify those with the high value, energy savings potential, and propensity to participate by geographic location. Utilities are hiring research and consulting firms to analyze customer and demographic data to focus program marketing. For example, Opinion Dynamics demonstrated the power of data analytics in a study conducted for PSEG Long Island to identify underserved small businesses with high savings potential. To find these target customers, the firm examined information from commercial data provider Dunn & Bradstreet; looked at prior program participation, business size, and location relative to capacity-constrained circuits; and used geospatial analysis (Avseikova et al. 2016). With this level of precision, marketing resources can be concentrated where they will have the most impact.

OFFER FINANCING TO ENCOURAGE COMPREHENSIVE RETROFITS AND DEEPER SAVINGS

To address the first cost or upfront cost barrier, an increasing number of utilities offer financing options to small business customers for energy efficiency measures that require capital investment. The funding may be in the form of on-bill financing (OBF) or on-bill repayment (OBR), although that is not always the case.[6] The source of funds could be utility ratepayer funds or a third-party lender, such as a bank or a community development

[5] The conversion rate, sometimes called "take rate," is the ratio of businesses that participate in the program to those that get energy assessments.

[6] *On-bill financing* is the term for loans used for energy efficiency investments that are paid back via the customer's utility bill. OBF is convenient for the customer because the loan payments are visible on the bill along with the dollar savings from reduced energy use. Ideally, the savings are enough to be "bill neutral," when the energy efficiency project pays for itself, or does even better.

financial institution (CDFI). OBF generally uses utility ratepayer funds to capitalize efficiency loans, and OBR generally uses private capital.

We identified 17 major investor-owned utility (IOU) small business programs in nine states that provide commercial energy efficiency project financing specifically for small commercial customers. While it does not establish a direct cause-and-effect relationship, it is noteworthy that almost all the small business programs that provide financing are among the largest programs, with the most energy savings and participants. For context, consider that more than 85% of capital financing for energy efficiency projects—overall, in all sectors, not only small businesses—is not through utility or statewide administrator programs, but through energy savings performance contracting (ESPC), property assessed clean energy (PACE) programs, and revolving loan funds run by state government agencies (Deason 2016).[7]

Table 5 lists 17 investor-owned utility programs that offer financing in nine states. Municipal and cooperative utilities, which are generally smaller in terms of both program size and loan volume, are not listed.

[7] Note, however, that the projects financed by these nonutility entities often incorporate utility energy efficiency program incentives and services. This combination of financing with other program elements is something we encourage.

Table 5. Investor-owned utility programs offering financing for small and medium commercial energy efficiency projects

State	Utility or institution	Program or financing program
CA	PG&E, SCE, SDG&E, SoCal Gas	OBF pilots
CO	Xcel Energy	Energy efficiency financing (commercial)
CT	Connecticut Light & Power (Eversource)	Small Business Energy Advantage
CT	United Illuminating	Small Business Energy Advantage
MA	National Grid	MassSave Financing for Business Program
MA	Eversource	MassSave Financing for Business Program
MD	Baltimore Gas and Electric	Small Business Energy Advance
MD	Pepco	Small Business Energy Advance
MI	Consumers Energy	Michigan Saves Business Energy Financing Program
MI	DTE Energy	Michigan Saves Business Energy Financing Program
MN	Center for Energy and Environment, Xcel/GRE	Commercial Energy Efficiency Loan Program
MN	Alliant Energy	Low-interest financing
NY	National Grid	Small business loan program
RI	National Grid	Small business loan program

Source: G. Leventis, Electricity Markets and Policy Group, Lawrence Berkeley National Laboratory, pers. comm., April 22, 2016

In recognition of the significant financial constraints faced by small businesses, utilities often provide enhanced economic incentives in combination with financing. Programs will offer customer rebates as high as 50–80% of installed measure costs, then provide financing for the rest, so the customer pays nothing out of pocket. Small Business Energy Advantage (SBEA), provided by major utilities Eversource and United Illuminating through the Energize Connecticut portfolio, is a prototypical example. The financing is part of an overall program design to remove barriers to participation and make it as simple as possible for the small business customer. Energy Advantage participants pay no up-front costs for installed upgrades, using incentives of up to 50% of the installed cost and financing that is either zero- or low-interest for the rest.

CONNECTICUT CASE STUDY

The Fish family of Bolton, CT took advantage of SBEA incentives, assistance, and loan funds to save energy via lighting and refrigeration measures, as well as installing a variable frequency drive (VFD) on their milking machine motor to save energy. The combination of incentives and financing meant the project paid for itself with no money down (Energize CT 2015).

Pepco piloted the Small Business Energy Advance program in 2014, reaching 453 committed loans for a total of $1.46 million in the program cycle. Although this indicates the average loan was only about $3,200, the program attracted strong participation at that time, with more than 8,200 customers in the utility's small business energy efficiency program during

the last six months of 2014. Business types included restaurants, retail, multifamily, convenience stores, health care facilities, offices, schools, and faith-based organizations. However, while there were custom, HVAC, refrigeration, commercial kitchen, and lighting projects, 90% of savings was from lighting measures (Pepco 2015).

OFFER A WIDE SET OF ELIGIBLE MEASURES

While leading and long-running programs continue to achieve the majority of savings from lighting measures, these same programs offer a greater selection of measures, for more end uses, compared with smaller and newer programs. Offering additional technologies and types of measures opens up the possibility for deeper savings per project and for achieving a higher percentage of the business energy efficiency savings potential.

Developing and delivering broader measure offerings, while continuing to expand program participation and to install efficient lighting products, is critically important for the future of small business programs. Pepco, which has one of the largest programs in terms of total spending, described "achieving higher savings per project by increasing the installation of measures beyond lighting" as *the* primary challenge for its 2015–2017 program cycle (Pepco 2014).

Since the majority of all energy consumption in small business is for end uses other than lighting, it is not possible for programs that offer only lighting measures to achieve truly deep, comprehensive savings. As Consumers Energy's success with its targeted programmable thermostat initiatives demonstrates, it is possible for programs to capture incremental energy savings beyond the tried-and-true lighting measures. This can be done with high cost effectiveness: the overall benefit cost ratio for Consumers Energy's small business programs, including both electric and gas, was 6.36 using both the utility cost test (UCT) and the total resource cost test (TRC) (EMI 2015).

Refrigeration in particular is a major energy user in restaurants, grocery stores, convenience stores, and warehouses. For commercial buildings of all sizes used for food sales, refrigeration uses 43 of 61 billion kWh, or 70% of all electricity use, compared with 5 billion kWh (8%) for lighting (EIA 2016). For grocery stores, refrigeration is 44–57% of total electricity consumption (Billhymer et al. 2016).

After lighting, the primary end uses for which programs offer measures are refrigeration and HVAC. Multiple program managers, implementation contractors, and other experts we interviewed said these are the up-and-coming areas, as demonstrated by program plans and budgets. Some energy efficiency measures in utility programs eligible for financial incentives include efficient walk-in coolers, door heaters, refrigeration lights (such as LED display case lights), evaporator fan controls, anti-sweat controls, night covers, strip curtains, door gaskets, and door closers. Increasingly available HVAC measures include programmable thermostats and rooftop unit (RTU) tune-ups.

PROVIDE DEDICATED PROJECT PROCESS MANAGERS

Dedicated account representatives, which utilities typically provide for larger C&I customers, are another way to guide small business owners through a full energy efficiency project with deep savings. In such an approach, a designated person within the utility

program or employed by an implementation contractor or local partner organization walks the business through all its energy-saving options. The tradeoff for greater savings is an increase in administrative costs.

One example is the Your Energy Manager (YEM) program, an initiative of East Bay Energy Watch, a partnership between Pacific Gas and Electric and Alameda and Contra Costa Counties in the San Francisco Bay Area. The implementer is a nonprofit organization, Community Energy Services Corporation, which also runs a more traditional small business lighting program called Smartlights. The YEM idea originated with small businesses asking for energy efficiency beyond lighting and refrigeration. They wanted HVAC and building envelope improvements but lacked the level of expertise needed. Instead of providing additional measures or rebates, the solution was to provide staff through a pilot of Your Energy Manager in 2015.

YOUR ENERGY MANAGER CASE STUDY

Global Quality Foods identified a large demand spike (>100 kW) that occurred only a few times a year but cost the client significantly due to time-of-use rates. It was found to be due to the electric vats used to cook crabs. YEM load-shifted crab cookers to overnight hours and also found a billing error for metered demand that resulted in an $8,000 credit to the client (McElvery 2015).

Now in its second year, YEM has found initial success providing non-lighting measures to small business customers with approximately 100 kW average demand. For example, several participants have two or three five-ton packaged rooftop HVAC units. The pilot program provided energy end use analysis with benchmarking using Energy Star Portfolio Manager and other methods, and continued monitoring energy use. It also trained energy champions at the business to ensure continued improvement in energy savings (McElvery 2015).

Another initiative in the same vein is the Small Business Energy Coaching Partnership noted earlier, a pilot project serving the Lake Street corridor in Minneapolis, a geographic area targeted as underrepresented in terms of participation in utility programs. The energy coach model encourages recruitment of coaches from local business associations rather than from the program or its implementation contractor. The role of the coach is to complement, not replace, the energy experts. In addition to working closely with customers on energy assessment, the coaches help them understand energy efficiency language and technical issues. In some cases, where the business owner's first language is not English, coaches translate for them in communication with utility program staff members (Drake 2014).

ESTABLISH PARTNERSHIPS

Business groups and trade associations say that small business owners have an unmet demand to cut energy costs. They see energy expenses affecting their bottom line but do not see how to achieve the energy savings they want (Jaffee and Doucette 2013). In some utility

service territories and among some types of small businesses, the utility is regarded as the credible source for energy information.[8]

In many other areas, however, what has worked better than utilities acting alone has been the formation of partnerships between utility programs and local business groups. The small business advocates serve as the messengers and conduct energy efficiency outreach to utility small business customers. These partnerships are with local organizations such as chambers of commerce, downtown business associations, local government, and nonprofits, working in collaboration with the utility program. The YEM program described above, in addition to being implemented by a local nonprofit organization that businesses are familiar with, is housed within PG&E's Energy Watch. The Energy Watch programs are partnerships themselves between PG&E and municipal governments.

Another small yet illustrative example is the Ann Arbor, Michigan, Downtown Energy Saving Grant Program offered by the Ann Arbor Downtown Development Authority (DDA). The program provided free energy audits and rebates for energy efficiency upgrades. While it was paid for with tax dollars and parking revenue from the city, what is notable is that it has provided a highly reliable route to shepherd small businesses to participate in the DTE Energy Conservation program. The energy audits educated participants about rebates available through DTE and assisted them in filling out the forms. According to a representative of the DDA, "100% of our participants utilized utility rebates, and most would not have done so without participating in our program" (D. Konkle, energy programs director, Ann Arbor DDA, pers. comm., July 21, 2016).

Local groups are central to the outreach strategy of the New York State Energy Research and Development Authority (NYSERDA) in its small business energy efficiency efforts, particularly its audit-only program. NYSERDA is a third-party program administrator, but its approach is comparable and relevant to IOU programs. Community-based and constituency-based organizations, in addition to local chambers of commerce, are on the front lines of NYSERDA's communications.[9] Its Energy Audit Program links small businesses and not-for-profit organizations with low-cost financing for energy upgrades through the Green Jobs–Green NY Small Business and Not-for-Profit Energy Efficiency Financing Program.

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[8] For example, in the Eversource pilot discussed above, the utility tried a variety of outreach approaches, including using students from local colleges and neighborhood groups. The approach that achieved the highest participation rate, however, was when the utility used its own staff, wearing Eversource garb. The conclusion drawn was that the utility was a recognized and long-standing institution in the city, with obvious energy expertise, and that it would be around to stand behind the project it was promoting. This was not viewed as an affirmation of affection for the regulated utility but merely the practical conclusion that Eversource had expertise and that consumers could have leverage with the institution if they had issues or complaints.

[9] Some of the organizations are People United for Sustainable Housing (PUSH) Buffalo, Pathstone Energy Services, Long Island Progressive Coalition/Power Up Communities, RUPCO (formerly the Rural Ulster Preservation Company), El Puente, Asian Americans for Equality, Adirondack North Country Association, Neighborhood Housing Services of Jamaica, and Neighborhood Housing Services of Staten Island.

Partnerships with local chambers of commerce in particular can add a trusted voice to steer small business to participate in utility energy efficiency programs. The national organization Chambers for Innovation and Clean Energy includes a list of best practices for chambers of commerce. The top two recommendations are: "Share information on incentives and rebates" and "Encourage and help members utilize existing incentives" (CICE 2016a). The Minnesota Chamber of Commerce's Energy Smart program not only provides free energy efficiency site assessments and helps business owners find contractors, but also is explicitly designed to connect businesses to financial incentives (Minnesota Energy Smart 2016).

Among the largest and longest-running programs provided by a small business group is that of the Greater Cleveland Partnership and the Council of Smaller Enterprises (COSE). COSE is one of the largest regional small business organizations in the United States. For almost 20 years it has been providing efficiency and other energy-related services including energy assessments, advocacy for lower electricity and natural gas rates, and a loan program to support energy efficiency retrofits. These qualities contribute to its capacity to guide Ohio businesses to utility energy efficiency programs, where they collected more than $13.4 million in rebates and other assistance in 2012 (CICE 2016b).[10]

Partnerships with local groups appear to be most successful where the partnering group adds a level of trust to, or gains additional entrée for, the program administrator. The ideal partner is one that will provide services simply as an added benefit to its members. Compensated partnerships without outside funding can add to program costs unless partners are compensated only for incremental increases in program savings attributable to their efforts.

Emerging Program Models and Features

Pay-for-performance program design and the proliferation of online customer engagement tools are important emerging trends, according to the program implementation contractors and vendors we interviewed for this report.

PAY-FOR-PERFORMANCE

The pay-for-performance model evolved from the energy savings performance contracts used by energy service companies (ESCOs). It has elements comparable to traditional prescriptive lighting programs but offers additional advantages.

In this model, the program implementer does a customized savings estimate for each project based on wattage, a customer interview, and a contract executed with the utility based on a rate per kWh saved, with pre-negotiated prices for each measure. In contrast, the traditional approach uses averages among many customers to set prescriptive rebates, such as a set dollar amount per efficient lamp or a maximum percentage of the installed cost of the lighting measures. Because the implementation contractor is paid for each kWh saved at a

[10] 2012 is the most recent year for which data are available. Dominion is not providing energy efficiency rebates, and First Energy rebates have been on hold over the past two years.

rate that has been negotiated with the utility, they are able to present a range of measures to the small business.

The pay-for-performance model has three primary benefits that differentiate it from traditional prescriptive small business energy efficiency programs:

- The utility has less risk, because administrators are buying actual energy savings at an agreed-upon price.
- The contractor can be vertically integrated, which streamlines the entire process, saving the business owner time and resources. Services can include contracting out labor, buying the efficient products, standardizing bulk procurement to ensure quality, and hiring local electricians.
- The customer has more measures to select from but does not have to shop for contractors or choose among multiple competing offers.

The pay-for-performance model has been adopted by many of the largest utility small business programs, including those offered by National Grid, Central Hudson, NYSEG, RG&E, Duke Energy, and PSE&G. Lime Energy runs pay-for-performance programs for many utility leaders in energy efficiency around the country, and this has been a factor in the company's growth into one of the largest small business program implementation contractors.

One downside to the pay-for-performance approach is that it can tend to encourage a vendor to install only the measures with the quickest payback (e.g., lighting). This could lead to lost energy or demand savings opportunities in areas such as refrigeration or HVAC. How the model could be adapted to capture more measures for additional end uses is a topic for further research.

ONLINE ENERGY ASSESSMENTS AND RECOMMENDATIONS

One recent trend among many small business programs is the proliferation of online software products and services that address the structural challenges to advancing energy efficiency for small business. These may be pilot projects that allow businesses to compare their energy use to that of other businesses (similar to home energy comparison reports) and give energy management tips, or they may offer more extensive and advanced products and services. Examples include the following.

Baltimore Gas and Electric (BGE) is rolling out its Small Business Energy Reports Pilot to 10,000 selected customers. By logging in to their BGE online account, customers can track their energy use on an hourly basis; get personalized paper and online reports comparing their usage with that of other businesses; receive recommendations for free, low-cost, or larger energy-saving measures; and make a plan to save energy (BGE 2016a).

BC Hydro's Power Smart Check-Up Pilot employs EnerNOC energy intelligence software that uses billing data to provide bimonthly reports on energy use, compares it to peer businesses in similar industry segments, benchmarks these data to track changes over time, and recommends ways to save money and energy (EnerNOC 2015).

BC HYDRO CASE STUDY
An art studio customer followed a personalized recommendation made online to remove excess lighting. The customer cut energy use by removing half the lamps in each fixture, and by the end of 2014, electricity costs were down 10% compared with 2013.

Consumers Energy also works with EnerNOC to provide the Energy Check program, which, like the examples above, offers energy use analysis, comparisons, and recommendations. Comparable small businesses are identified by industry, business type, location, outdoor temperatures, operating hours, approximate square footage of the business premises, and other building characteristics (Consumers Energy 2016).

It is too soon to assess the efficacy of these approaches within the challenging small business sector, because public data on energy savings from online assessments that lead to actual installed measures are not yet available. But it will be interesting to see how these efforts turn out.

CUSTOMER ENGAGEMENT TOOLS AND INTEGRATED MARKETING ANALYTICS

A few utilities with established programs have developed online audit tools comparable to those described above as part of comprehensive customer engagement platforms integrated with the utility's other customer data. These tools can be used for deeper analytics to more precisely target marketing and outreach, refine rebate levels, identify new measures, and evolve program offerings and delivery over time. Two examples are EnergySavvy's Business Online Assessment, which National Grid has recently begun to employ, and platform vendor C3 IoT's work with Eversource in Massachusetts.

The Business Online Assessment provides a customized experience for the small business customer, tailored for a utility's programs and branding. Many of these customers are directed to small business direct install programs, but they also may qualify for other commercial and industrial prescriptive rebate programs. Through a survey, customers indicate which programs or measures they are interested in, and the program staff follow up with the customer to enroll them in the appropriate program. Early results indicate that over two-thirds of the customers complete the survey, providing the utility with essential information for targeted follow-up. EnergySavvy has the Business Online Assessment running in six states and will be adding two more soon.

CUSTOMER EXPERIENCE

The business owner goes to the utility-branded tool and enters their business name, which is confirmed on Google Maps, and begins the online survey about their business and energy use. Survey questions ask for information about their energy end uses—lighting, HVAC, motors—and their space, such as approximate square footage and if their business occupies the entire building. After the survey, the system provides them a report and recommendations, which include energy efficiency program offerings from the utility. Each of the recommended measures comes with the expected energy savings, which can be customized to use the appropriate state technical resource manual (TRM) for calculations. The customer is presented with an individualized shopping cart, which includes the financial incentives and services from the applicable utility energy efficiency programs.

From National Grid's perspective, the platform is helping the utility engage 130,000 small business customers in Massachusetts and Rhode Island by educating them on energy efficiency and its program offerings and getting them to the right program for their business. By including not only direct install, but also other efficiency programs, it is hoped that business owners will adopt more measures with higher savings, such as HVAC improvements or furnace replacements. Using multiple marketing methods such as email and direct mail to drive customers to the website, this could be a low-cost method to increase participation and achieve deeper savings through installing more measures per customer.

Eversource Energy implemented an online energy audit tool with C3 IoT because direct install efforts were not cost effective for very small businesses and microbusinesses. Consider a business using 4,000 kWh. If it saved 10% of that through the program, the dollar savings would not even be enough to pay for an auditor to go out and do the assessment in the first place. An online audit tool that business owners can use on their own to find measures they can self-install cuts those costs and can be scaled up to reach more small business customers.

Eversource has integrated data from multiple existing IT recordkeeping systems so the utility can better understand how its 250,000 small business customers consume electricity and natural gas. One intention moving forward is to integrate data from smart devices at the business facility such as smart thermostats, which may then be analyzed to produce more optimal recommendations for efficient equipment and other measures to drive energy

savings. The software can collect real-time data that Eversource can then combine with meter readings, data from customer billing systems, and other marketing information. On the utility side, the platform includes data visualization, intelligence on energy usage patterns and costs, and email marketing elements.

On the customer-facing side, the small business customer can go to the site and, as with the other web-based pilots noted above, can learn more about the business's energy use patterns, see its energy use benchmarked against similar businesses, and get recommendations through a "Ways to Save" feature. The system is pre-populated with any efficiency measures the business has already installed through Eversource, to avoid redundant recommendations. Customers generally answer about 30 questions about their business on the site; the more information they put in, the more specific and actionable the output. However they do not have to answer any questions for it to work. It will already have information such as the nature of the business and what types of end uses and efficient technologies are appropriate for that subsector.

From the utility perspective, providing these tools can be an important and foundational step forward for small business energy efficiency. When small business owners start with an online tool like these, they are engaged, increasing the likelihood they will install efficiency measures. This gives program managers highly relevant information about their customers, such as which measures are—or are not—being installed by each subsegment and type of business. As more and more customers use the tool, program marketing can be more targeted and intelligent and drive more participation and energy savings. The next wave will be to further integrate the utility's customer-facing processes to make more of them digital and barrier-free for customers. Beyond that, program services and design ideas that are currently not offered may come to the surface—for example, working with trade allies or equipment vendors that can install energy efficiency measures at night, so the business does not have to shut down.

Remaining Challenges

While there are numerous possible areas for improving small business energy efficiency programs, two warrant mention because they represent ongoing structural barriers for existing program models—and suggest opportunities for innovation.

ACQUIRING SIGNIFICANT NATURAL GAS SAVINGS

Achieving the installation of major natural gas-saving measures poses significant challenges for program design, delivery, and implementation. Some natural-gas saving energy efficiency measures can be a fit for gaining marginal savings in the context of a direct install program model. Faucet aerators, pre-rinse spray valves, and low-flow showerheads, which reduce natural gas used for heating water by reducing water use, are typical examples. Pipe wrap, for adding insulation to hot-water pipes, is another. Most of the savings from small business energy efficiency programs, however, are on the electric side, and approximately 90% of that is from lighting measures.

Barriers to acquiring significant natural gas savings include the following:

- The gas measures and equipment that contain the greatest savings potential tend to be large, unique, and expensive items, such as furnaces, hot-water heaters, and building envelope retrofits. These are more expensive capital investment items that may require custom modeling of a building's energy use, in which case they do not lend themselves to the streamlined small business delivery models that have been so successful and cost effective.
- For these measures to be cost effective to the utility, customers often need to pay a larger share of the gas equipment cost than they are accustomed to paying for electric energy efficiency measures. Customers are usually loath to replace expensive appliances that they perceive as still working.
- Small businesses that lease their space do not have control over natural gas equipment and building-wide systems, and only a small number of them may have energy-efficient or energy-aligned leases with the building owner.
- Trade allies doing audits and installations in most small business programs tend to be electricians and do not have expertise or training in natural gas equipment, so more contractors would need to be involved, reducing the time and convenience benefits to the business owner of working with an efficient one-stop program with a single point of contact.

Perhaps a greater barrier still is that many utilities are single-fuel, which creates numerous structural, administrative, and business hurdles to overcome in providing integrated gas and electric efficiency for small customers. Even for a combination or dual-fuel utility, its service territories for electric and gas may not overlap, requiring coordination with another utility and adding complexity to program delivery. Action is being taken on gas–electric integration of small business programs for single- and dual-fuel utilities, but major progress has not yet been demonstrated in program results. This has been an ongoing focus area for program administrators at Massachusetts utilities like National Grid and Eversource, which operate some of the longest-established gas and electric small business programs, and gas–electric integration has improved noticeably there in recent years.

The overall marketing structure of the utility's energy efficiency portfolio can be another hurdle. For statewide C&I programs, Eversource in Massachusetts approaches potential energy efficiency program participants by size and by market segment, not fuel type. For small business, energy assessments and installations are led by the electric utility, but they cover electric, gas, and oil measures, with a periodic cost reimbursement true-up with the other fuel providers for measures installed (Nowak, Kushler, and Witte 2014).

Identifying promising approaches to acquiring significant natural gas savings for small business customers, and designing programs to incorporate them, is a topic needing further research.

SPLIT-INCENTIVE BARRIER

The split-incentive barrier, or owner–tenant issue, is another challenge small business programs face, and it impacts customers that lease their facilities. Often a program administrator treats a building owner or landlord as a large commercial or industrial

customer, especially if the building is master metered.[11] This has historically ignored the small business customer, the tenant. This issue surfaces in strip malls, midsize office buildings, and high-rise commercial real estate properties with offices and small retail business tenants.

One strategy aimed at breaking through this barrier is energy-aligned leasing, also called green leasing or high-performance leasing.

In commercial real estate, leases are written as gross or net. With gross leases, energy costs are allocated among tenants by square footage, not usage. In net leases, the situation is the classic split-incentive problem: the tenant pays for energy costs, but the building owner controls the energy efficiency of the building systems and has no incentive to invest in increased efficiency (IMT 2016a). Without working with the building owner, the tenants' opportunities for increasing efficiency are therefore limited to installing measures within their leased premises, such as lighting, computers, and other plug-load equipment. In either case, the tenant has no direct incentive to maximize energy efficiency.

To address this, provisions of an energy-aligned lease identify and allocate responsibility regarding energy use in terms of ongoing maintenance, upgrades, and sharing of costs and benefits of capital improvements that save energy, usually with explicit clauses addressing energy efficiency. The Cleveland Energy-Aligned Leasing Program, a two-year effort by the Institute for Market Transformation (IMT) in partnership with COSE, is one example of organizations other than utility programs using this approach. It was an extensive effort; they worked with 60 owners and tenants occupying 7 million square feet of commercial real estate (IMT 2016b).

The extent to which energy-aligned leasing can capture energy-saving opportunities that otherwise would be lost, and how much this approach may drive participation in utility small business programs, have yet to be determined.

Conclusions

Essentially all of the consistently high-performing electric and dual-fuel utility small business programs offer lighting rebates. This continues to be an important strategy. The best programs are constantly examining ways to add more measures, both electric and gas, to their mix of offerings and to encourage more comprehensive installations. These programs are delivered through direct installation contractor models or other approaches that keep participation as simple and easy for customers as possible.

While a straightforward approach focusing on lighting can be an effective quick start for new programs in less mature efficiency markets, in the long run it can capture only a fraction of the potential energy savings. Lighting is only one among many electricity end uses, and it does not address natural gas use at all. However a lighting direct install or other

[11] In master-metered buildings, the building owner is the utility customer, in contrast to submetered or individually metered units, in which energy use can be tracked and billed to tenants separately.

streamlined model can begin to establish the necessary local program delivery infrastructure and utility experience that provide a foundation for later expansion.

Fortunately, leading programs around the United States and Canada have demonstrated strategies for engaging more small businesses in multiple subsectors, with more diverse measure mixes that provide a broader array of services, customized to better meet customer needs.

They are accomplishing this by addressing barriers to participation while enhancing program benefits and ways in which those benefits are communicated. Segmenting the small business market, then targeting communications and delivery channels to serve those market segments, makes program offerings more relevant. Pairing high rebates with low- or zero-interest financing makes efficiency accessible and profitable. Structuring contracts with implementation contractors or other partners to reward performance (i.e., saved energy) incentivizes efficient delivery. Providing technical assistance and education through partner organizations, dedicated energy managers, and qualified trade allies raises awareness, not only of energy efficiency benefits, but also of how to work with program procedures. Assuring that these partnerships reward savings, and not just activity, maintains overall program cost effectiveness. Testing and incorporating a wider set of energy efficiency measures for lighting and other end uses provides business owners with greater variety and choice and the possibility for deeper savings.

There is no single best model for small business energy efficiency program design. We recommend that portfolio and program managers consider the proven and emerging practices for serving small business customers we have identified here and adapt them to suit utility objectives and energy efficiency portfolio priorities.

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Appendix A. Program Descriptions as of 2014–2015

State	Utility and program	Description
R	Entergy Arkansas Small Business Program[1]	The Small Business Program is offered to commercial customers with less than 100 kW of peak demand. Certified participating contractors (trade allies) provide no-cost energy assessments to identify qualifying energy efficiency improvement projects and install cost-effective energy-saving equipment. Incentives for these projects are passed directly to the customer on the contractor's invoice, or the customer may choose to receive the incentives directly. Trade allies or customers are paid from the incentive budget after reporting and quality assurance/ quality control are completed. Small business program participants may also take advantage of no-cost direct install measures, including low-flow showerheads, low-flow faucet aerators, pre-rinse spray valves, compact fluorescent lamps (CFLs), and vending machine controls (vending misers).
AZ	Tucson Electric Power Company Small Business Direct Install Program[2]	The program is an upstream market program, providing incentives directly to contractors for the installation of selected high-efficiency lighting, motors, HVAC, and refrigeration measures. The incentives are set at a higher level for this market in order to encourage contractors to market and deliver the program, thus offsetting the need for TEP marketing and overhead expenses. In order to further reduce overhead expenses, the program has employed Internet-based measure analysis and customer proposal processing, which has made the process easier for both contractors and customers. The program includes customer and trade ally education to help them understand the technologies being promoted, the incentives offered, and how the program functions.
CA	SCE Commercial Direct Install[3]	The Commercial Direct Install Program delivers free and low-cost EE hardware retrofits through installation contractors to reduce peak demand and energy savings for small and medium-size commercial customers. The program targets small and medium businesses in a staged delivery approach that provides program services in specific geographic areas at different times, allowing for a more concentrated and directed program.
CA	PG&E Direct Install Commercial Direct Install Subprogram [4]	PG&E's Direct Install offerings are administered through the utility's Third Party and Government and Community Partnership programs. These programs provide small business customers with the opportunity to have a third-party contractor retrofit existing systems with energy-efficient systems at low or no cost to the customer. Given that many small business customers have short-term leases and a split-incentive barrier (where the customer or business owner does not own the equipment he or she pays bills for), this program is an effective way to address the needs of this sector and overcome the barriers of limited capital, lack of expertise, and lack of understanding of EE benefits.
CO	Xcel Energy CO Small Business Lighting[5]	The Small Business Lighting product offers free lighting audits, recommendations for energy-saving measures, special services, and attractive cash rebates to business customers who purchase and install energy-efficient lighting equipment in existing facilities. The product is available to businesses with peak demand of up to 400 kW. It seeks to overcome barriers that often prevent small businesses from investing in energy-efficient lighting, including limited financial resources and time, low awareness of lighting equipment, and lack of access to quality contractors.

CT	Small Business Energy Advantage (United Illuminating and Eversource CT)[6]	Historically the emphasis in describing the SBEA program has been on the core program of turnkey services with substantial incentives and no-cost, cash-flow-positive financing for the balance. However, with the shift in focus to a customer-centric approach to doing the business of administering the conservation and load management (C&LM) programs, the companies now also emphasize that SBEA-eligible customers may access a far larger number of discrete actions and initiatives, including the totality of special initiatives such as the engagement of the state's Lead by Example and Energy Services Performance Contracting efforts under the SBEA Master Agreement, the National Accounts initiative, the grocery initiative, and the companies' mid- and upstream offerings.
IL	ComED Small Business Energy Savings[7]	The SBES program is designed to help qualified ComEd nonresidential customers achieve electric energy savings. It does so by educating them about energy efficiency (EE) opportunities through on-site assessments conducted by specially trained trade allies and installation of no-cost direct-install measures. Further savings are available to participating customers through incentives of 30–75% offered for select contractor-installed measures.
LA	Entergy New Orleans Small Commercial Solutions[8]	The Small Commercial Solutions Program is designed to provide assistance and financial incentives for the installation of certain energy efficiency measures that reduce energy consumption in small commercial facilities. All commercial customers who have an average peak demand of less than 100 kW can participate in the Small Commercial Solutions Program. For the fourth year in a row, the majority of program participants installed more efficient lighting. In most cases, these lighting projects, combined with the incentive, yield business owners a return on their investment in less than two years. For those participating businesses, energy savings enable them to invest in the company's growth or enjoy a higher profit margin.
MA	National Grid C&I Direct Install and Eversource C&I Direct Install[9]	The program administrators coordinate small business as part of statewide joint programs under Mass Save. The Small Business Core Initiative provides a simple, streamlined path for these customers to reduce their energy use and for the Commonwealth to acquire the energy savings cost effectively. The Core Initiative is designed to provide seamless, full-service delivery for small business customers—from opportunity identification (the audit) to turnkey installation of measures, to financing of the customer's share of the project cost.
MD	Baltimore Gas and Electric Small Business Energy Solutions[10]	The program provides cash incentives, free energy savings assessment, and technical assistance. Prequalified contractors schedule installation at the customer's convenience. Some incentives cover up to 80% of the program-estimated installed cost. Small Business Energy Advance zero-interest financing results in no out-of-pocket payments for qualifying projects; the customer's 20% cost contribution can be paid back on its utility bill over 12 monthly payments.

MD	Pepco Small Business Program[11]	The program provides cash incentives, free energy savings assessment, and technical assistance to businesses, nonprofits, faith-based organizations, and government customers that have a monthly demand of 100 kW or less over a 12-month period. Experienced trade allies install up to $250 of recommended low-cost measures. Some incentives cover up to 80% of the program-estimated installed cost. Small Business Energy Advance zero-interest financing is available to assist with the customer's share of project cost, with repayment included on the monthly Pepco statement.
MI	Consumers Energy Small Business Solutions Program[12]	The Small Business Solutions Program includes several initiatives: 1. Direct Install Core Program 2. Programmable Thermostat Program 3. Hospitality Initiative 4. Drop-Ship Lighting Initiative 5. Buydown Lighting Initiative.
SC	Duke Energy Progress Small Business Energy Saver[13]	The program targets improvements in lighting, refrigeration, and heating/ventilating/air-conditioning. All program services are provided by a company-authorized vendor that will solicit participants, complete and provide nonbinding site surveys at no cost to the customer, and provide a Small Business Energy Saver Program Participation Agreement that states the scope and cost of the proposed improvements. Upon execution of this agreement by the customer, all work will be performed by independent contractor(s) selected by the company-authorized vendor. The vendor shall warranty all parts and labor. Small Business Energy Saver includes: CFL-Screw In, High Performance T5/T8, LED-Exit Sign, LED-Hardwired, LED-Screw In, Metal Halide, T5/T8 Fixture, Lighting 8760, Lighting Daylighting, Lighting Dusk to Dawn, and Refrigeration.
TX	Oncor Small Business Direct Install MTP[14]	Oncor's Small Business Direct Install (SBDI) is a market transformation program (MTP) designed to offer contractors and customers education on energy efficiency technologies, equip participating contractors with the tools they need to succeed in installing projects in the small business market, and offer incentives to help small (less than or equal to 100 kW) and very small (less than or equal to 10 kW) businesses install energy-efficient products such as high-efficiency lighting and refrigeration measures. The program is focused on the non-metro counties served by Oncor.
WA	Puget Sound Energy Small Business Direct Install[15]	Based on the success realized in the previous year, the Small Business Direct Install (SBDI) program conducted four community blitz campaigns in 2014, engaging small business customers in Kent, Cle Elum, Bellingham, and Lacey through door-to-door efforts. The Energy outreach staff were key contributors to the effort's success. During the blitz activities, a total of 230 small businesses received on-site energy efficiency assessments, direct installation of efficiency measures, and in some cases additional retrofit installations requiring electrical permits, all at no expense to the businesses.

Sources: Program annual report filings as follows. [1] Entergy Arkansas 2015. [2] TEP. [3] CPUC 2016. [4] PG&E 2014. [5] Xcel 2015. [6] CEEF 2016. [7] Higgins, Ampong, and McDowell 2016. [8] Entergy New Orleans 2015. [9] National Grid 2015b. [10] BGE 2016c. [11] Pepco 2016a. [12] EMI Consulting 2015. [13] Duke Energy Progress, Inc. 2014. [14] Oncor 2014. [15] PSE 2015.