

Successful Practices in Combined Gas and Electric Utility Energy Efficiency Programs

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August 2014

Report U1406

© American Council for an Energy-Efficient Economy
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Acknowledgments

This report was made possible through the generous support of the American Gas Association, Northwest Energy Efficiency Alliance, Energize Connecticut, Southern California Gas, and the Los Angeles Department of Water and Power. The authors gratefully acknowledge external reviewers, internal reviewers, colleagues, and sponsors who supported this report. External reviewers included Scudder Parker from Vermont Energy Investment Corporation, Sheri Borrelli from United Illuminating, Gretchen Hardison from Los Angeles Department of Water and Power, Doug Baston from North Atlantic Energy Advisors, Rick Murphy and Mariam Arnaout from American Gas Association, and Chris Neme from Energy Futures Group. Internal reviewers included Steve Nadel, Neal Elliot, and Dan York. External review and support does not imply affiliation or endorsement.

The authors also gratefully acknowledge the individuals who helped us by agreeing to be interviewed as program experts: Ian Hoffman, Lawrence Berkeley National Laboratory; Doug Baston, North Atlantic Energy Advisors; Chris Neme, Energy Futures Group; and Scudder Parker, Vermont Energy Investment Corporation.

We would like to thank the many program managers and staff members of utilities and program administrators around the nation who cooperated with us on this project and provided the necessary data and answers to our many questions.

Last, we would like to thank Fred Grossberg, Kate Hayes, Jennifer Hutchinson, and Roxanna Usher for editing, Eric Schwass for graphics support, and Patrick Kiker for his assistance in the publication process. Their efforts helped make this report possible.

Executive Summary

The most typical approach to utility energy efficiency program delivery has been for electric and natural gas utilities to operate their own separate programs. Unfortunately, this approach misses opportunities for cross-fuel coordination that can save energy and money.

In contrast, combined natural gas and electric energy efficiency programs can create efficiencies and synergies that deliver energy and dollar savings at lower cost to utilities and consumers while enhancing customer satisfaction. Many leading dual-fuel programs are able to capture these benefits. We found exemplary combined programs – residential, commercial, and industrial – in leading states in every region of the country.

This report does not attempt a comprehensive national review of combined gas and electric programs. Rather, we include a number of case studies of programs from around the nation as illustrations of successful approaches and models for emulation.

For this study we also reviewed research literature and interviewed program experts. Through these efforts we identified a number of challenges and issues surrounding combined programs, and we discuss these aspects in the report.

One of the challenges involves utilities' concerns about collaborating with each other. For example, programs that may affect a customer's choice of fuel type may give rise to cross-fuel competition. Tensions and competition may also arise between the electric and gas divisions of combination (dual-fuel) utilities. Another barrier to establishing combined programs is the administrative effort required for coordination among gas and electric utilities or divisions within the same organization. Still another hurdle is utilities' reluctance to lose some of the marketing benefits they enjoy from being the sole sponsor of an energy efficiency program.

Regulations and the posture of state regulators can also impede the formation and smooth operation of gas-electric energy efficiency programs. Commissions usually focus on each electric and gas utility as a separate entity. The coordination or integration of multiple fuels in a single program can add complexity to the regulatory process, particularly in developing program plans, filing, approvals, timing, jurisdiction, and reporting. Two separate regulatory bodies may be involved in some cases. Imagine an investor-owned gas utility that reports to the utility commission partnering with a municipal power company that answers to its city council.

Program administration presents another set of issues. Single-fuel utilities considering joining forces to administer a gas-electric program may find an imbalance in the capabilities that each brings to the partnership, including differences in size, funding, corporate culture, and energy efficiency expertise. Tracking of costs and attribution of benefits will both require attention and negotiation. Adding to the recordkeeping and reporting burden is the fact that regulators generally want to see program costs and impacts reported separately. Measuring cost effectiveness is a related consideration. In particular, the level at which cost effectiveness is screened – whether by measure, project, or program – can have major implications for program design and administration.

These challenges may be compounded by the integration of combined gas and electric programs with other resources such as water or deliverable fuel efficiency. Two earlier ACEEE research reports address water and energy integration.¹

Our review indicates that the top-performing states in terms of overall energy efficiency program results (as ranked in ACEEE's annual *State Scorecard*) tend to have the most robust laws, regulations, and policy structures supporting combined gas and electric programs. These states include California, Connecticut, Illinois, Maine, Massachusetts, Rhode Island, and Vermont. This report includes excerpts from statutes and regulations in these states that show explicit and sometimes sweeping support for combined programs.

Successful combined programs feature a variety of institutional arrangements. We group them into four types:

- Combination utilities (providing both natural gas and electricity)
- Integrated statewide programs administered by multiple utilities
- Third-party administrators
- Coordinated programs run by two separate (usually single-fuel) utilities

Each category encompasses some unique issues and challenges, as well as approaches to overcoming them. Appendix A includes in-depth profiles of 16 programs across the categories.

Fuel switching and combined heat and power (CHP) programs are additional specialty areas of electric and gas utility coordination that can contribute to energy efficiency program portfolios. Although these programs may or may not directly involve gas, electric, and combination utilities, they have an impact on all utilities by decreasing or increasing electric load and natural gas volume.

A carefully structured, unified internal operation is a key feature of combined programs at dual-fuel utilities. Key to the success of full statewide gas and electric program integration are communication and cooperation aimed at uniformity, simplicity, and program alignment by design. The independence and scale of third-party administrators, including statewide public benefits organizations, enable their gas-electric programs to achieve higher savings and lower costs.

¹ R. Young, *Saving Water and Energy Together: Helping Utilities Build Better Programs* (Washington, DC: ACEEE and Alliance for Water Efficiency, 2013), <http://aceee.org/research-report/e13h>. R. Young and E. Mackres, *Tackling the Nexus: Exemplary Programs That Save Both Energy and Water* (Washington, DC: ACEEE and Alliance for Water Efficiency, 2013), <http://aceee.org/research-report/e131>.

While single-fuel utilities may initially face more challenges in coordinating combined programs, they generally have the most to gain. They can succeed by establishing clear roles and responsibilities within their partnership and by working continuously to maintain coordination. Consistency and uniformity of service for all customers are similarly vital. Several successful coordinated programs noted the importance of focusing on the process of joint program design and allowing sufficient time for it.

Utility regulators have a major opportunity to facilitate combined gas-electric programs and their benefits to consumers and utilities. By encouraging or requiring gas and electric utilities to work together on combined program plans and implementation, they can motivate them to deal with the challenges and issues that otherwise might be discouraging. One way regulators might accomplish this is by inviting utilities to submit joint or coordinated program proposals.

Combined and integrated natural gas and electric energy efficiency programs generate additional energy and cost savings that in turn contribute to greater customer service and satisfaction. ACEEE recommends that states adopt clear policies advancing these programs, and that utilities and other program administrators reaching for higher levels of cost-effective energy savings pursue these opportunities.

Introduction

Utility-sector energy efficiency programs have been growing rapidly in recent years. In 2012 budgets for energy efficiency programs offered to electric utility customers totaled \$5.9 billion; total budgets for natural gas energy efficiency programs exceeded \$1.3 billion. This is an increase of more than 250% for electric and of more than 300% for gas above 2006 levels (Downs et al. 2013). Such large increases are due to the growth of existing programs and the initiation of new programs in areas where previously there were none.

Historically, the most common pattern has been for electric and natural gas utilities to operate their own programs with little attempt at integration. However, separate programs create difficulties for utility customers who want to undertake projects that save both electricity and gas. Some cross-fuel measures that can save energy and money are never implemented because it is unclear which utility should be promoting them. Separate approaches also can limit the number of measures that pass cost-effectiveness screening; measures that save both electricity and gas may fail the screening when considered separately, but they would pass if looked at as single integral measures.

Some states are moving in the direction of more integrated energy and resource systems. Recent state policy and utility portfolio trends are toward program and resource system integration, namely, the integration of load management with energy efficiency, water conservation with electric efficiency, energy efficiency with combined heat and power, and – the focus of this report – natural gas energy efficiency programs with electric. California has policies and programs for integrated demand-side management (IDSMD) of load management and energy efficiency (Woychik and Martinez 2012), as well as programs that address both water and energy. Massachusetts has both an energy efficiency resource standard (EERS) and an alternative energy standard that are required by law to work together (Halfpenny et al. 2012). Connecticut has enacted a comprehensive energy strategy (CGA 2013). The success of these leaders suggests that single-fuel programs could collaborate to capture currently untapped energy savings in many states.

Dual-fuel utilities and statewide integrated-program administrators run many successful combined and integrated programs. Such programs represent a significant opportunity for single-fuel utilities and other program administrators faced with higher EERS savings requirements. Utilities and administrators will have to confront a number of barriers in order to seize this opportunity. These barriers are not well documented, nor are the best practices in overcoming them.

The purpose of this study is to examine these barriers and best practices. In addition to describing the details of combined programs, we present lessons learned from program representatives, recommendations from industry experts, and several case studies of successful combined programs as models for emulation and expansion. We also look at the regulatory structures that make these programs possible, or at least support them, and conversely, at those that may hold them back.

We refer to energy efficiency programs that target and quantify both electricity and natural gas savings as *combined programs*. Combined programs may take different forms. We use the term *integrated* to describe programs where the implementation of the gas and electric components are unified, in contrast with *coordinated* programs run by separate utilities. More particularly, four types of institutional relationships have been found to be effective:

- Combination or dual-fuel utilities (those that deliver both electricity and natural gas to their customers)
- Integrated statewide programs administered by multiple utilities
- Single statewide third-party administrators
- Coordinated programs run by two separate (usually single-fuel) utilities

Rationale for Natural Gas and Electric Energy Efficiency Program Level Cooperation

Despite up-front investments and other challenges, combined gas and electric programs can yield greater energy and dollar savings at lower cost, and thus greater customer satisfaction, than separate single-fuel programs. These factors can be mutually reinforcing. With greater cost efficiencies, programs that would have been insufficiently cost effective can now be implemented and can offer more measures; with added convenience and deeper savings available, more customers may choose to participate; and with higher participation, overhead can be amortized over a larger number of projects, further improving cost effectiveness.

INCREASED SAVINGS IMPACT

The utility sector has a growing need for strategies to increase energy efficiency program impact. Over the last decade, state policy requirements for the energy savings and cost effectiveness of these programs have expanded in a number of ways. Many states have added an EERS that applies to natural gas and electric utilities. Twenty-five states have an electric EERS, and 13 have a natural gas EERS. Some are direct mandates for the utilities and others apply to statewide public-benefits organizations or third-party energy efficiency program administrators. A common feature of EERS policies is a stepped-up level of energy savings targets as a percentage of gas and electric sales year over year. This ramp-up in programs provided to customers by their utilities or related organizations has created an enormous demand for cost-effective program strategies that go beyond the traditional approaches.

Energy efficiency programs that include both gas and electricity measures have many benefits that are not available to standalone programs. Chief among these are the increased savings that result from programs and portfolios of larger size and greater resources. A gas-only program (or a particular gas measure or project) may not be cost effective enough to meet applicable benefit-cost (BC) test requirements, but when it is combined with electric measures as part of a dual-fuel efficiency program, the project as a whole has a high enough BC ratio to pass screening tests. Home weatherization programs are an obvious example.

The combined measure benefits of air conditioning savings (electric) and heating savings (gas) are more likely to pass the screening than single-fuel measures.

Combined programs can achieve economies of scale through the expansion of geographic and utility service territories, eligibility for additional funding streams, and access to a wider pool of utility customers and therefore program participants. Public Utility Commission Chairman Susan Ackerman's testimony to the Oregon legislature regarding Energy Trust of Oregon describes the benefits of fully integrated programs:

The Trust has met every target we've set for them over the past ten years. In short, they are doing what they've been tasked with doing. Because the Trust runs programs for four utilities, it has the advantage of economies of scale, the benefits of a singular focus and [it] can work with both gas and electric efficiencies in a single home in a way that individual utilities cannot. (Ackerman 2013)

REDUCED PROGRAM COSTS

Combined gas and electric programs provide cost efficiencies by avoiding duplication. Fewer site visits, integrated advertising and marketing, less overhead per unit of energy saved, and reduced or coordinated administration all combine to reduce the cost of the program, in turn reducing customer costs.

Programs with a single implementation contractor avoid redundant management expenses. Electric and gas programs share, or partially share, the quality control and assurance, training, and administrative costs they previously incurred separately. If they are handled for the joint program through a single entity, marketing and customer intake and processing are also more cost efficient. While combining or coordinating programs sometimes makes program managers' jobs more complex, lower operational costs and increased cost effectiveness can more than compensate.

ENHANCED CUSTOMER SATISFACTION

From the customer's viewpoint, participation becomes simpler, faster, and more advantageous. Program delivery is streamlined. Adding measures for the second fuel represents enhanced customer service. Instead of two sets of programs, vendors, and paperwork, the utility customer is now potentially dealing with a one-stop shop, under one brand, a single point of contact, and wider menus of energy savings measures, financial incentives, and integrated service. Whereas dealing with separate gas and electric programs at two utilities might have been an insufficiently attractive business case for a business customer, the return on investment from a combined program may induce the company to participate.

OTHER BENEFITS OF GAS-ELECTRIC COLLABORATION

Creating a dual-fuel program calls for researching administrative intricacies and policy requirements and then making changes to organizational structure and staffing. The time to

accomplish these tasks can be reduced by learning from the experience of a partner utility. By working with a partner rather than creating a program on its own, a utility can gain access to staff, expertise, and systems that may reduce the start-up time from approval to launch.

Integration of gas and electric may increase the diversity of the program portfolio. Importantly, some program managers cite the intangible benefits and synergies of simply having gas and electric get to know each other and work together to share expertise, customer knowledge, and program delivery experience.

Methodology

This project used several methodological approaches. We began by reviewing a variety of literature, including industry research reports and papers from professional conferences. We also conducted telephone interviews with ten utility energy efficiency experts. Among other purposes, this background research helped us identify leading gas and electric programs to profile in case studies. Our interviewees included managers of top programs, industry association representatives, and leading policy, program design, and implementation consultants. We solicited their opinion on programs to investigate or exclude from our research. There was strong consensus as to which programs, statewide efforts, and utility partnerships best illustrate successful gas-electric approaches.

We then made preliminary inquiries into those programs to help determine which of them would be most suitable for profiling. We examined a mix of institutional arrangements, including both combination utility programs (those administered by a single combined gas and electric utility), and coordinated programs (those that involve separate natural gas and electric utilities). We also expressly included examples of programs administered by non-utility (third-party) organizations. The choice of programs to profile was also based on featuring each of the major customer sectors – residential, commercial, and industrial.

For the initial programs selected, we sent program representatives a detailed template for preparing a program profile. The self-reported responses formed the basis of the program profiles. We ultimately selected a total of 16 programs to profile in this report (table 1). Those profiles are provided in Appendix A.

Table 1. Programs profiled

Program name	Utilities involved	State	Sector	Program type
Combination utility (dual-fuel)				
Large Commercial Retrofit	National Grid	RI	C & I	Commercial retrofit
Multifamily H ₂ O and Space Heating Transformation	CenterPoint Energy	TX	Res	Fuel switching
Conservation Improvement Program	CenterPoint Energy	OK	Res, C & I	Fuel switching

Program name	Utilities involved	State	Sector	Program type
Statewide program with multiple utilities				
Massachusetts' Combined Heat and Power Program	Multiple	MA	C & I	Combined heat and power
Mass Save	Multiple	MA	C & I	Integrated C&I
Home Energy Solutions with Home Performance	CL&P, UI, CT Natural Gas, SCG, Yankee Gas	CT	Res	Whole-home retrofit
Third-party administrator				
Production Efficiency	Multiple	OR	C & I	Industrial
WI FOE Large Energy Users	Multiple	WI	C & I	Industrial and institutional
NYSERDA Multifamily Performance Program	Multiple	NY	Res	Multifamily
Coordinated separate utilities				
Retro-Commissioning Program	ComEd, Nicor Gas, Peoples Gas, NSG	IL	C & I	Commercial retro-commissioning
Small Business Direct Install	LADWP (w/ SoCalGas)	CA	C & I	Small business
Home Energy Squad	CenterPoint Energy, Xcel Energy	MN	Res	Residential audit and direct install
California Advanced Homes	SoCalGas (w/ LADWP)	CA	Res	Residential new construction
EV and VGS Residential New Construction	Vermont Gas Systems, Efficiency VT	VT	Res	Residential new construction
EfficiencyCrafted New Homes	Columbia Gas of Ohio, AEP Ohio	OH	Res	Residential new construction
Home Energy Savings	ComEd, Nicor Gas	IL	Res	Whole-home retrofit

The following sections present our observations from the literature review, interviews, and case study profiles. First we describe the challenges and concerns we have identified regarding combining gas and electric programs. Then we report on and provide relevant excerpts from state statutes and regulations supporting combined and integrated programs. We provide summaries of successful program examples under different institutional arrangements, lessons learned from these programs, and a detailed appendix profiling 16 programs (see Appendix A). Profiles describe each program, the motivations for

cooperation among utilities, regulatory issues, lessons learned, and program performance data.

Challenges Encountered in Combined Programs and Barriers to Success

Despite much opportunity and potential upside for gas and electric utilities to pool their energy efficiency program efforts, significant barriers and challenges exist. Gas and electric utility decision makers have concerns related to collaboration. There are regulatory issues related to coordinating gas and electric program plans, reporting of program results, and promotional practices. There are also challenges in the administration of programs offering both gas and electric measures, including how costs and benefits are to be allocated, how cost-effectiveness screening is to be done, and how to work out the details of actual program implementation.

UTILITY CONCERNS RELATING TO COLLABORATION

Concerns About Cross-Fuel Competition

Investor-owned utilities generally have a financial incentive to increase their load, yet they may face energy efficiency savings requirements. The prospect of a combined energy efficiency program that not only decreases the utility's own sales, but also involves some promotion of a potentially competing utility, can be a sensitive subject, independent of who administers the program. One expert we interviewed candidly shared that "management of gas and electric utilities each see the other as the evil fuel, so any collaboration is with 'the enemy.'" Concerns about cross-fuel competition are particularly exacerbated in any program that might affect a customer's choice of fuel type (e.g., electric versus natural gas water heating or space heating). Another interviewee used similar language, referring to a specific electric utility, stating, "[The utility] has been at best silent on dual-fuel energy efficiency programs. They're electric focused . . . used to do fuel switching *to* electric *from* gas, in a battle with the gas utilities. There's a barrier here. It would be like sleeping with the enemy if they were to enter into joint gas and electric efficiency programs."

On the other hand, it should be noted that cross-fuel competition is not a universal barrier, or an insurmountable one. Many utility program administrators have formed combined gas-electric program partnerships in order to provide a one-stop shop for customers. The considerable dollar savings that are achieved can be passed along to customers through enhanced financial incentives.

To some degree the intensity of cross-fuel competition depends on the extent to which the parties involved on the electric and gas sides of the efficiency programs are separate utility companies operating in the same markets and service territories. Fuel switching programs in particular, such as those presented here that provide incentives to customers to replace electric equipment with gas – thus moving from a single-fuel electric utility's load to a single-fuel gas utility – could raise these concerns. Competition and tensions between the electric and gas divisions of unified utilities may also occur, particularly if the union is the product of a recent merger or acquisition of formerly separate companies, and of separate company cultures.

Some analysts have identified the emergence of potential competition stemming from the increasing efficiencies of heat pump technologies for water heaters, dryers, and ground source and air-to-air heat pumps. A related issue is line extensions of natural gas that enable conversions to gas from oil and propane. Increasingly, heat pumps are becoming competitive in these settings, and there may be stranded cost risk in extending the gas lines.

Ideally a comprehensive energy efficiency program would provide the services and measures that are in the best interest of customers and their particular circumstances, including decisions regarding fuel choice. That type of totally fuel-blind program cooperation is very difficult to achieve in practice. One program that has made progress toward that end is the NYSERDA Multifamily Performance Program profiled in Appendix A. The program incentivizes energy savings without regard to fuel type. For existing buildings, those that project at least a 20% energy reduction in the associated energy reduction plan are eligible for an additional performance payment if they meet or exceed their project's savings target. The extraordinary feature that makes this relatively independent of fuel type is that the payment is based on *source* energy usage, which applies a factor to make gas and electric energy percentage savings comparable.

Administrative Effort Required for Coordination

One hurdle utilities face when considering coordinating a gas-electric energy efficiency program is investing the necessary resources for its administration. Creating a master agreement between the separate utilities that will be used to govern the dual-fuel program (or programs, in some cases) involves an array of decisions to be made and systems to be established between the utilities. When utilities set up their structures for working together, they should address such areas as the following:

- marketing
- branding
- program design
- program website
- quality control
- treatment of confidential information
- customer communication
- technical reference manual (both content and process)¹
- accounting and funding (flow between the utilities and other entities)
- utility roles (such as which utility will be the lead on the program)
- handling of account management relationships in commercial programs
- evaluation process
- program data tracking

¹ A technical reference manual (TRM) provides conventions, methods, formulas, and default assumptions for estimating savings, cost effectiveness, or other metrics of energy efficiency programs.

- allocation of program costs and savings

Experts involved in facilitating the integration of existing separate utility energy efficiency programs all explained that, initially, the process requires a lot of work. Even a relatively simple administrative structure, such as having standard incentive forms for customers, is a potential area for negotiation. Wording, too, may need to be negotiated, as it can have an impact on marketing and customer communications. In Massachusetts, for example, electric utilities referred to the payments to program participants as “incentives,” while the gas utilities called them “rebates.” One industry consultant recalled that the companies were insistent on this issue. He said, “It was a battle.”

Customer Relations and Marketing

A utility administering an efficiency program independently, faced with the prospect of creating a joint program with one or more other utilities, may perceive that it could risk losing some of the marketing benefits it receives from being the sole sponsor of the program. The utility’s concern is that integrating programs to do something jointly dilutes the utility’s brand and the positive customer relations that come as a benefit of that.

Utilities respond to this challenge in a variety of ways. In Connecticut, the statewide integrated programs are co-branded. The statewide brand, Energize Connecticut, is an initiative of the Connecticut Energy Efficiency Fund, the Clean Energy Finance and Investment Authority, the state, and the utilities. Marketing materials feature both the Energize Connecticut logo and the utility names and logos together, as illustrated below:



In Wisconsin, large utilities are not as prominently identified. The website for Wisconsin Focus on Energy (the statewide energy efficiency program administrator) states that “Focus on Energy programs are available to customers of participating Wisconsin utilities,” and includes a page listing the participating utilities and displaying the utility logos. Focus on Energy is presented as “funded by the state’s investor-owned energy utilities and participating municipal and electric cooperative utilities,” rather than as a joint program of the utilities.

REGULATORY ISSUES

The degree of support in policy and regulation, and the overall posture of regulators, is one of the most important factors enabling the success of gas-electric efficiency in any given state. The regulatory frameworks and orders in place under which gas and electric utility sector energy efficiency programs operate can both help and hinder the existence and

expansion of dual-fuel programs. Below we discuss areas where regulatory factors are particularly important.

Coordinating Electric and Gas Programs

Regulators typically focus on each electric and gas utility as a separate entity. Electric and gas utilities commonly each have their own energy efficiency plans and often file plans and implement programs on their own specific schedules. This can create additional challenges for implementing a coordinated electric and natural gas energy efficiency program.

Program integration adds a layer of complexity to the overall regulatory process, which often leads to additional reporting and administrative burdens on the utilities and other regulated program administrators.

A scenario demonstrating this challenge is seen in the example of Massachusetts, where the statewide efficiency framework that was put in place as a result of the central piece of efficiency legislation, the Green Communities Act of 2008, has

enabled innovative collaboration, but it has also greatly increased the regulatory and administrative burden. As more has been expected of PAs [program administrators], more reporting has been required. The amount of data and information coordination among the PAs has increased, which in turn has increased the administrative burden. PAs have been successful in working with regulators to reduce this burden over time as all parties learn from the experience. Creation of consistent rebates and other materials has also created a high administrative burden. (See profile, “NSTAR Electric & Gas and Mass Save C&I Programs” in Appendix A.)

In some states, different types of utilities, such as gas versus electric, or investor-owned versus municipal, face different program planning requirements and timelines. This has an impact on the partner utility and may limit what the coordinated program can do, or when it can do it.

California is an example of how differing regulatory and policy constraints may have a disparate impact on two utilities aiming to cooperate, which may hamper the implementation of a coordinated program. Southern California Gas Company (SoCalGas) is an investor-owned utility, owned by Sempra Energy. Its partner on many coordinated gas, electric, and water efficiency programs is the Los Angeles Department of Water and Power (LADWP). To gain approval for the scope of work for an efficiency program, investor-owned gas utilities in California must apply in advance to their regulator, the California Public Utilities Commission (CPUC). The requirement for this process may constrain LADWP’s ultimate tasks and activities in a coordinated program. LADWP efficiency programs have their own planning and approval process and timeline. LADWP reports to the Los Angeles City Council and the California Energy Commission and has a more flexible, locally directed process. Nevertheless, SoCalGas and LADWP have managed to put together a very successful collaboration to deliver energy efficiency programs. (See example

profiles of SoCalGas and LADWP Small Business Direct Install and California Advanced Homes programs in Appendix A.)

The conventional practice of regulating utilities as entities in individual silos clearly adds to the challenges of achieving coordinated electric and gas energy efficiency programs. To the extent that regulators can allow some flexibility to accommodate coordinated electric and gas programs, they can be an important factor in enabling such efforts to proceed.

As described above in the planning and implementation process, regulators will want to see program costs and savings identified and reported separately for each utility. This creates special challenges for the utilities and their program implementer(s) in terms of program tracking and reporting. This issue will be discussed further in the Program Administration section below.

Promotional Practices and Cross-Fuel Competition Issues

One of the potentially sensitive areas of utility regulation involves the issue of competition between utilities for customers and load (utility sales). Most states seek to prohibit utilities from poaching customers away from other utilities, and they often have restrictions on promotional practices designed to build load. Typically, any coordinated program between separate electric and gas utilities will need guidelines and requirements for handling fuel choice issues. This issue is especially critical to address in programs that are intentionally designed to achieve fuel switching (see the section on fuel switching below).

PROGRAM ADMINISTRATION

Challenges in the area of program administration include program design and implementation, tracking of costs and allocation of benefits, cost-effectiveness screening, and funding.

Program Design and Implementation

Single-fuel utilities considering forming a coordinated efficiency program may find that their capabilities may not be equal. Referring specifically to Illinois, Robert Neumann describes disparities in depth of knowledge and program management as the number-one issue:

The most significant challenge is the difference in the age and experience of the gas utility programs compared to the electric utility programs. In addition, Section 8-103 of the Public Utility Act requires electric utilities to implement energy efficiency programs three years prior to the gas utilities (Section 8-104 of the PUA). Both sections have gradually increasing budgets for gas and electric programs to implement and procure energy efficiency. (Neumann 2013)

There are also corporate culture differences to consider. As a broad generalization, gas companies have had much more sales- and load-growth-oriented missions until recent

years, while, at least in some cases, electric utilities have now been under regulatory requirements to prioritize and acquire efficiency resources for several decades now.

There are program design decisions to be made that affect the groups of customers to be served by the combined program regarding service territories. Where customers and territories do not align, how will the program serve, for example, gas utility customers who do not have electric service from the partner utility? Or customers who do not have natural gas service at all? How will the measures be funded, savings impacts be accounted for, and costs be allocated? (We present examples of how states and utilities address these questions later under the Successful Approaches section and in Appendix A).

Contractor and vendor relationships pose another set of questions to be considered when merging two single-fuel programs, creating a new joint program, or adding the gas or electric component to an existing program. If there are two utilities and one implementation contractor, do they both manage and communicate with the implementer directly? Must all three parties be involved in making decisions, or are some small enough to assign? How often will the three meet to plan and manage marketing, or to oversee field operations?

Tracking of Costs and Attribution of Benefits

Regulators want to see program costs and impacts reported separately for each utility. This creates challenges for program implementers of combined and coordinated gas and electric programs. The attribution of energy savings and other benefits, and the allocation of costs such as program spending, are closely related issues. Utilities developing coordinated programs must consider the approaches to attribution and allocation that work best for their business objectives within state requirements.

For coordinated programs between two utilities, some of these issues are addressed in contracts with implementation contractor(s). If there are separate contracts for each utility, one approach is for each utility to receive credit for the energy saved in their fuel for those measures for which they paid an incentive. It is not always straightforward.

There are some special cases that may pose a challenge, such as joint program projects that include a measure that results in electric savings but increased gas use for a given facility. Consider a lighting retrofit in commercial building that reduces electric kWh but results in increased gas usage due to less heat from inefficient lights. Similarly, an upgrade to glazing may not only reduce summer electric cooling load but also result in gas savings from reduced heating load in the winter. How are the energy savings impacts to be attributed to the two utilities in a joint or coordinated program agreement?

However, these need not be insurmountable challenges; in fact, sometimes they are only an accounting issue. Typically, certain joint costs (e.g., marketing and administration) are simply allocated based on an agreed-upon formula (among the programs profiled in this report, the split is often 50-50). The costs of measures dedicated to a particular fuel can simply be allocated to that utility. Other costs and savings for more complicated items can usually be negotiated. One method for apportioning costs between gas and electric within a

program is to apply the ratio of the net present value of the benefits for each to the total costs. Energy Trust of Oregon and ComEd (with their gas utility partners) do it this way.

Cost-Effectiveness Screening

State policies and regulations prescribe the methods of calculating and estimating energy efficiency program cost effectiveness in almost every state. Combined electric and natural gas programs can present particular challenges, such as sorting out the cost effectiveness of a comprehensive package of measures that includes items that save both electricity and natural gas. For example, the level at which cost effectiveness is measured for screening purposes – measure, project, or program – can have major implications for program design, administration, and resulting performance. If screening is required at the measure level and a particular measure does not pass, then bundling it with other (gas or electric) measures in a single project may not be allowed, even if the total project would have been cost effective, and even if the measure may be important in terms of selling the customer on the package. For that reason, screening at the individual measure level is not recommended, whether for single-fuel or dual-fuel programs, and most states do not use that practice.

Cost-effectiveness analysis of energy efficiency programs is handled differently by different states.² Ensuring that cost-effectiveness protocols are compatible with joint electric and natural gas programs is one of the challenges for coordinated programs.

Funding

Funding poses additional questions. What if changes in available gas and electric budgets are not in line with each other? For example, if one utility's budget is being reduced, this could constrain the size of the program, even if the other utility's budget was growing, and even though there may be many cost-effective market opportunities. Coordinating not just the size but also the timing of the program budget is another of the challenges facing joint electric and natural gas energy efficiency programs.

INTEGRATION WITH OTHER RESOURCES: WATER AND DELIVERABLE FUEL EFFICIENCY

Water

Given the interrelationships of natural gas, electricity, and water use and the overlapping measures to improve their efficiency, combining efficiency programs to address them together holds the potential for greater benefits to consumers, businesses, and utilities. Measures that conserve hot water such as installing faucet aerators, water-efficient and low-flow showerheads, and kitchen pre-rinse spray nozzles serve the dual purpose of saving water along with electricity or gas, whichever is used to heat the water. Yet coordination or integration of a third resource supplier along with electricity and gas compounds the

² The cost-effectiveness tests and related practices employed by each state are presented and discussed in ACEEE's 2012 research report, *A National Survey of State Policies and Practices for the Evaluation of Ratepayer-Funded Energy Efficiency Programs* (Kushler, Nowak, and Witte 2012).

program design, regulatory, and administrative challenges. These issues are investigated in depth in two earlier ACEEE publications: *Saving Water and Energy Together: Helping Utilities Build Better Programs* (Young 2013) and *Tackling the Nexus: Exemplary Programs That Save Both Energy and Water* (Young and Mackres 2013).

Deliverable Heating Fuels

Alternate heating fuels are another resource category that can be coordinated with gas and electric programs. These include heating oil, propane, and wood. Unregulated fuels add layers of complexity to program design and implementation. Deliverable fuels comprise a significant fraction of heating fuels in several northeastern states in particular. Some of the potential benefits of energy efficiency measures when applied to heating oil, propane, and even wood heat are the same as those from gas and electric efficiency: lower customer bills, reduced air pollution, mitigation of greenhouse gas emissions, more comfortable buildings for residential and business customers, and others.

The regulation, funding, and implementation all vary, however. Gas and electric sales are regulated by the public utility commission or public service commission in most states. Deliverable fuels may be regulated by environmental agencies or not at all in the context of energy efficiency. Where included in efficiency requirements, funding sources differ. In Connecticut, for example, funding for conservation programs comes predominantly from regulated fuels. For oil and propane energy efficiency efforts, funding must be obtained from alternate sources, such as from revenues received as a result of the Regional Greenhouse Gas Initiative and the Forward Capacity Market.

Rhode Island includes heating oil in a state statute in parallel with gas and electricity. Chapter 42-140 of Rhode Island's *Comprehensive Energy Conservation, Efficiency and Affordability Act of 2006*, known as the Rhode Island Energy Resources Act, authorized, created, and established an office of energy resources in the executive department of state government. One of the primary purposes of this office was to

develop and to put into effect plans and programs to promote, encourage, and assist the efficient and productive use of energy resources in Rhode Island, and to coordinate energy programs for natural gas, electricity, and heating oil to maximize the aggregate benefits of conservation and efficiency of investments (RIPUC 2006)

Other states that deal extensively with purchased fuels are Massachusetts and Vermont. Additional details on these states are provided below.

Keys to Success for Combined Programs

Combined electric and natural gas energy efficiency programs exist predominantly where they are supported by state statute and regulation. We compiled language from and about these policies in the first part of this section. Next, we present four categories of institutional relationships in which combined programs have been effective and provide summary program examples in each.

SUPPORTIVE LEGISLATION AND REGULATION

In our review, we found it striking that the states that consistently lead the nation in energy efficiency program performance results (measured by energy savings as a percent of sales) turn out to be the ones with robust laws, regulations, and policy structures supporting the coordination and integration of gas and electric efficiency efforts. Consider that Vermont, Connecticut, California, and Massachusetts are all in the top five in the country in electricity savings as a percentage of energy sales according to the *2013 ACEEE State Scorecard*, and all have policy and regulation encouraging or requiring gas-electric integration and cooperation (Downs et al. 2013). We do not measure the extent to which combined programs are the cause of top energy savings performance or, alternatively, whether leading states aiming for all cost-effective energy efficiency commit to the expansion of their dual-fuel efficiency programs here. They tend to arise together. Below are examples that illustrate supportive state legislation and regulatory directives.

Vermont

Vermont's utility energy efficiency landscape has unique characteristics that set it apart from other states. First, the state policy that created and that supports the energy efficiency utility, Efficiency Vermont has led to nation-leading incremental annual electricity savings above 2% of sales. Second, Vermont has a cold climate and long heating season but lacks natural gas mains and natural gas service throughout the state. It uses a variety of other heating fuels including natural gas, fuel oil, propane, wood, and electricity. Therefore the state statute governing heating and process fuel efficiency programs is significant with respect to the degree of "fuel-blindness" it supports.

Specifically, the law requires program providers who offer fuel efficiency services to do the following:

- 1) Produce whole building and process heat efficiency, regardless of the fuel type used;
- 2) Facilitate appropriate fuel switching; and
- 3) Promote coordination, to the fullest practical extent, with the electric efficiency programs established and administered pursuant to this chapter, as well as with low-income weatherization programs and any utility energy efficiency programs.
(VSA 2008)

The law goes on to direct the Public Service Department Vermont (a state agency), subject to the oversight of the Public Service Board, (a quasi-judicial regulatory board), to

ensure that all retail consumers, regardless of retail electricity, gas, or heating or process fuel provider, will have an opportunity to participate in and benefit from a comprehensive set of cost-effective energy efficiency programs and initiatives designed to overcome barriers to participation.
(VSA 2008)

The programs for heating oil, wood, and propane are provided through Efficiency Vermont. They pay direct incentives for home retrofit thermal efficiency measures. Costs related to those fuels are paid for through revenues from bidding energy efficiency into the New England Forward Capacity Market (FCM) and from Regional Greenhouse Gas Initiative (RGGI) auction proceeds.

Connecticut

Connecticut's legislation regarding the integration of gas and electric energy efficiency is comprehensive across all fuels and utilities and statewide. The electric utilities in coordination with the gas companies must submit to the Connecticut Energy Conservation Management Board (now called the Energy Efficiency Board) a combined electric and gas Conservation and Load Management Plan "to implement cost-effective energy conservation programs and market transformation initiatives. All supply and conservation and load management options shall be evaluated and selected within an integrated supply and demand planning framework." (CGS 2013)

Public Act 11-80 (2011), Section 51 establishes the requirement for the Department of Energy and Environmental Protection (DEEP), in consultation with the Connecticut Energy Efficiency Board (CEEB), to file a Comprehensive Energy Plan (CGS 2013). In its review of the 2012 Electric and Natural Gas Conservation and Load Management Plan, the CEEB, commented that "integrated programs across the electric and natural gas companies provide opportunities for cross-promotion to shared customers, are more convenient for customers, reduce costly duplication of effort, and enhance the quality of the energy efficiency services provided. A single, integrated electric and gas 2012 Plan supports and enhances the integrated programs" (CEEB 2011).

Connecticut efficiency programs also address fuel oil efficiency. Fuel oil is a major source of home heating throughout several of the northeastern states. The Home Energy Solutions program, for example, is funded by a 3 mil systems-benefit charge on customer bills that goes into the Connecticut Energy Efficiency Fund. The program reported net savings of over 1.7 million gallons of fuel oil.

California

A number of state utility regulatory commissions have addressed the conventional practice of regulating utilities as entities in individual "silos" and have sought to encourage coordinated electric and gas energy efficiency programs. The CPUC directs the utilities to work together in various ways. For example, the CPUC devotes a whole section of its approval of Southern California Edison Company's (SCE) 2010-2012 energy efficiency portfolios and budgets to the topic. Under Local Government Partnerships, the decision states, "In the case of SCE and SoCalGas, where service territories overlap, we anticipate both customers and energy management contractors would welcome the coordination of energy improvements loans into a single package for gas and electric measures. SCE and SoCalGas should endeavor to arrange combined loans when possible" (CPUC 2009, 289).

Massachusetts

In 2008, the governor of Massachusetts signed Chapter 169 of the Acts of 2008, An Act Relative to Green Communities (the Green Communities Act). The new law altered the approval process and timeline for electric and natural gas utility energy efficiency plans and required the utilities to file the plans every three years. The law required the state's regulatory authority, the Department of Public Utilities, to ensure that energy efficiency programs "are delivered in a cost-effective manner capturing all available efficiency opportunities, minimizing administrative costs to the fullest extent practicable, and utilizing competitive procurement processes to the fullest extent practicable (MAL 2008)." In addition, the law directed the Department of Public Utilities (DPU) to appoint and convene an Energy Efficiency Advisory Council (EEAC), whose members play a key role in designing, approving, and monitoring the energy efficiency programs of Massachusetts' investor-owned utilities. The Green Communities Act directs the council as follows:

as part of its review of plans, examine opportunities to offer joint programs providing similar efficiency measures that save more than 1 fuel resource or to coordinate programs targeted at saving more than one fuel resource. Any costs for joint programs shall be allocated equitably among the efficiency programs. (MAL 2008)

Five of the Mass Save programs serving residential customers provide rebates for furnace and boiler replacements for oil and propane. Generally the incentive levels increase with the Annual Fuel Utilization Efficiency (AFUE) rating of the equipment.

Illinois

Another state where strong policy support appears to be critically important is Illinois. As one expert asserted, "There are no joint programs in Illinois . . . that were voluntarily established by electric or gas utilities" (Neumann 2013).

While exceptions to that rule can undoubtedly be found, Illinois is indeed an example of a state in which specific policy support for integrated electric and gas energy efficiency programs has been a key factor. In Illinois, which is a leader in coordinated programs between single-fuel utilities, the Public Utilities Act (PUA) explicitly requires coordination:

In submitting proposed energy efficiency plans and funding levels to meet the savings goals adopted by this Act the utility shall:

(6) Demonstrate that a gas utility affiliated with an electric utility that is required to comply with Section 8-103 of this Act has integrated gas and electric efficiency measures into a single program that reduces program or participant costs and appropriately allocates costs to gas and electric ratepayers. The Department shall integrate all gas and electric programs it delivers in any such utilities' service territories, unless the Department can show that integration is not feasible or appropriate. (ILGA 2014)

In the PUA, the Illinois Commerce Commission (ICC) is directed to “develop and solicit public comment on a plan to foster statewide coordination and consistency between statutorily mandated natural gas and electric energy efficiency (‘EE’) programs to reduce program or participant costs or to improve program performance.”³ (ICC 2012)

Rhode Island

Rhode Island is yet another leading state with legislation supporting integrated and coordinated energy efficiency programs. The *Comprehensive Energy Conservation, Efficiency and Affordability Act of 2006* of Rhode Island requires utilities to acquire all cost-effective energy efficiency. This act demonstrates the legislature’s support for combined gas and electric programs in its statement that:

The commission may provide for the coordinated and/or integrated administration of electric and gas demand side management programs in order to enhance the effectiveness of the programs. Such coordinated and/or integrated administration may after March 1, 2009, upon the recommendation of the office of energy resources, be through one or more third-party entities designated by the commission pursuant to a competitive selection process. (39-2-1.2) (RIPUC 2006)

Maine

Efficiency Maine Trust is guided by certain priorities that are reflected in the choices made in its Triennial Plan regarding budget allocation and program design. One of these primary priorities is comprehensiveness:

It is a priority of the Triennial Plan, over time, to promote more comprehensive solutions to Maine’s energy consumer issues. In part, this is being advanced through program designs such as the Residential Low Income program and the [property assessed clean energy] PACE Loan program where measures that save electric energy are being integrated with measures to save thermal energy. Integrating the delivery of electric and thermal saving measures promotes a kind of “one-stop shopping” that encourages looking at the home as an interactive system and implementing upgrades that save more energy at lower cost. Pursuing comprehensive solutions also means capturing “deeper” savings by encouraging customers to take advantage of the opportunity to make multiple upgrades while the work crews are already on-site and new equipment and systems are being installed, reducing transaction costs. While investment in deeper savings measures will drive up the total cost of a given project, it is a more affordable way to capture energy savings than harvesting only the “low hanging fruit” one year and postponing the

³ The ICC reports to the Illinois General Assembly on coordinated gas and electric programs. The *Report to the General Assembly Concerning Coordination Between Gas and Electric Utility Energy Efficiency Programs and Spending Limits for Gas Utility Energy Efficiency Programs* is available at <https://www.icc.illinois.gov/reports/report.aspx?rt=35>.

harvest of more expensive, albeit still cost-effective energy savings for another day (EMT 2012).

Within this structure of integrated delivery of energy saving measures, Efficiency Maine provides incentives for residential high-efficiency space heating equipment replacement. This includes oil and propane furnaces and boiler replacement, as well as air-source heat pumps.

Another example of regulator support is the New York State Public Service Commission, which has indicated its support for the benefits of offering “integrated gas/electric whole-customer programs” in its order establishing an energy efficiency portfolio standard and approving programs (NYS PSC 2008).

EFFECTIVE INSTITUTIONAL RELATIONSHIPS

There are a variety of institutional structures for and utility/program administrator approaches to providing combined natural gas and electric energy efficiency programs. In this report, we look at four general categories of effective institutional relationships: combination utility, integrated statewide programs, third-party administrator, and coordinated programs between two separate (usually single-fuel) utilities.

Combination Utility

In combination utility programs, one utility serving gas and electric customers provides an energy efficiency program that offers both gas and electric measures. Such programs have many advantages including the simplest administrative structure. They have fewer regulatory issues and simpler management and vendor relationships, and they avoid competition over customers, marketing, load, and branding.

National Grid Large Commercial Retrofit in Rhode Island possesses many of the beneficial attributes of a combination utility running a dual-fuel program. National Grid is effectively the only utility in the state.⁴ Some vendors have shirts and jackets with National Grid’s logo on them. Some have National Grid or co-branded business cards. In the regulatory sphere, there is only one joint filing and one docket. The same salespeople are involved in both gas and electric efficiency projects. Most technical support personnel are similarly dual fuel. See the National Grid Large Commercial Retrofit profile in Appendix A for details.

Another large investor-owned combination utility, NSTAR, in Massachusetts, faces a different set of circumstances. The majority of NSTAR Electric’s and NSTAR Gas’s territories are single fuel, which means the company owns both an electric utility and a natural gas utility. Yet in a given community, NSTAR usually provides only electricity or natural gas, not both. NSTAR also coordinates with other utilities within the Mass Save

⁴ The exception is that several small towns have municipal utilities.

framework to deliver energy-blind programs to customers. For statewide C&I programs, NSTAR approaches potential energy efficiency program participants by size and by market segment, not fuel type. For small business, the energy assessments are led by the electric utility, but they cover electric, gas, and oil measures. If the customer takes any of the recommended gas measures, then the gas PA provides the incentive and claims the energy savings. For large C&I customers, energy engineering studies are fuel blind and provide electric, gas, and oil saving recommendations. As in the rest of Massachusetts, the electric or gas utilities will reach out to engage a customer separately, but they may co-fund engineering studies. Once a project is implemented, the gas and electric companies fund and claim savings based on the measures with the respective fuels.

Statewide Integrated

Another successful strategy for integrating gas and electric programs is to maintain separate utility program administrators and combine and/or standardize the program operations, branding, and implementation on a statewide basis. This approach brings advantages of scale beyond what would be possible with only a subset of utilities collaborating, as well as consistency and uniformity in multiple areas. Incentive levels, forms and processing, marketing and branding, and other aspects become standardized. Consistency makes the programs simpler for customers, contractors, and suppliers and avoids confusion and complication. Success requires a high degree of give-and-take among the utilities and other program administrators, as well as frequent communication and multiparty meetings to hammer out agreements on a regular and ongoing basis.

Massachusetts Mass Save commercial programs and Connecticut Home Energy Solutions with Home Performance exemplify this approach. With the Mass Save approach,

[as] savings goals increased, it became clear that a collaborative approach was needed not only with the individual gas and electric programs, but across the state, among all PAs, and between both the gas and electric programs. This was crucial to maximize the savings with each customer, capture economies of scale, minimize customer confusion, and meet the goals of the Green Communities Act. It was incumbent on everyone in the energy-efficiency industry in Massachusetts to move forward with one common message and one call to action, regardless of utility provider. This was the driving force behind the creation of Mass Save. (Halfpenny et al. 2012)

The choice of a statewide integrated model by Connecticut also evolved in the context of achieving high savings goals – including “all cost effective efficiency” – and other state policy objectives. By law, all the electric and gas companies must submit a three-year plan under the comprehensive Conservation and Load Management Plan. Northeast Utilities (NU) owns and operates Connecticut Light & Power and Yankee Gas, and UIL Holdings (UIL) owns and operates the United Illuminating Company, Connecticut Natural Gas, and Southern Connecticut Gas. Connecticut also uses an integrated resource planning process.

The Connecticut program profiled in this report, Home Energy Solutions, is administered jointly and uniformly, staffed by NU and the UIL employees. However, each holding company uses its own system for tracking and reporting on its gas and electric companies.

Several investor-owned and municipal utilities in California offer consistent programs. These include Energy Watch partnerships among utilities and municipalities and Savings by Design Commercial New Construction, which is a statewide *program*, not just a statewide brand. These are funded by California utility ratepayers under the auspices of the CPUC.⁵

Third-Party Statewide Administrator

Several states have established their utility sector energy efficiency programs predominantly or substantially through a statewide administrator or public benefits organization. In these cases, ratepayer funds are pooled into a central entity and then allocated throughout a portfolio strategically to meet cost-effectiveness and other policy goals. The administrator runs the programs on behalf of the gas and electric utilities. This strategy lessens or avoids altogether some of the challenges that single-fuel utilities would have had to face in coordinating their efforts, such as inter-utility competition, savings and cost allocation issues, and regulatory differences in budgeting and plan timelines. New York State (NYSERDA), New Jersey (NJ Clean Energy Program), Oregon (Energy Trust of Oregon), Wisconsin (Focus on Energy), Maine (Efficiency Maine), Delaware (Energize Delaware), and Washington, DC (DC Sustainable Energy Utility) are examples.

Some of the largest dual-fuel energy efficiency programs with the greatest sustained energy savings impacts are administered this way. These include the Energy Trust of Oregon's Production Efficiency, Focus on Energy's Large Energy Users Program, and the NYSERDA Multifamily Performance. (See Appendix A for profiles of these programs)

Coordinated Programs

As we define them here, coordinated programs are those in which two single-fuel utilities collaborate to provide both gas and electric efficiency measures to customers, while not necessarily fully merging all aspects of the program itself. As more states ramp up their EERS savings targets, and as they have added natural gas savings requirements to electric, more single-fuel utilities have been coordinating with a partner utility to acquire more savings and achieve cost efficiencies.

Compared to some of the other administrative models, this two-utility approach has additional coordination challenges. Nevertheless, there are many successful examples in

⁵ The California programs profiled in Appendix A of this report are presented as examples of coordinated programs; these two partnerships are not statewide integrated programs. California Advanced Homes is also offered by other investor-owned utilities in different parts of the state.

place. Because this is an area where there is a lot of opportunity within the industry, we devote more time to highlighting these examples.

The examples of successful coordinated programs between utility partners that we examined in our research are summarized in table 2.

Table 2. Coordinated utility programs

Program	Category	Utility 1	Utility 2
Smart Ideas For Your Business Retro-Commissioning and Monitoring-Based Commissioning	Commercial retro-commissioning	ComEd	Nicor Gas, Peoples Gas, and North Shore Gas
Small Business Direct Install	Small business direct install	LADWP	SoCalGas
Home Energy Squad	Single family direct install	CenterPoint Energy	Xcel
California Advanced Homes	Residential new construction	SoCalGas	LADWP
Residential New Construction Service	Residential new construction	Efficiency Vermont	Vermont Gas Systems
EfficiencyCrafted New Homes	Residential new construction	Columbia Gas of Ohio	AEP Ohio
Home Energy Savings	Home energy retrofit	Nicor Gas, Peoples Gas, and North Shore Gas	ComEd

We summarize some of the distinguishing features of these coordinated programs below. Full profiles of the programs are included in Appendix A.

Home Energy Savings. Utilities are the program administrators, with a program manager at each utility. The administrators hire one implementation contractor company that employs energy advisors who conduct energy assessments and acts as general contractor for the weatherization projects. Both utilities manage the implementer directly. There are biweekly operations and marketing calls among all three.

Smart Ideas for Your Business Retro-Commissioning and Monitoring-Based Commissioning. Since 2012, when gas utilities began collecting funds on customer bills for efficiency, ComEd has worked with the utilities to seek gas as well as electric savings on retro-commissioning projects. ComEd's program was already in its fourth year, with an established program implementer and service providers (trade allies such as electricians and weatherization

firms). This infrastructure was expanded to include gas: ComEd paid the up-front costs of investigating for gas savings, and the gas utilities would reimburse ComEd at the end of the program year for verified savings.

Small Business Direct Install. LADWP is the lead utility. Built on a previous small-business lighting program that had served over 44,000 businesses, this new addition to the successful partnership between LADWP and SoCalGas is beginning by serving very small businesses with monthly demand below 30 kW. Ultimately, it will include water, gas, and electricity saving measures to help small businesses reduce their utility bills as an economic stimulus and source of job creation. The program combines two funding streams: gas ratepayer funding under the auspices of the CPUC, and electric ratepayer funding under the authority of the city of Los Angeles and the auspices of the CEC.

Three coordinated residential new construction programs illustrate successful variations on the model.

EfficiencyCrafted New Homes. When AEP Ohio and Columbia Gas of Ohio jointly launched the residential new construction program in 2010, it was without a policy or regulatory mandate. The motivation was and is to increase savings and cut expenses through a coordinated program by addressing market barriers such as first cost and lack of information on the part of home builders. Each company contracts separately with the common implementation contractor. The key program strategy employed is an extensive support package for builders, including incentives, training, quality assurance, consumer marketing materials, recognition, PR, and media events. Incentives and marketing messages are linked to two tiers of energy ratings, ENERGY STAR versions 2 and 3. Incentives paid to builders are determined by each utility; each claims the savings for their measures' fuel when they provided the incentive. The program has grown rapidly, with spending tripling from 2.1 million in 2011 to 6.3 million in 2013.

California Advanced Homes (CAHP). An existing program that the investor-owned utilities (IOUs), including SoCalGas, have offered statewide since the 1990s, CAHP has been modified in this case to add a municipal utility, LADWP, as a partner with an IOU. Previously SoCalGas paid electric incentives to participating builders, but that practice was discontinued by the CPUC. LADWP now pays the electric incentives, all for savings beyond California Title-24 building code. SoCalGas is the lead utility and manages all operations, consulting with LADWP as its partner and reporting monthly. With this program, LADWP did not need to develop a residential new construction program alone. Instead, it leveraged an existing brand, already well known statewide, without hiring a single new staff person.

Residential New Construction (RNC) Service. This cosponsored new-construction service has been in existence since 2001; Vermont Gas has had an RNC service since 1993. The core of the service today is Vermont ENERGY STAR Homes, which goes beyond national ENERGY STAR Homes criteria to require higher levels of insulation and air sealing in addition to ENERGY STAR lights, appliances, and HVAC equipment. Efficiency Vermont's RNC goals are based on electricity savings; Vermont Gas Systems focuses on natural gas savings. Program cost effectiveness is assessed through the Total Resource Cost test method, which

includes fossil fuel, water, and operations and maintenance (O&M) savings. One distinguishing characteristic of the service is how the utilities have coordinated funding, incentives, operations, and services in different geographic service territories. Projects in Vermont Gas territory represent approximately one-third of the statewide total; outside VGS territory, Efficiency Vermont obtains leads elsewhere. See the profile in Appendix A for a full comparison.

Additional Specialty Areas of Electric and Gas Utility Coordination

Fuel switching and combined heat and power (CHP) programs are closely related to combined gas and electric programs and have important roles to play in energy efficiency program portfolios. These programs may or may not directly involve gas, electric, and combination utilities, yet they both have an impact on all utilities by virtue of decreasing or increasing electric load and natural gas volume.

FUEL SWITCHING

Fuel switching programs may either encourage gas-to-electric equipment replacement or electric-to-gas, depending on the end use and the relative costs and opportunities available. Our investigation set out to describe some approaches to managing these opportunities in ways that benefit customers and integrate with state energy policy strategies while not disadvantaging one utility or class of utilities over another.

Sometimes fuel switching programs are called fuel substitution, fuel efficiency, or fuel conversion programs. In this paper we refer to fuel switching at the customer level, and view this in the context of “converting customers from one fuel to another when the costs of converting are less than the costs to society of not converting” (Nadel et al. 1994).⁶ The most common fuel switching programs included in energy efficiency portfolios today provide incentives for customers to replace electric space- and water-heating equipment with natural gas, and these are our primary focus here.⁷ “Electric-to-gas substitution or switching refers to the decision of small, generally residential consumers to use natural gas rather than electricity for certain end-use applications,” according to the National Regulatory Research Institute (Costello 2009). Because natural gas appliances generally have an advantage over electric appliances in terms of full fuel-cycle efficiency (due to the amount of energy required to produce and deliver electricity), substituting a gas appliance for an electric

⁶ To be clear, the phrase “fuel switching” is also used within different contexts or definitions as well, such as converting coal-fired power plants to natural gas-fired power plants (Young 2012), substituting natural gas for coal, or making other adjustments to the primary energy inputs in industrial process heat applications (RMI 2014).

⁷ The conventional wisdom about life-cycle efficiency tending to favor the switch to gas is shifting in some areas of the country with the promulgation of super-efficient, cold-climate ductless mini-split heat pumps in the marketplace (Neme 2014).

appliance will generally lead to an increase in natural gas consumption at the end-use site, but a decline in total energy consumption for the full fuel cycle (IHS CERA 2014).

As many as 14 states have had fuel switching programs (Harder 2010).⁸ In this section we will only discuss a few noteworthy examples.

In Texas, the Energy Efficiency Goal (§25.181) specifically states that standard-offer and self-delivered programs

shall be neutral with respect to specific technologies, equipment, or fuels. Energy efficiency projects may lead to switching from electricity to another energy source, provided that the energy efficiency project results in overall lower energy costs, lower energy consumption, and the installation of high-efficiency equipment. Utilities may not pay incentives for a customer to switch from gas appliances to electric appliances except in connection with the installation of high efficiency combined heating and air conditioning systems (TXEE 2013).

A recent development that warrants special mention is that the state of Connecticut, through the integrated gas and electric energy efficiency programs, began a pilot project to incentivize both natural gas conversions, primarily from fuel oil, and energy efficiency measures in 2013. Both program elements are being coordinated in targeted communities as part of the state Comprehensive Energy Strategy (CES). This is significant from a policy perspective for many reasons, one of which is that the CES includes the goal of converting 80% of state to natural gas by 2030.

It is noteworthy that the state statute concerning the implementation of the CES requires state agencies – including the Clean Energy Finance and Investment Authority (CEFIA), DEEP, and the Energy Conservation and Management Board (ECMB) – to set up the pilot to include incentives to install efficient equipment and improve the efficiency of building envelopes, in addition to fuel conversion. (Borrelli 2013). The gas and electric utilities jointly promote the initiative to residential customers on the gas main or within the gas main extension to areas previously only served by deliverable fuels. Important features of the program are that it *also* provides similar incentives for those who cannot cost effectively convert to gas, *and* provides access to low-cost financing to both customer groups.

Value of Fuel Switching Programs to Each Type of Utility

In short, the electric utility gets the savings, the gas utility gets the sales, and the customer should get end-use cost savings. More precisely, the advantage of fuel switching in the context of energy efficiency programs for the electric utility is the acquisition of, and credit for, the kilowatt-hour electric energy savings. Depending on the regulatory and other

⁸ Harder includes Colorado, Florida, Idaho, Indiana, Massachusetts, New Jersey, New York, Oklahoma, Oregon, Pennsylvania, Texas, Vermont, Washington, and Wisconsin.

circumstances, in general, the advantages to a single-fuel natural gas utility include increased gas sales (throughput) and enhanced customer service through reducing barriers to fuel choice. The gas company may get these benefits from the presence of a fuel-switching program in its territory, whether it is engaged in funding or administering the program directly or not.⁹

For detailed examples of fuel switching programs, including how energy savings are quantified, see the Texas and Oklahoma CenterPoint Energy program profiles in Appendix A.

Avista Utilities mentions that another benefit to switching to gas is gas's potential for favorably impacting the company's relationship with trade allies. Avista, a combination utility company in Washington and Idaho, states in its 2013 business plan that its inclusion of enhanced incentives for "fuel efficiency" programs (conversions to natural gas) was one means of continuing a strong natural-gas trade ally relationship for the benefit of Avista's customers (Avista 2012b).

Fuel Switching as Electric Energy Efficiency Program

In states that count the entire (electric) energy use of the equipment replaced with gas as energy savings, electric-to-gas substitution can be a highly cost-effective energy efficiency program, from the perspective of the electric utility. However, it is incumbent upon state policymakers and regulators to ensure that the full societal cost effectiveness be considered – with all the costs and all the benefits – including both the reduced electric load and the increased natural gas consumption.

The Avista Utilities Electric to Natural Gas Conversion Program mentioned above is one example of fuel switching as an electricity savings program. The 2012 Total Resource Cost (TRC) test is 3.42 for water heaters and 4.29 for natural gas space-heating conversion, which is a much higher BC ratio than the overall Avista DSM portfolio TRC of 1.58 for that year as published in its annual report (Avista 2012a). In Washington and Idaho, the program provides a "fuel efficiency" rebate to eligible residential electric customers who have natural gas available and who currently heat their homes and water with Avista electric. The base prescriptive rebates for switching are \$900 for home furnaces and \$300 for water heaters. In Washington State, there are additional financial incentives for installing high-efficiency equipment: a \$250 furnace rebate for a unit with 90% AFUE or greater; a \$20 water heater rebate for a 50-gallon tank type of 0.60 energy factor (EF) or greater or a 40-gallon tank type of 0.62 EF or greater; and a \$130 tankless water heater rebate for equipment with 0.82 EF or greater.

⁹ See Costello (2009) for a discussion of fuel switching from consumer, regulator, environmental, and utility cost-recovery perspectives.

Fuel Switching as a Natural Gas Energy Efficiency Program

In Oklahoma, CenterPoint Energy offers a novel approach to fuel switching that illustrates many of the issues involved in dual-fuel energy efficiency programs. CenterPoint is a combined utility company with both gas and electric operating companies in multiple states. In Oklahoma, the CenterPoint gas utility offers rebates to customers to install high-efficiency natural gas space heating and water heating equipment in place of electric equipment. There is no CenterPoint electric utility in the state of Oklahoma.

What is distinctive is that savings are measured from a total efficiency standpoint, considering the “full fuel cycle” (FFC). FFC looks at energy used from the point of extraction all the way to the appliance. Much of the primary energy ultimately used in an electric appliance is lost in the conversion process. The gas utility may claim the energy savings taking this into account, the delta between the load of the gas equipment and the total energy input for a comparable electric unit. This is an example of one approach that a state might use to judge the societal benefits of a fuel conversion program, although different states may have different resource considerations that could affect their assessment of costs and benefits.¹⁰

When the program began in 2010, there was some opposition in the original docket by electric utilities concerned about losing load to gas. A joint stipulation was arrived at to which these utilities were not opposed. The electric utilities are not involved with fuel switching programs in Oklahoma; they get no electric kWh savings credit. CenterPoint counts the FFC savings toward their Oklahoma energy savings goal, but not toward earning utility financial incentives.

Replacing standard efficiency equipment with high efficiency would count toward an incentive that the utility could earn.

COMBINED HEAT AND POWER

CHP is a special area of natural gas and electric utility coordination. CHP systems simultaneously generate electric and thermal energy, squeezing more useful energy from their fuel input. The combined thermal and electric efficiency of CHP usually exceeds 70%, whereas the separate generation of electricity in the U.S. centralized grid system averages about 34% (Chittum 2013). By generating much more useful energy from a single fuel input, CHP offers the potential for economic and environmental benefits to individual system owners, the local grid, and society as a whole.

¹⁰ Note also that with advances in certain electric end-use technology (e.g., advanced heat-pump water heaters with an EF of 2.2 or higher), some might make a case for electric measures using an FFC approach.

Programs that promote the use of CHP are not combined electric and gas end-use programs in the same vein as the others within this report. However, because CHP is closely related to combined programs as well as strategically important, we wanted to at least touch on this subject. Our objective here is only to briefly describe CHP, address how CHP programs relate to combined gas and electric programs, and show how they help meet state energy policy goals. ACEEE has published several white papers and reports on CHP, including the value proposition for electric and gas utilities.¹¹

CHP programs are targeted toward large commercial, industrial, and institutional customers with high and consistent thermal loads for space or process heating applications. Program administrators may be a statewide third-party implementer, an electric utility, or dual-fuel utility.¹² A primary benefit of CHP as an electric energy efficiency measure is its capacity as a distributed generation resource to deliver large electric savings by reducing the demand for centrally generated grid electricity.

For example, the opportunity for large electric savings was a primary motivation for inclusion of CHP within the Empower Maryland portfolio. In 2012, the Maryland statewide goal of achieving 15% electric savings by 2015 was viewed as having a savings gap. The commission sought ways to get more savings and decided to allow CHP electric savings to count toward the overall statewide 2015 goal. Baltimore Gas & Electric met with electric utilities in Maryland to develop CHP program plans, which have since been approved by the commission. Currently there are dozens of CHP projects in the pipeline in Maryland, with several scheduled to be online at the end of 2014 and in 2015 (William Wolf, manager, I&C Energy Efficiency Programs, Baltimore Gas and Electric, pers. comm., March 13, 2014). Key issues for states in this type of program are ensuring proper measurement and accounting of net electric and gas utility system costs and benefits.

For a gas utility, the primary benefits of new CHP projects in their territory are the increased retail sales and the consistency of having that customer for the long term. However this throughput incentive may not be an important factor for decoupled gas utilities.

In addition to electricity savings and the efficient use of primary energy resources, another public policy benefit of new CHP is the reduction in greenhouse gas emissions. In Massachusetts, the Green Communities Act requires both energy efficiency and an “alternative energy portfolio standard,” for which CHP qualifies. For details and a complete example, see the Massachusetts Combined Heat and Power Program Initiative profile in Appendix A.

¹¹ For more information, please see *Utilities and the CHP Value Proposition* (Chittum and Farley 2013a), *How Natural Gas Utilities Can Find Value in CHP* (Chittum and Farley 2013b), and *How Electric Utilities Can Find Value in CHP* (Chittum 2013). See also *Frontiers of Energy Efficiency: Next Generation Programs Reach for High Energy Savings* (York et al. 2013).

¹² There are a few instances of gas utility CHP program administrators.

Lessons Learned and Recommendations for Success

LESSONS LEARNED FROM PROFILED PROGRAMS

Programs in each of the institutional arrangements discussed in this study have benefited from the application of best-practice program design principles. Representatives of our profiled coordinated and statewide integrated dual-fuel programs shared lessons on meeting the challenges posed by cooperation with competitors, clearing administrative hurdles, and others. Combination utilities and third-party administrators attributed the success of their gas-electric programs to program design and generally applicable approaches. They do not have to deal with as many of the structural issues as the single-fuel utilities, for example, business competition and administrative complexity. Lessons learned for each of the administrative structures are summarized below. The program profiles in Appendix A provide additional insights.

Combination Utilities

A carefully structured, unified internal operation is an effective model for combined gas and electric energy efficiency programs at dual-fuel utilities. As described in the program profile in Appendix A, the National Grid Rhode Island Large Commercial Retrofit is a good example of this efficient approach:

In terms of program infrastructure there are many groups that contribute to the program's overall success. Commercial sales, . . . vendors, marketing, strategy, and program management all play critical roles in raising customer awareness, closing jobs, creating new product offerings, and interacting with stakeholders. . . . resources can be dispatched in many ways depending on the priorities of the program or the company. Sales personnel are responsible for both gas and electric efficiency projects. Most technical support personnel are similarly dual-fuel.

The following specific lessons learned from this structure may also be useful for other combined gas and electric programs:

- To the customer, it is one program. There may have to be dual component tracking systems and two regulatory charges, but all customer-facing marketing, engineering studies, and program material should be unified and integrated so that the customer sees it as one holistic approach to energy efficiency.
- A streamlined application process facilitates customer participation, as do integrated customer-facing material and processes.
- Customers are more responsive when the program makes integrated energy efficiency recommendations. They do not want to receive electric recommendations in one batch and gas later, or some recommendations this year and others next year. A comprehensive set of recommendations enables customers to integrate the projects into their own construction and maintenance schedules.
- Zero-interest financing with on-bill repayment for a customer's portion of a project can be a powerful motivator for customers who previously might have been hesitant

to complete a project. This approach can be particularly effective in programs that formerly featured direct-install, low-cost, or no-cost electric savings measures without avenues to facilitate customers moving forward with capital-intensive gas measures. Zero-interest repayment might spur additional and larger gas projects.

Statewide Integrated

Communication and cooperation are key to the success of statewide gas and electric program integration. Building and maintaining consensus depend on a healthy dose of cooperative spirit and frequent communication among program administrators from each participating utility, often in joint committees or boards. Other important features of these programs include uniformity, simplicity, and program alignment by design. Specific recommendations gleaned from practitioners' experience include the following:

- Agree on consistent terminology.
- Provide a uniform face to the vendors.
- Provide one-stop shopping. It is critical. Customers do not want to have to set up multiple visits.
- Align the dollar amounts and timing of budgets during program design so that both gas and electric savings may be acquired without one fuel running out of funding before the other.
- Handle electric and gas coordination out of view of the customers. Customers should see a seamlessly integrated program while the utilities take care of coordination and cost allocations behind the scenes. Optimally, the program has an overarching brand name (such as Mass Save), common forms, and a common look and feel to all program documents. Utility branding can still be maintained through the use of logos and tag lines, for example, "Mass Save, brought to you by NSTAR Electric & Gas."
- If possible, use the same contractors to install all measures.
- Negotiate and agree to cost shares for all types of expenditures, including non-incentive line items. One approach is to set these based on the respective benefits that the measure provides to each utility.

Third-Party Administrator

Third-party administrators, including statewide public-benefits organizations, have strategic and structural advantages of independence and scale that enable them to achieve higher savings and lower costs through gas-electric programs.

With primary funding coming from customer gas and electric bills via statewide systems benefit charges or similar mechanisms, administrators can often establish efficiency budgets and allocations to particular gas, electric, or dual-fuel programs with a greater degree of coordination. That is, whereas individual, single-fuel utilities must independently propose their efficiency spending and implementation plans through separate regulatory proceedings, third-party administrators typically have more flexibility to direct funds proactively to where they will have the greatest impact. With entire portfolios of gas and electric programs at their disposal, administrators can draw on a trove of resources and

resulting economies of scale that are not attainable by any but a handful of the largest utilities in the country.

Related insights from gas and electric third-party administrators are as follows:

- Dealing with dual-fuel services is natural for large industrial customers, who typically manage their energy use in an integrated way rather than by discrete fuel. It is how they operate. So in the long run dual-fuel programs benefit electric and gas customer relationships.
- Combining multiple energy efficiency program funding sources including gas, electric, and others gives building owners flexibility since they are no longer restricted by prohibitions on what a given funding type may be used for. This removes a barrier to taking on comprehensive projects. Common and consistent offerings across utility service territories also make it easier for customers and trade allies to understand and participate in the program.
- Advanced energy-saving manufacturing technology deployed via strategic energy management (SEM) makes new cost-effective efficiency opportunities available to industrial customers. Demonstrating these opportunities to the customer solves a threshold problem to participation, as many of them believe they have already attained all possible cost-effective efficiency.
- SEM is a transformational opportunity for industrial efficiency programs. Third-party administrators with the capacity and resources for large capital projects can achieve immediate energy savings. On-site SEM training and support help large energy users manage that energy use.
- Lowering the first cost of projects should be a program priority. Companies typically make investment decisions on simple payback criteria or on simple return-on-investment (ROI) and internal-rate-of-return (IRR) calculations.

Coordinated

While single-fuel utilities face more challenges at the outset, they may have the most to gain by establishing coordinated gas-electric programs. Representatives of coordinated programs reported successful practices in a number of key areas. Practices benefiting utility relationships include the following:

- Clear roles and responsibilities are essential. For example, one company may be responsible for providing the other with information on potential new projects for follow-up. The lead utility's responsibility is to provide the other with monthly participation reports to be used for claiming savings and determining the cost-sharing amount paid for service delivery.
- Maintaining good communication is crucial overall and particularly essential to resolving challenges that may arise during program operations.
- The utilities should always consult each other on any significant changes in program design or incentives.
- Each utility should have a single point of contact to manage and streamline communications between each one's program staff.

- Having one utility lead program management, if possible, enables program decisions to be made faster.
- Maintaining coordination requires continuous work. Left to their own devices, independent organizations will revert to their own organizational norms. The most successful efforts rely on regularly scheduled face-to-face meetings among the program managers of each organization to compare notes, discuss improvements, and work through day-to-day implementation issues.

Customer service is another key area. While one utility may serve as the lead program implementer within a given geographic area, it is important to ensure consistent, aligned service for all customers no matter who is the lead entity. For new construction programs, builders should be able to expect the same customer experience everywhere. This is appealing for builder partners who manage multiple projects across service territories.

Turning to program design, successful practices include the following:

- It is very helpful to discuss and come to up-front agreement on the design process itself. Consensus, meaning unanimity, is the goal; a utility should be able to veto any decision that impacts its own budget. The choice of one program design over another may be decided by a simple majority.
- It is wise to allow sufficient time for joint program design decisions. Decisions relating to cost effectiveness and budget constraints can take longer when two independent utilities are involved. Full understanding and buy-in to all the details are critical.
- Involving engineers from both utilities in team meetings helps to resolve differing opinions on cost effectiveness, the viability of measures, and equipment life.
- Home builders perceive a single set of technical requirements, administrative processes, and quality-assurance monitoring as a significantly lower burden than having to participate in multiple programs.
- A combined utility delivery platform directly benefits customers through the convenience of a single in-home visit, the low price of bulk-sourced materials, and the simplicity of a program that unifies gas and electric energy savings with professional direct installation.
- A trademarked overarching program name and logo, used in tandem with the logos of the partnering utilities, portrays a team of helpful professionals – and de-emphasizes the complexities of two separate utilities in the delivery platform. It provides the simplicity that customers want.

A final key area is incentives. Combining visible support (e.g., promotion and incentives) from two different utilities in a shared territory enhances credibility and presents a more compelling value proposition than the individual incentives in isolation. The trade allies (e.g., contractors and suppliers) who are involved in delivering the program place high value on expeditious incentive processing by the utilities.

REGULATORY ACTIONS TO ADVANCE COMBINED PROGRAMS

We asked some of the nationally distinguished energy efficiency experts we consulted (those in research and consulting) about the possible contributions of regulators to the advancement of gas-electric integration.¹³ These individuals have over 100 years of combined experience in the energy efficiency field, they have worked with gas-electric programs, and they have in-depth knowledge of the program-design and policy issues central to this study.¹⁴ We asked each of them:

Do you have any thoughts on what utility regulators can do to facilitate and encourage gas and electric utility collaboration on coordinated gas-electric energy efficiency programs?

Several respondents recommended that state utility regulators mandate the integration of gas and electric programs together. One said they should “encourage or insist that programs be developed seamlessly to the extent practical.” Another began with, “Number one, require it! That is not a flip answer. Regulators have the power to approve programs or not.” A third said that regulators should order statewide multi-fuel integrated programs, and that they should be “requiring joint programs of separate gas and electric utilities where service territories overlap.”

The main reason the respondents offered for mandating collaboration was that the utilities would not do it unless it was required, since they generally do not work closely together and do not have strong cooperative business relationships. “These guys really don’t know each other” was one comment. Another reason for mandated collaboration was the administrative effort required for up-front negotiation and development of the gas-electric programs between two or more utilities. “Initially, it is going to take a lot of work,” one respondent said.¹⁵

Another area of broad agreement was that the onus be on the utilities to be proactive in planning and coordinating joint or coordinated program proposals. One respondent said that integrated gas and electric programs should be the default, and that regulators “should

¹³ Observations from the other experts we interviewed, primarily program administrators and those employed directly by regulated utilities, are not included in this section in order to maintain the independence of these recommendations.

¹⁴ The experts interviewed for this segment are listed in the Acknowledgments. However, in order to provide anonymity and allow for the most candid observations, no observations or quotations are attributed to individuals by name.

¹⁵ While there may be some resistance to forming energy efficiency partnerships with other single-fuel utilities (or at least institutional inertia), it is important to note that there are examples of combination programs and related partnerships in more than 20 states (AGA 2013). Not all of them are the necessary result of regulatory or policy requirements. The combination of a supportive position by regulators and a commitment to business innovations on the part of utilities can be sufficient.

put the burden on the utilities proposing programs to convince them why some part of a proposed program should be less than seamlessly integrated between gas and electric.” A second expert went further, saying that states should “expect utilities to come to them – regulators – with jointly developed offerings, not only gas-electric but also gas-gas and electric-electric.” A third respondent thought that single-fuel utilities should be required to get together to provide integrated program plans only where the gas and electric service territories overlapped.

The experts shared the following additional thoughts on what utility regulators might do to facilitate joint programs:

- Establish a common regulatory scheme that puts both gas and electric under the same least-cost procurement requirement.
- Fund both gas and electric through a system benefits charge (SBC).
- Have appropriate BC test screening tools for electricity and gas. For those states participating in the RGGI, use a generic cost per ton of carbon dioxide emissions that could be easily transferred between gas and electric. RGGI does not currently apply to gas.
- Make sure utilities are using the right cost-effectiveness test. In some places they may only count electric benefits. Calculations need to be integrated. There should be symmetrical consideration of benefits and costs: if regulators are going to look at all the costs, they also need to look at all the benefits.
- Have a big-picture view of all the energy service needs. Consider jurisdictional issues, renewables, distributed generation, storage, quick-start generation capability, and broad policy objectives regarding climate change and cost.
- Look for synergies available by integrating gas into advanced metering infrastructure (AMI). There may be opportunities with newer programmable thermostats talking with AMI, enabling utilities to provide comprehensive services and behavior beyond AMI.
- Consider the decision-making process for inter-utility program committees or stakeholder groups overseeing programs. Do they require consensus, unanimity, or majority rule? Majority rule works for procedural issues. But, for example, utility representatives should reach consensus before telling a program administrator they have to hire more people. It is worth the time to work out rules for decision making or a group charter at the beginning of the process. Distinguish decisions that directly impact individual utility budgets or regulatory requirements from those that are individual preferences.
- Establish clarity, uniformity, and simplicity. Have some clarity on what the objectives are. They may not remain static from year to year. Set rules of the road for the portfolios.
- Establish statewide financing that addresses both electric and gas.
- Make clear statements as to whether energy savings from fuel-switching program results are to be credited, or optimize for saving energy no matter what the fuel. Disincentivize whichever the opportunistic fuel is at the time from capturing load

when prices are low, and simultaneously create structures and regulate to incentivize energy efficiency.

Conclusion

Combined natural gas and electric energy efficiency programs can deliver additional energy and cost savings that contribute to greater customer service and satisfaction. These benefits have been shown to be achievable on a large scale, through a variety of institutional structures, in residential, business, and institutional customer segments, in multiple states showing leadership in energy efficiency policy. As utilities and other program administrators reach for higher levels of cost-effective energy savings, greater program integration and inter-utility cooperation represent a significant opportunity.

The barriers to further development of combined programs are admittedly numerous. In the main, they are institutional and organizational. They are not issues that are solved once and stay solved. Participating gas and electric utility program managers must continuously engage and cooperate to insure that new patterns of inter-utility cooperation become the norm.

Barriers vary by state because of differences in laws, markets, regulation, and the relationships of the utilities and program administrators involved. Issues may arise from the attributes and circumstances of the utility, its staff, history, track record, resources, and how they align with those of its partner utility. Gas and electric utilities may be concerned about cross-fuel competition. The administrative efforts required to develop and administer combined programs can be substantial.

Addressing concerns about competition often requires months of negotiation to agree on cost allocation, energy savings accounting, branding and marketing strategies, staffing, vendor and contractor oversight, and other arrangements. Each state has its own regulatory issues and requirements for program planning, timing, reporting, promotional practices, funding sources, and so forth. Questions must be answered regarding cost-effectiveness tests and screening, tracking of costs and attribution of benefits, budgeting, and integration with water and other resources.

Fortunately, experience in a number of states demonstrates that these obstacles are not insurmountable. Appendix A presents an array of successful programs, describes how they are organized and operate, and indicates their performance results. Each profile also characterizes the coordination and integration of the electric and gas utilities (or departments within a single utility), their motivations for coordinating efforts, and lessons learned regarding what has worked and what remains a challenge.

Finally, one of our strongest findings is that the states that lead in energy efficiency program performance results are those with the most robust laws, regulations, and policy structures supporting combined programs. Given a sufficient push from legislation and regulation, program administrators do seize the opportunities, and they are doing so effectively. The energy efficiency industry experts we interviewed supported this conclusion, advocating

expanding regulatory mandates that gas and electric utilities work together to integrate programs.

While creating and operating coordinated natural gas and electric energy efficiency programs can be challenging, the benefits can be substantial. We recommend that states and utilities examine the successful programs we have profiled. States should consider enacting and supporting policies that enable such programs, and utilities should combine and create them.

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Appendix A: Profiles of Combined Gas and Electric Programs

LARGE COMMERCIAL RETROFIT, NATIONAL GRID RHODE ISLAND

Program at a Glance

Program name	Large Commercial Retrofit
Targeted customer segment	Large commercial
Program start date	1988 electric/2007 gas
Annual energy savings achieved (2013)	Electricity: 42,199 MWh (preliminary) Gas: 128,022 MMBtu (preliminary)
Number of program participants	1,831 total recorded, gas and electric (might be overlap)
Peak demand (summer) savings achieved	5,514 kW
Spending for most recent year (2013)	\$15,909,000
Funding sources	Gas: energy efficiency program charge on customer bills, weatherization charge in rates. Electric: energy efficiency program charge on customer bills, regional greenhouse gas auction
Website	https://www1.nationalgridus.com/EnergyEfficiencyPrograms
Contact for information:	
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Program Overview

National Grid's Large Commercial Retrofit Program serves the needs of existing buildings in their pursuit of energy efficiency. This is often done by installing controls to control existing equipment or by replacing components of existing systems, such as lighting. This program contains several initiatives. Some will be discussed below.

The program targets an array of customer sectors such as schools, hospitals, hotels, and data centers, and so on. The company's Commercial Retrofit Program targets measures as simple as pre-rinse spray valves that save gas and water in restaurant environments to large combined heat and power (CHP) projects at universities and manufacturers.

National Grid offers a number of services and incentives to encourage its customers to participate in the Commercial Retrofit Program. They include, but are not limited to:

- a. Financial incentives that encourage customers replace equipment before the end its estimated life.
- b. Technical services that range from an ASHRAE Level I audits to engineering support to replace a key piece of industrial process equipment.
- c. Zero interest financing for select projects that meet National Grid criteria. These funds may be paid back through the customer's bill.

National Grid delivers its services through many paths depending on the vertical market segment the customer falls into and their gas and electric consumption. The largest and most complex customers are served by a team of experienced sales representatives – sometimes with the assistance of nationally recognized planning and engineering firms. Smaller customers are generally served by sales representatives working closely with turnkey vendors called project expeditors, or PEX for short. PEX firms have varying levels of knowledge and experience ranging from lighting upgrades to boiler controls to stream trap repair and replacement. PEXs may cultivate their own projects and bring them to the attention of a National Grid staff member.

National Grid offers up to 50% of total project costs to customers engaging a retrofit project. All projects, gas or electric, must pass a TRC screening test. Gas and electric programs are funded by distinct charges on a customer's bill or bills. Although these funds are frequently both used on a project, electric funds may only be used for electric measures and gas funds may only be used on gas measures. Some funds from each pool are comingled for technical assessment purposes. An example of this would be an energy audit where the exact end uses in a facility are not known. Fuel switching is not eligible. However, if a customer is switching fuels, the program can offer an incentive to go from a standard efficiency piece of equipment in the new fuel to a high-efficiency unit.

Coordination/Integration of Gas and Electric Utility

National Grid uses one brand to market the Large Commercial Retrofit program. The most recent revision includes the National Grid logo featuring the tagline: "Here with you. Here for you." In some cases, the company will choose to co-brand an initiative with a vendor partner. Marketing must approve the use of the brand. It is usually in certain place on the marketing materials or document and must be featured at least as prominently as the symbol of the company with which National Grid is cobranding. Many vendors also have shirts and jackets that feature National Grid's logo as well as their own. Depending on the role they play, some vendors might have National Grid or cobranded business cards.

In terms of program infrastructure, there are many groups that contribute the program's overall success. Commercial sales are typically considered the heart of this structure, but vendors, marketing, strategy, and program management all play critical roles in raising customer awareness, closing jobs, creating new product offerings, and interacting with National Grid stakeholders. Its official structure is that of a matrix organization where

resources can be dispatched in many ways depending on the priorities of the program or the company. Sales personnel are responsible for both gas and electric efficiency projects. Most technical support personnel are similarly dual fuel.

Nearly all employees who support this program interact with vendors in some way. Vendors are paid by sales processing or by the National Grid program management group. Occasionally, they are paid through other paths, but these vendors may have special multidimensional relationships with the company.

In this program, core functions like marketing, customer and market systems, program strategy, and customer intelligence are shared between gas and electric program operations. However, these employees must bill their time to the correct electric or gas area. Duplication of effort can be an issue as National Grid's many subgroups might be attacking the same issue from a different perspective. If this is found to be the case, National Grid integrates the efforts and tries to look at the issue in a comprehensive fashion.

The funding for this program comes from a charge on customers' bills in accordance with Rhode Island law. The amount paid is calculated based on Dth or kWh consumed on a monthly or billing cycle basis. Additional funding may come from Regional Greenhouse Gas Initiative (RGGI) auctions. However, the proceeds from RGGI auctions do not flow directly to National Grid. In Rhode Island, these funds are managed by the Office of Energy Resources (RIOER). These funds are often transferred to National Grid to focus on a specific area such as financing, community centers, nonprofits, or agriculture. The amount and focus may change from year to year. The company also receives money from Forward Capacity Market (FCM) auctions.

The company may claim savings under this program as long as the program has influenced the customer to proceed with energy-efficient projects. Influence may include incentives, technical support, trainings, or financing. Gas savings may only accrue to the gas "company" within National Grid and electric savings may only accrue to the electric "company" within National Grid. Gas and electric savings are reported separately.

National Grid has evaluation teams for all states in which it operates. Evaluations are planned in advance and listed in the yearly plan that National Grid files with its stakeholders. Many evaluations in Rhode Island are run in conjunction with other National Grid jurisdictions as many things such as measures, vendors, and incentive levels are frequently the same across states. Evaluations are paid for from the energy efficiency program budget.

Motivations/Reasons That Led to Gas and Electric Utility Cooperation for This Program

National Grid serves over 99% of the electricity customers in Rhode Island and is the only natural gas distribution company in the state. It is natural and logical for the gas and electric customers to be as integrated as possible since, to many customers, National Grid is the only utility they know.

Regulatory Issues

Gas and electric operations are essentially regulated separately by the RI PUC, so they have separate savings goals, budgets, and SBCs but one National Grid filing and one docket. Customers see it all as coming from National Grid.

Retrofit energy efficiency services for electricity customers have been in place continuously in Rhode Island since 1988. Legislation in 1998 provided a stable source of funding for this program. In 2006, the legislature passed path-breaking legislation to extend energy efficiency into the gas sector, and the first gas efficiency filing was made in 2007 and started July 1 of that year. A joint gas and electric filing has been made since the 2009 program year. While the filing has been joint since then, integration efforts have progressed. For example, it was in 2011 that the retrofit program was first referred to by one common name for gas and electric services in regulatory proceedings. However, there still remain separate energy efficiency program charges for gas and electric programs, though this is not a limitation.

Oversight and approval for the Retrofit Program, along with the rest of the energy efficiency program plan, is as follows. The program design is developed by National Grid with input from a collaborative group of stakeholders. National Grid submits the plan to the Energy Efficiency and Resource Management Council (EERMC), the oversight council established by the 2006 law. The EERMC reviews and votes to endorse the plan or not and also makes a finding of the cost effectiveness of the plan. National Grid files the plan with the RI PUC for approval. Once the plan is approved, the EERMC also provides oversight on program implementation during the program year.

The governing law of least-cost procurement applies to both gas and electric energy efficiency. It does not specifically mention cooperation among utilities because, in assigning program administration responsibility to the distribution company, the legislature was aware that there is just one distribution company. See <http://webserver.rilin.state.ri.us/Statutes/TITLE39/39-1/39-1-27.7.HTM>.

Program performance

	2011	2012	2013
Total spending	\$8,483,400	\$14,819,100	\$15,909,000
Gas spending	\$1,081,300	\$2,587,400	\$2,914,700
Electric spending	\$7,402,100	\$11,231,700	\$12,994,300
Net kWh savings	30,848,000	38,398,000	42,199,000
Net MMBtu savings	31,009	95,485	128,002
TRC gas	1.38	1.06	n/a
TRC electric	4.33	2.22	n/a
CCE gas \$/MMBtu	\$3.58	\$2.78	\$3.67
CCE electric \$/kWh (utility costs only)	\$0.019	\$0.024	\$0.025

Final benefits calculation has not been done for 2013, so benefit-cost ratio cannot be calculated. Benefits include other resource and non-resource savings, though the quantities are not explicitly reported. Gross savings are not readily available. Impact evaluations are posted on EERMC website. Only TRC cost effectiveness is used in Rhode Island

Lessons Learned

One major lesson learned was that, to the customer, it is one program. There have to be two tracking systems and two regulatory charges, but all customer-facing marketing, engineering studies, and program material should be unified and integrated so that the customer learns that it is one holistic approach to energy efficiency. Marketing and sales, which are also customer facing should be similarly aligned. At the same time, this provided an impetus to streamline the application process to facilitate customer participation. National Grid believes it has made great strides integrating customer-facing material and processes.

In a similar vein, customers are more responsive when the program presents integrated recommendations to them for energy efficiency. They do not want to get electric recommendations in one batch and gas later or some recommendations this year and others next year. Presenting a comprehensive set of recommendations to them enables them to integrate the projects into their own construction and maintenance schedules.

National Grid has discovered that zero interest on bill repayment for a customer's portion of an energy efficiency project can be a powerful motivator for customers who might have been hesitant to complete a project in the past. Traditionally, National Grid has only offered this for electric projects where there was more demand and where there were more resources. In the past few years, the gas budget has become more robust due to a higher collection rate per Dth, and there are areas where zero interest repayment might spur more

and larger gas projects. Therefore, the company is in the process of setting up a zero interest gas repayment mechanism.

The company is also investigating what the optimal combination of financing and incentives are for customers. Some customers may prefer more financing and fewer incentives. This could be beneficial in the long term as loaned funds are returned and could be used again without additional burden on ratepayers.

**MULTIFAMILY WATER AND SPACE HEATING MARKET TRANSFORMATION PROGRAM,
CENTERPOINT ENERGY ELECTRIC TEXAS**

Program at a Glance

Program name	Multiple Family Water and Space Heating Market Transformation Program
Targeted customer segment	New construction multifamily
Program start date	2004
Annual energy savings achieved (2013)	1,376,736 kWh
Number of program participants	2013: 1,411 2012: 1,110
Peak demand (summer) savings achieved	581.8 kW
Other measures of program results to date	2004 to 2009 over 7,200 units converted to natural gas
Spending for most recent year (2013)	\$400,000
Funding sources	Electric: Ratepayer-funded energy efficiency program
Website	centerpointefficiency.com
Contact for information:	
	Cheryl Bowman Energy Efficiency Implementation Manager CenterPoint Energy (713) 207-5631 Cheryl.bowman@centerpointenergy.com

Program Overview

The Multiple Family Water and Space Heating Market Transformation Program targets developers of new construction apartment projects within the CenterPoint Energy Houston Electric (CenterPoint Electric) footprint. CenterPoint Electric works with CenterPoint Energy Gas (CenterPoint Gas) to identify potential interested developers.

The program was initially designed to encourage the installation of individually gas-fired water and space heating in a market that typically installs all-electric appliances. Gas boilers were included in recent years in an effort to capture additional projects and construction types. This program is not linked to other energy efficiency programs for lighting, building shell, or air conditioning.

The Multiple Family Water and Space Heating program is offered on an annual basis through a kick-off meeting that outlines the program requirements and incentives levels.

Applications are received, reviewed, and accepted based upon market type (market rate or hard-to-reach projects), installed equipment, and project completed date.

The program offers incentives on a per-unit basis and varies depending upon the type of water heating and type of project. For individual gas water heaters in market rate projects, the incentive is \$250 per unit, for hard to reach it is \$450. For projects that install gas-fired boilers for water heating in market rate and hard-to-reach projects, the incentive is \$150 and \$250, respectively. New for 2014, are incentives for the installation of a combo unit that provides both space and water heating. Incentive levels vary based upon an analysis of the project and will range from \$350 to \$750. The program does not cover increased efficiencies of electric water or space heating. All water heating equipment must meet or exceed applicable federal efficiency standards or local building codes, as applicable. For storage tank water heaters, these standards were revised in 2004. For natural gas storage tank water heaters, the current federal standards are: for a 40 gallon tank an EF of .59 and .58 for 50 gallon.

The program template was developed by CenterPoint Gas and Frontier & Associates who identified the need to displace electric water heating in multifamily projects. The Public Utility Commission of Texas approved the program template in 2004, and it was included in CenterPoint Electric's program portfolio the same year. Incentives levels are based upon deemed savings, which is determined by the avoided cost of demand and energy. Initial incentive levels ranged from \$250 to \$450 and remained flat until 2013. In the early years, the incentive budget was not fully utilized until gas fired boilers were allowed in 2007. In 2012, the program only received applications for gas boilers, so a decision was made to lower the incentive for boilers since it appeared as though the market was accepting that technology for water heating. To continue the transformation of the market, combo units and tankless water heating units are now included.

Coordination/Integration of Gas and Electric Utility

Due to the limited funding and nature of the program, a program brand has not been developed. There has not been a need to market the program to the public nor to developers.

This program is implemented, managed, and funded through CenterPoint Electric. Program development and outreach is vetted with CenterPoint Gas. Implementation and management is staffed with one program manager who utilizes an outside consultant for technical assistance. Inspections are conducted in-house to verify equipment installations.

Developers of multifamily projects are able to participate in programs offered by both CNP Electric and Gas. Incentives are paid directly to developers by CenterPoint Electric. However, due to an internal code of conduct, joint marketing is restricted. Funding for energy efficiency for the electric division is from an energy efficiency cost recovery rider.

All program costs are covered by ratepayer fees, and all savings reported. CenterPoint Electric verifies equipment is installed as reported. A state-appointed Evaluation, Measurement and Validation auditor reviews programs on both impact and processes.

Based on a financial feasibility study by CenterPoint Gas, incentives are available to help offset the cost of installing natural gas piping and appliances. CenterPoint Gas will also waive construction costs for natural gas main extensions to qualifying properties and provide everything up to and including the meter at no additional cost. Incentives average \$200 to \$300 per unit for individually metered gas water heating, space heating, and/or cooking. Efficiency ratings do not factor in. For master metered central boiler systems, CenterPoint Gas waives construction costs.

Motivations/Reasons That Led to Gas and Electric Utility Cooperation for This Program

CenterPoint Electric was interested in the program for mainly as a means to meet its annual demand and energy goal. Although there is a benefit to the gas company from running a fuel-switching program, the program is viewed as an electric program since electric ratepayers fund it. Since fuel switching from electric to gas appliances is allowed, there was no concern from a regulatory perspective. However, initially, there was concern some interveners would see such a program as a way to grow gas revenues while using electric funds. Due to the limited market penetration, funding and the realization that very little gas income/profit can come from this program, this is no longer seen as revenue growth opportunity. This concern is no longer an issue.

Regulatory Issues

When the state of Texas deregulated the electric industry, the rules allowed for fuel switching as long as the equipment being replaced was more efficient as stated in Rule 25.181, Section L.f.2.B.

<http://www.puc.texas.gov/agency/rulesnlaws/subrules/electric/25.181/33487adt.pdf>

From page 175, Section L.f.2.B above:

(2) Standard offer programs:

B) shall be neutral with respect to specific technologies, equipment, or fuels. Energy efficiency projects may lead to switching from electricity to another energy source, provided that the energy efficiency project results in overall lower energy costs, lower energy consumption, and the installation of high efficiency equipment.

The obstacles were changing the construction practices of developers who installed electric water heaters, which were cheaper in price and cheaper to install. CenterPoint's gas and electric divisions have separate filings for their customer programs. The gas division is not required to make filings in connection with this program.

Program performance

	2011	2012	2013
Program spending, electric	\$423,182	\$469,414	\$358,588
Savings (gross at the meter) kWh	3,470,500	2,197,500	1,376,735
Utility Cost Test (UCT)			2.5

Lessons Learned

Due to the long construction time frame, it is difficult to coordinate program information from both sides. Also, with the limited budget and the increased construction of multifamily projects in the area, it is hard to “turn off” the program from the gas perspective. That is, the gas side is in communication with the developers and architects regarding gas boilers and water heaters on an ongoing basis and is not constrained by the annual energy efficiency program budget as the electric side is in this case. Moving forward, CenterPoint Electric will begin to put limits on developer participation in the program in an effort to continue to push the market to reach additional (new) developers who have not already participated.

The electric utility is mindful about free ridership because of the timing issues. If a given multifamily developer is working on a construction project, there is a chance that electric energy efficiency program incentive funds will run out or not be available for the following program year. So if they decide to install gas equipment in advance, the risk is that they could end up as a free rider if they were to apply for ratepayer dollar-funded incentives after the fact.

CONSERVATION IMPROVEMENT PROGRAM, CENTERPOINT ENERGY OKLAHOMA

Program at a Glance

Program name	CenterPoint Energy Oklahoma Conservation Improvement Program
Targeted customer segment	Residential and commercial
Program start date	2011
Annual energy savings achieved (2013)	Gas: 5,713 Net Mcf. 58,444 therms. Electricity: No data available. Saved at the point of generation by using less gas to generate electricity.
Number of program participants	2012: 61 participants 2013: 183 participants
Spending for most recent year (2013)	\$339,396 (Rebates, trade ally incentives, delivery cost, evaluation cost, and administrative expenses for electric to gas water- and space-heating fuel-switching activities)
Funding sources	Gas: CenterPoint Energy Conservation Improvement Programs. 2014–2016 triennial program plan approved by Oklahoma Corporation Commission Cause No. PUD 201300085.
Website	http://www.centerpointenergy.com/services/naturalgas/residential/efficiencyrebatesandprograms/heatingsystemrebates/OK/
Contact for information:	
	Shea Richardson CIP Implementation Manager Arkansas/Oklahoma CenterPoint Energy (501) 377-4639 shea.richardson@centerpointenergy.com

Program Overview

CenterPoint Energy offers rebates to customers to install high-efficiency natural gas space heating and water heating equipment in place of electric equipment. These rebates are provided through three conservation improvement programs approved by the Oklahoma Corporation Commission:

SPACE HEATING CONSERVATION IMPROVEMENT PROGRAM

The CenterPoint Energy Space Heating Program is designed to promote efficient space heating solutions to residential and commercial consumers for existing homes. Rebate incentives are offered to consumers to encourage the purchase and installation of new high-efficiency natural gas furnaces with an Annual Fuel Utilization Efficiency (“AFUE”) rating of 90% or higher, direct vent wall furnaces with an AFUE rating of 80% or higher, and hydronic heating systems.

WATER HEATING CONSERVATION IMPROVEMENT PROGRAM

The CenterPoint Energy Water Heating Program is designed to promote efficient water heating solutions to residential and commercial consumers for their existing homes. Rebate incentives are offered to consumers to encourage the purchase and installation of new high-efficiency natural gas storage tank water heaters and natural gas tankless water heaters.

MULTI-UNIT MARKET TRANSFORMATION PROGRAM

The CenterPoint Energy Multi-Unit Market Transformation Program is designed to promote efficient water heating and heating solutions to multi-unit developers. Rebates are available for new construction projects. Rebate incentives are offered to multi-unit developers to encourage the purchase and installation of new natural gas water heaters and natural gas space heating systems. The equipment installed must be high efficiency. The efficiency of space heating equipment must be 90% or higher, and water heating equipment must be .62 EF or greater for storage tank water heaters or .80 for tankless water heaters.

CenterPoint Energy promotes these programs to residential and commercial consumers through local publications, bill inserts, various media avenues, and direct contact with customers, developers, dealers, and wholesalers. The CenterPoint website is also updated to include information about rebates available for qualifying natural gas equipment, information on how to secure those rebates, and all applicable forms. CenterPoint also works with dealers and retail businesses in the promotion of these programs by providing collateral material to help educate consumers on the benefits of high-efficiency natural gas equipment and how to qualify for rebates. In addition to customer rebates, dealers, installers, or retailers receive an incentive for each qualifying natural gas system they submit because they are the primary influencer on a customer’s decision to install high-efficiency natural gas equipment and therefore are the primary delivery mechanism for this program.

CenterPoint Energy uses full fuel cycle efficiency (FFCE) analysis as the basis for offering electric to gas fuel switching programs. When FFCE is taken into account, it shows that natural gas is a more efficient way to heat homes and water. The direct use of natural gas saves money for customers, uses less energy overall, and benefits the environment.

The FFCE analysis compares natural gas as a primary energy source to electricity as a secondary energy source (created from the burning of natural gas at a generation facility). Source-site ratios are used to determine the equivalent source energy units needed to fuel natural gas and electric appliances.

Steps for calculating FFCE for conversion from electric to natural gas equipment:

- 1) Determine the necessary Btu output necessary for the equipment (in this case, they use 11,080,396 for a natural gas tankless water heater, a natural gas tank water heater, and an electric water heater).
- 2) Divide the necessary Btu output for each piece of equipment by the efficiency rating to determine the necessary Btu input.
- 3) Multiply the Btu input by the source-site ratios (1.1 for natural-gas-fueled equipment and 3.34 for electric equipment) to determine the total source Btu consumption of the appliance.

Multi-Family Water Heating		Gas Tankless Water Heater	Gas Tank Water Heater	Electric Water Heater
Annual Water Heating Required (output in Btu)		11,080,396	11,080,396	11,080,396
Water Heater Efficiency		80%	62%	93%
Input in Btu		13,850,495	17,871,607	11,914,405
Annual Input in CCF and kWh		139	179	3,491
FFCE Calculation BTU		15,235,545	19,658,768	39,794,111
Source BTU Savings		24,558,566	20,135,344	
Gas Water Heater- FFCE Saving MCF		24.56	20.14	

Space heating electric to gas incentives

Equipment	Efficiency	Rebate	Trade ally rebate
Direct vent wall furnace	80% or higher	\$2,000	\$50
Natural gas forced-air furnace	90% to 94.9%	\$2,000	\$50
Natural gas forced-air furnace	95% or higher	\$2,000	\$50
Hydronic heating system	82% or higher	\$2,000	\$50

Space heating equipment eligibility

Efficiency measure heating program	Baseline comparison
Direct vent wall furnace	0.98 EF resistance heat
Natural gas forced air 0.90 EF	7.7 HSPF air source heat pump with 0.98 EF back-up resistance heat
Natural gas forced air 0.95 EF	7.7 HSPF air source heat pump with

	0.98 EF back-up resistance heat
Hydronic heating	7.7 HSPF air source heat pump with 0.98 EF back-up resistance heat

Water heating electric to gas incentives

Equipment	Efficiency	Consumer rebate	Trade ally rebate
Natural gas storage tank	0.62 EF or higher	\$900	\$15
Natural gas tankless	0.80 EF of higher	\$900	\$50

Water heating equipment eligibility

Equipment	Efficiency	Consumer rebate	Trade ally rebate
Natural gas storage tank	0.62 EF or higher	\$50	\$15
Natural gas tankless	0.80 EF or higher	\$250	\$50

Coordination/Integration of Gas and Electric Utility

These programs are administered by CenterPoint Energy and are not inter-utility coordinated EE offerings. In Oklahoma, CenterPoint is only the gas LDC, not a dual gas/electric utility.

Motivations/Reasons That Led to Gas and Electric Utility Cooperation for This Program

These programs were designed to decrease the incremental cost for a customer to switch from electric equipment to higher-efficiency natural gas equipment. FFCE analysis shows that the switch from electric to gas equipment benefits the customer and society by reducing overall energy usage and providing environmental benefits. In addition, the fuel switching programs help CenterPoint Energy mitigate the issue of declining customer counts in its Oklahoma service territory.

Regulatory Issues

The Oklahoma Corporation Commission has accepted full fuel cycle analysis, and these programs meet the goals of reduced energy usage, reduced utility service cost, and minimized environmental impact.

Program performance

Program	Participation	Electric to Gas Net MCF Savings	Cost
2012 Space Heating CIP	26	860	\$54,618
2013 Space Heating CIP	56	1,913	\$126,976
2012 Water Heating CIP	20	470	\$20,850
2013 Water Heating CIP	20	522	\$33,307
2012 Multi-Unit Market Transformation CIP (Includes space heating and water heating)	15	527	\$30,401
2013 Multi-Unit Market Transformation CIP (Includes space heating and water heating)	107	3,051	\$179,113
Total	314	8,562	\$499,422

Energy savings, gas: 85,620 therms 2012-2013

Cost effectiveness: TRC, UCT, and other cost effectiveness tests have not been applied to electric to gas fuel-switching programs for 2013.

Lessons Learned

Providing higher incentive levels for customers to switch from electric to gas has been vital to the growth seen in CenterPoint Energy's Oklahoma fuel-switching programs. It should be noted, however, that 80% of customers who replace electric space heating equipment with natural gas furnaces choose to install equipment that is 0.95% AFUE or higher even though the rebate is the same for 0.90%-94.9% AFUE equipment. One major challenge that remains is the lack of availability of high-efficiency natural gas equipment.

MASSACHUSETTS COMBINED HEAT AND POWER PROGRAM INITIATIVE, NSTAR, NATIONAL GRID, CAPE LIGHT COMPACT, WESTERN MASSACHUSETTS ELECTRIC COMPANY, UNITIL

Program at a Glance

Program name	Massachusetts Combined Heat and Power Program Initiative, NSTAR
Targeted customer segment	Key market sectors rely on heating throughout the year such as hospitals, hotels, commercial laundry, data centers, YMCAs, industrial process, laboratories, nursing homes, and colleges and universities.
Program start date	5/1/2010
Annual energy savings achieved (2013)	Gas: Not recorded Electricity (net): 54,024 annual MWh (CHP only, not energy efficiency measures taken to gain additional financial incentives. NSTAR and WEMCO only, not statewide.)
Number of program participants	22 NSTAR CHP projects 2013-14
Spending for most recent year (2013)	\$4,785,086.
Contact for information: James Ruberti Combined Heat and Power Program Manager Northeast Utilities (NSTAR/WEMCO) (781)441-8920 (339) 364-5746 James.ruberti@nu.com	

Program Overview

As a result of the Massachusetts Green Communities Act of 2008, combined heat and power (CHP) projects are eligible for funding as an electric energy efficiency measure. Generally, equipment qualifying for CHP incentives include reciprocating engines, gas turbines, fuel cells, and back pressure turbines. It is important to note that for the purposes for receiving an incentive under the program, a CHP system must directly produce electricity while capturing the waste heat for free heating and or cooling and not simply offset the use of electricity. Key market sectors rely on heating throughout the year such as hospitals, hotels, commercial laundry, data centers, YMCAs, industrial process, laboratories, nursing homes, and colleges and universities.

The incentives for CHP range up to \$750.00 per KW. A CHP customer may also qualify for up to \$1,200.00 per kW by installing other energy-efficient measures within an allotted time frame. The functionality of the program is designed to help customers pursue CHP from concept to commissioning. This includes expert analysis, project review, compliance

guidance, and co-funding on independent engineering studies. CHP has long suffered from lack of education, lack of incentives, long sales cycles, vendor movement into and out of the marketplace, poor equipment, and direction. Utilities working directly with their customers and guiding them through the exhaustive process should create confidence and streamline the once arduous processes.

Coordination/Integration of Gas and Electric Utility

The coordination of program administrators, comprised mostly of electric and gas utilities, was critical for the development and implementation of the Mass Save CHP program. The program administrators worked collaboratively to form a CHP working group. This group of experienced industry professionals worked closely to help write and define the CHP program guide criteria. After close review and many edits, Cape Light Compact, National Grid, Northeast Utilities (NSTAR and Western Massachusetts Electric Company), and Unitil put their stamp on the document, and the program was implemented through Mass Save. In short, the utilities sat down and wrote the CHP guidebook together. It was a year-long collaborative process. The CHP working group then gave the workbook to the management of each organization to sign off on.

Internally at Northeast Utilities, a new CHP program manager was hired to assist customers through the process of CHP projects from concept to commissioning. The new position brings clarity to the industry and works closely with the other Massachusetts utility companies to help develop CHP projects throughout Massachusetts. For this program to have success, both electric and gas representatives need to work together to identify potential candidates for CHP and then educate those candidates on how the program works. Each project has a two- to three-year lead time, and the program manager aims to shorten this to maximize the results achieved with ratepayer dollars.

Motivations/Reasons that Led to Gas and Electric Utility Cooperation for This Program

The driving force behind the CHP program in Massachusetts was originally the Green Communities Act signed into law in 2008. This law required that all program administrators in Massachusetts have 20% of their distribution created by distributed generation by 2020. This includes; solar, wind, tidal, renewable, and CHP. It is recognized that CHP positively impacts carbon footprint, increases system operation and efficiencies, and provides resiliency.

Both utility representatives can use their large customer databases to pinpoint potential CHP candidates. In regards to which utility side takes “credit” if a customer installs a CHP system, the electric utility will claim the KW reduction and the gas utility will claim the throughput of natural gas. The electric utility will get kWh savings credit for additional efficiency measures beyond the CHP system itself. It is also important to note that a CHP project opens an array of projects for electrical and thermal reduction as well. The CHP program is driven by the electric utility; all incentives, metering, and verification and costs are approved and paid for by the electric side. This also holds true for co-funded CHP engineering studies or engineering peer reviews.

In the past, CHP had long suffered from lack of education, lack of incentives, long sales cycles, vendors in and out of the marketplace, poor equipment, and direction. Gas utilities generally were very favorable to CHP because it was almost like fuel switching, and the electric utilities did not like it because they lost load. Now, since the Green Communities Act, the electric utilities are highly supportive of distributed generation and have financial incentive for the KW. It gives the system resiliency and reduces carbon emissions.

Regulatory Issues

The regulatory framework for this program was created by the implementation of the Green Communities Act 2008. In Massachusetts, CHP is acknowledged as a measure supportable by various incentives through commercial and industrial energy efficiency programs. Regulation is not a barrier for CHP in Massachusetts; it is a support. The Department of Energy Resources wants more CHP for the resiliency of it and its grid-independence.

Program performance, Northeast Utilities, Massachusetts

	2011	2012	2013
Number of CHP projects	7	15	7
Customer incentives	\$5,681,250	\$3,438,989	\$4,285,086
Net annual kWh savings	66,605,260	27,092,399	54,024,180
Net lifetime MWh	1,624,491	512,074	1,200,516

Lessons Learned

CHP can be a major contributor in kWh reduction. In Massachusetts, CHP qualifies as a standalone energy efficiency measure. However, the CHP program incentive structure is such that it is being leveraged to maximize energy efficiency kWh savings. This is accomplished by linking higher incentives for additional facility and building energy efficiency measures implemented during CHP construction.

While there is currently an 8 MW target for 2015 and beyond, a dramatic increase in CHP systems small and large is anticipated. There is no forecast for how many kWh of energy savings will be achieved, as it is very site specific and the approach is to be very flexible. The funding will be there.

There are challenges associated with implementing this technology. CHP works within a small internal rate of return (IROR) – customer band width. It is very costly, demands year-round heating loads, and requires a long commitment from the customer, both financial and operational. Additionally, considerable analysis and study of the existing electric distribution and natural gas transmission systems and interconnect protocols are required to ensure that implementing the proposed system is viable and can be done safely. As a result, CHP projects typically are slow to develop and can suffer from long lead times and, in some cases, customer indifference. Most of these issues can be overcome through education and program-administrator-backed commitment.

COMMERCIAL AND INDUSTRIAL PROGRAMS, MASS SAVE NSTAR

Program at a glance

Program name	Mass Save Small Business Program Mass Save New Construction and Major Renovation Mass Save Large Retrofit Program					
Utilities and program administrators involved	This profile covers the NSTAR Electric & Gas portion of the programs. Berkshire Gas, Blackstone Gas Company, Cape Light Compact, Columbia Gas of Massachusetts, Liberty Utilities, National Grid, Unitil, Western Massachusetts Electric are all part of Mass Save.					
Targeted customer segment	Small commercial, large commercial and industrial					
Program start date	2011					
Annual energy savings achieved (2013)	New construction		Large retrofit		Small business	
NSTAR electric (MWh)	99,241		196,334		46,801	
NSTAR gas (therms)	1,212,013		1,704,455		130,947	
Number of program participants	New construction		Large retrofit		Small business	
	2013	2012	2013	2012	2013	2012
NSTAR Electric	312	442	515	1215	1,688	2596
NSTAR Gas	188	357	170	451	515	574
Peak demand (summer) savings achieved	New construction: 19,016 kW Retrofit: 19,694 kW Small business: 14,466 kW					
Spending for most recent year (2013)	New construction		Large retrofit		Small business	
NSTAR Electric	\$21,968,516		\$38,804,677		\$25,929,262	
NSTAR Gas	\$2,362,173		\$3,213,748		\$159,933	
Funding sources (name and description)	Ratepayer funding, Regional Greenhouse Gas Initiative, Forward Capacity Market					
Website	http://www.masssave.com/business					

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Program Overview

The Mass Save Small Business, New Construction and Major Renovation, and Large Retrofit programs (C&I programs) are collaborations of all program administrators (PAs) in the commonwealth of Massachusetts. NSTAR Electric & Gas is a leading PA in this program. Though a dual-fuel utility, the majority of NSTAR Electric's and NSTAR Gas's territories are single fuel. This requires NSTAR to coordinate with other PAs to deliver energy-blind programs to customers.

Through the statewide C&I programs, NSTAR approaches its customers by size and by market segment. Customers are channeled into different programs by energy consumption. The New Construction and Major Retrofit program provides support for customers planning large projects and seeks to get involved in the process early on. The Small Business and Large Retrofit programs are designed to serve existing customers who wish to upgrade equipment already in place.

Customers who use 300 kW or less per month are eligible for the Small Business program. Participants receive an on-site energy assessment, lighting upgrades, hot water measures (such as faucet aerators), boiler controls, and detailed energy efficiency recommendations. PAs pay up to 70% of installation and equipment costs, and 0% financing is available for customers for the remaining 30%. The electric PA hires firms to conduct the energy assessments and undertake the direct installation of measures within its service territory. The electric PA claims the electric savings and attributes the gas savings to the appropriate gas PA. The assessment covers electric, gas, and oil measures. If the customer elects to undertake any of the recommended gas measures, the gas PA then provides the incentive and takes the savings.

The Large Retrofit program targets larger customers. At NSTAR Electric & Gas, teams of account executives, program managers, and engineers work with the largest customers to identify energy-saving opportunities and provide incentives to implement them. These teams are assigned to customers based on market segment in order to concentrate expertise, experience, and relationships. There is also a dedicated new construction team that works with the market-based teams on dedicated projects. Engineering firms that have established relationship with the PAs can serve as project expeditors. These firms can bring projects through the approval process rapidly and are encouraged to seek out midsized customers. Collectively, these programs address the following end uses: combined heat and power, compressed air, energy management systems, food service equipment, heating, ventilating, air-conditioning (HVAC) equipment, lighting and lighting controls, motors and variable-speed drives, networked lighting controls, process and manufacturing equipment, vending

misers, and water heaters. As with the Small Business program, any energy engineering studies are fuel blind and return savings recommendations for electric, gas, and oil. Electric or gas PAs reach out to engage a customer individually but may co-fund engineering studies. Once measures are identified, the gas PA funds and claims savings for any gas measures and the electric PA funds and claims savings for any electric measures.

GasNetworks laid the groundwork for statewide collaboration. This collaboration of gas utilities was established in 1997 to lead market transformation efforts. This group has harmonized program offerings and shared the administrative expense of developing and processing rebate forms and serves as a common point of communication with trade allies. When, in 2008, the commonwealth of Massachusetts passed the Green Communities Act calling for statewide programs, utilities began to work even more closely together by developing statewide plans for energy efficiency and establishing the Mass Save brand.

Coordination/Integration of Gas and Electric Utility

The PAs created a statewide “Mass Save” brand when they launched www.masssave.com in 2010. This common website describes the overall program and drives customers to individual PA websites to get direct help.¹⁶ Statewide prescriptive rebate forms are also available on this website. Mass-market advertising to homeowners and small businesses is conducted under the Mass Save brand, supplemented in many cases by individual PA efforts to promote specific programs to target audiences.

The Green Communities Act of 2008 did not specify the creation of the Mass Save brand, but it was strongly encouraged by the Energy Efficiency Advisory Council (EEAC) and by the state to foster trust as a central location for information. In a paper describing the Mass Save collaborative model, authors from state agencies, PAs, and consultants stated that as:

savings goals increased, it became clear that a collaborative approach was needed not only with the individual gas and electric programs, but across the state, among all PAs, and between both the gas and electric programs. This was crucial to maximize the savings with each customer, capture economies of scale, minimize customer confusion, and meet the goals of the Green Communities Act. It was incumbent on everyone in the energy-efficiency industry in Massachusetts to move forward with one common message and one call to action, regardless of utility provider. This was the driving force behind the creation of Mass Save.¹⁷

¹⁶ <http://www.pixelmedia.com/garage/online-branding-creating-mass-save-identity#.U02QHajIn4>

¹⁷ C. Halfpenny, F. Gundal, C. White, J. Livermore, D. Baston, P. Mosenthal, M. Guerard, and G. Arnold, *Mass Save: A New Model for Statewide Energy Efficiency Programs*, ACEEE Summer Study on Energy Efficiency in Buildings, 2012.

Each PA has staff to plan, implement, and evaluate programs as well as to manage vendors. As stated above, each PA hires vendors to work within its own territory to identify and deliver programs. Energy assessments look for electric, gas, and oil savings and are co-funded by electric and gas PAs. Each PA then provides incentives and claims electric and gas savings as appropriate to the fuel it provides.

To coordinate among programs, representatives from each PA meet in a statewide committee. The PAs coordinate on forms, the website, and advertising. This enables them to save individual resources which in turn allows for streamlining programs and scope for innovation.

Both gas and electric programs are funded through a ratepayer mechanism, and electric programs are funded through proceeds from Regional Greenhouse Gas Initiative and Forward Capacity Market auctions.

Motivations/Reasons That Led to Gas and Electric Utility Cooperation for This Program

Gas PAs began collaborating through GasNetworks in 1997 to increase market impact through coordinated programs and to share administrative costs. Electric and gas PAs continued to work together informally to provide a consistent customer experience. This effort was formalized and expanded when the Green Community Act was passed in 2008. This act provided funding and a mandate for utilities to provide all cost-effective electric and gas energy efficiency as well as the structures for statewide collaboration. It does not explicitly call for cross-fuel participation, but the PA collaboration brings electric and gas utilities together and fosters the communication necessary for dual-fuel programs. The PAs developed the first statewide three-year plan for 2010–2012 as mandated by the act and a second was developed for plan years 2013–2015. Both of these were approved by the Massachusetts Department of Public Utilities. The PAs have been delivering on these plans ever since.

Regulatory Issues

Two state entities oversee and advise the PAs in their efforts to achieve all cost-effective energy efficiency. The Massachusetts DPU has oversight over the PAs, and each PA files a separate plan and report which are rolled up into statewide documents. Each PA sets efficiency targets as a percentage of sales, and the DPU is responsible for determining whether the PAs are meeting their goals in a cost-effective manner.

The EEAC was created by the Green Communities Act. The EEAC guides “the development of nation-leading energy efficiency plans” and develops “a longer term vision for the Commonwealth’s energy future.”¹⁸ The EEAC members represent both citizen groups

¹⁸ <http://www.ma-eeac.org/General%20Information.html>

(residential consumers, low-income weatherization and fuel assistance program network, environmental advocates, C&I customers, energy efficiency advocates, and organized labor) and the Massachusetts state agencies (Department of Environmental Protection, Attorney General, Executive Office of Housing and Economic Development, and Department of Energy Resources). All the program administrators, including the larger utilities, are members of the EEAC.

The framework established by the Green Communities Act has enabled innovative collaboration, but it has also greatly increased the regulatory and administrative burden. As more has been expected of PAs, more reporting has been required. The amount of data and information coordination among the PAs has increased, which in turn has increased the administrative burden. PAs have been successful in working with regulators to reduce this burden over time as all parties learn from the experience. Creation of consistent rebates and other materials has also created a high administrative burden.

Consistency has been good for customers, but the differences among PAs have also been challenging. Smaller PAs often have fewer resources to deliver on goals, and large PAs have often taken the lead in initiatives. This has benefited the small PAs at the same time by providing them additional resources and scope for innovation that they may not have otherwise had. All PAs have benefited from some efforts, such as statewide requests for proposals on programs that have allowed for administrative efficiencies. Finally, the increased scope has allowed for innovative program designs, such as financing programs or upstream initiatives.

Consistency has also benefited many stakeholders beyond customers. Consistent reporting of energy savings help ISO New England and regulators to better understand the impact of programs by increasing the reliability of the savings numbers.

Program Performance

Program spending actual (per year, most recent three years)

2013	New construction	Large retrofit	Small business
NSTAR Electric	\$21,968,516	\$38,804,677	\$25,929,262
NSTAR Gas	\$ 2,362,173	\$ 3,213,748	\$ 159,933
2012			
NSTAR Electric	\$22,452,960	\$46,754,133	\$22,312,823
NSTAR Gas	\$ 1,858,951	\$ 2,327,164	\$ 188,974
2011			
NSTAR Electric	\$12,412,122	\$28,296,542	\$21,435,229
NSTAR Gas	\$1,497,218	\$1,257,958	\$ 113,843

Program energy savings

2013 gross lifetime	New construction	Large retrofit	Small business
NSTAR Electric (MWh)	1,355,182	2,874,191	531,432
NSTAR Gas (therms)	24,718,690	20,460,141	1,047,128
2012 net lifetime			
NSTAR Electric (MWh)	1,116,430	2,741,440	562,524
NSTAR Gas (therms)	12,630,618	16,072,465	1,189,057
2011 net lifetime			
NSTAR Electric MWh)	720,466	3,176,789	581,824
NSTAR Gas (therms)	9,401,619	6,534,499	1,176,949

Impact evaluations:

<http://www.ma-eeac.org/EMV.html>

Quarterly reports (Including 2013) <http://www.ma-eeac.org/Quarterly%20Reports.html>

2012 reports: <http://www.ma-eeac.org/Year%202012%20Results.html>

2011 reports: <http://www.ma-eeac.org/Year%202011%20Results.html>

Cost-effectiveness results:

Total resource cost

2012	New construction	Large retrofit	Small business
NSTAR Electric	4.23	4.00	3.14
NSTAR Gas (therms)	3.55	3.02	6.93

Lifetime cost of conserved energy (CCE) in \$0.00 per kWh and/or therm

2013	New construction	Large retrofit	Small business
NSTAR Electric	\$0.02	\$0.01	\$0.05
NSTAR Gas (therms)	\$0.10	\$0.16	\$0.15

Lessons Learned

The PAs completed an evaluation study in 2012 which included a high-level assessment of the integration between gas and electric PAs. It also focused on integration as it relates to gas and electric projects involving different PAs rather than project integration within the same PA. At the time, the study was done integration was just being rolled out, so only 42 customers were interviewed and very few customers did integrated projects involving multiple PAs. Further, this study is dated, looking at 2010 participation, and the PAs have learned a great deal since then.

The Massachusetts Large Commercial & Industrial Process Evaluation, 2012 found that "86% (of respondents) said that both energy providers were involved in the project."¹⁹ In other words, gas and electric PAs were active in projects involving both gas and electric measures. Further, when customers were surveyed "57%...said that the project went 'somewhat well' or 'very well.'" The involvement of the multiple PAs does not appear to have hindered or hurt project execution since "82% said the involvement of both utilities had no effect on the project timing." Unfortunately, "Fewer than 10% of all responding participants reported completing combined electric and natural gas projects through separate PAs." Since the number of customers in the NSTAR service territory served by multiple program administrators is much higher than that. We conclude that many opportunities for collaboration were missed during the timeframe of this evaluation.

Another important barrier found in respect to gas and electric integration was that many vendors serving the midsized and direct-install segments are traditional lighting contractors who do not have a strong knowledge of gas measures. This is currently viewed as a barrier to electric and gas program integration for the segment. Another study "found that many midsize businesses are well served in lighting measures, which are typically handled through the Direct Install program; fewer customers were found to have heating, refrigeration, or motor and drive measures installed."²⁰ NSTAR is taking steps to address this by providing training to its Direct Install program vendors. It is also possible that the

¹⁹ DNV KEMA, *Massachusetts Large Commercial & Industrial Process Evaluation (Project 10): Final Report*, July 20, 2012, http://www.ma-eeac.org/Docs/8.1_EMV%20Page/2012/2012%20Non-Residential/Project%2010%20final%20report.pdf.

²⁰ DNV KEMA, *Mid-Size Customer Needs Assessment: Final Report*, December 22, 2013, 2014, http://www.ma-eeac.org/Docs/8.1_EMV%20Page/2013/Commercial%20&%20Industrial%20Program%20Studies/Mid-Size%20Customer%20Needs%20Assessment%20Final%20Report%2012.22.13.pdf

impact of this may be minimized since many small businesses do not have devoted heating systems but rather have shared systems. These shared systems could be picked up through the large C&I programs as the property manager would be submitting an application.

The final lesson is that PAs need to be consistent in the terminology they use and how they report results. For example, each PA needs to count participation the same way either by the total number of thermostats installed or the total number of customers who receive thermostats (each one may receive multiple thermostats). Such consistency of terms increases the trust among the PAs and with regulators and allows for further innovation and development of programs.

CONNECTICUT HOME ENERGY SOLUTIONS™, CONNECTICUT LIGHT & POWER, THE UNITED ILLUMINATING COMPANY, CONNECTICUT NATURAL GAS, SOUTHERN CT GAS, AND YANKEE GAS

Program at a Glance

Program name	Connecticut Home Energy Solutions
Targeted customer segment	All residential customers; focus on single-family, owner-occupied homes
Program start date	2007
Annual energy savings achieved (2013)	Gas: 989,184 annual ccf; 18,476,633 lifetime ccf. Electricity: 18,902,899 annual kWh; 195,098,971 lifetime kWh
Number of program participants	2013: 26,391 total units including multifamily buildings with 5+ units, HVAC rebates and 12,761 1–4 family homes. ²¹
Peak demand (summer) savings achieved	3,405 kW
Other measures of program results to date	Additional metrics applicable to 1–4 family homes, 2013: Average MMBTu saved per household: 15.0 Customers taking action on further rebated measures: 17% Customers utilizing on-bill financing: 4%
Spending for most recent year (2013)	Electric: \$19,000,142 Gas: \$5,404,385
Funding sources	Gas: Conservation Adjustment Mechanism Electric: 3 mil charge on customer's bills Deliverable Fuels: Regional Greenhouse Gas Initiative, Forward Capacity Market and Class III Renewable Energy Credits
Website	www.energizect.com

²¹ Participant and other measure data available at: www.ctenergydashboard.com on the “HES Activity Report” tab. These data are only pertinent to 1–4 family homes

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Program Overview

The Home Energy Solutions™ core services program targets 1-4 unit residential dwellings. A multifamily initiative is also funded through the Home Energy Solutions™ budget; however, it is not the focus of this write-up. The program targets heating, cooling, domestic hot water, and lighting end uses through a variety of measures. These include blower-door-guided air sealing, duct-blaster-guided duct sealing, high-efficiency (CFL or LED) lighting upgrades and domestic hot water saving measures. The program is provided by Connecticut's electric and gas companies (Yankee Gas, Connecticut Natural Gas, Southern Connecticut Gas, Connecticut Light and Power, and United Illuminating), funded by ratepayer collections, and is delivered through home performance contractors selected biannually through a competitive request for proposals. The selected contractors are paid directly by the companies for the installation of qualifying EEMs. Contractors are evaluated monthly and must achieve a minimum energy savings per home in order to remain under contract with the companies.

In addition to the direct-install measures, a suite of rebates for deeper energy savings measures is available through the HES program. These are tabulated in Figure 1. The program has been well received and grown tremendously over the years. HES began as an electric duct sealing pilot in 2006. Later in that year, the three natural gas companies in Connecticut (Yankee Gas, Connecticut Natural Gas, and Southern Connecticut Gas) began offering weatherization and hot water saving measures in conjunction with the duct sealing pilot, thus providing customers with one-stop shopping for comprehensive energy efficiency services. In 2006, over 2,000 customers were served by four participating HES program vendors.

HES continued to grow, and in 2007, program participation more than doubled and over 6,000 customers were served. In 2008, a formal training and certification process was rolled out requiring Building Performance Institute (BPI) Building Analyst 1 Certification for all participating vendors. The program continued to grow and served 8,895 customers in 2008. By 2009, the program had grown to 19 vendors with over 200 technicians. In late 2009, the companies applied to the U.S. EPA Home Performance with ENERGY STAR Program to have HES recognized as a program participant. Based on HES's current program offering and the promotion of comprehensive services and measures, HES met the criteria, and in early 2011, Connecticut was recognized as a U.S. EPA Home Performance with ENERGY STAR state.

In late 2010, an RFP was issued to select vendors for the 2011 HES core services program and 48 responses were received. The RFP selection criteria included cost for services,

technical certifications and qualifications, state licensure requirements, mandatory equipment, and overall experience. From the RFP respondents, 26 companies were selected to deliver the program. Another RFP was issued in late 2012, resulting in a total of 30 vendors selected to deliver core service to customers. Currently, it is estimated that over 300 jobs in Connecticut are directly attributed to the HES program while there are numerous subcontractors in the HVAC, insulation, and home improvement trades that benefit from the HES program by performing energy efficiency add-on upgrades that are recommended during the HES visit. Therefore, HES continues to provide both energy savings to customers as well as economic development through job creation and retention throughout Connecticut.

In 2012, a mobile application was developed to streamline data collection and generate custom reports for the customer to enhance the kitchen table wrap-up experience. As the program has grown, the vendor base has been successfully managed using a report card that evaluates contractor performance based on energy savings achieved in each home, field inspection results, customer surveys, and compliance with program rules.

Coordination/Integration of Gas and Electric Utility

The HES program is branded with its own trademarked, program name. However, it is always presented under the statewide brand – “Energize Connecticut,” which showcases all five utility company logos.



The companies have a limited marketing budget for the HES program and focus efforts on general awareness, as well as direct mail. Vendors are expected to solicit leads on their own and are provided marketing standards to develop their own materials. The majority of program leads are word of mouth referrals from neighbors and friends.

The program is staffed with employees of Northeast Utilities and United Illuminating. It is administered jointly and uniformly. The only difference is the tracking and reporting systems: Each utility holding company uses its own system. Northeast Utilities owns and operates Connecticut Light & Power and Yankee Gas, and UIL Holdings owns and operates the United Illuminating Company, Connecticut Natural Gas, and Southern Connecticut Gas. There is not perfect overlap of gas service territory with electric territory.

Vendors are selected jointly and enter into purchase agreements with the companies. They are paid directly by the companies for measures installed. (See table below illustrating cost splits.)

The following table itemizes the cost share by utility company. Electric companies report the electric, oil, and propane savings. The gas companies report CCF only. There is a statewide report called the “HES Activity Report” where data are matched by home.

HES	All electric	Gas heat w/CAC	Gas heat no CAC	Oil + pro w/CAC	Oil + pro no CAC
	Elec (%)	Elec./gas (%)	Elec./gas (%)	Elec./oil (%)	Elec./oil (%)
Administration	100	50/50	30/70	30/70	15/85
Blower door	100	15/85	0/100	10/90	0/100
Air flow/heat rise test	100	60/40	25/75	35/65	10/90
Duct blaster	100	60/40	25/75	35/65	10/90
Installation of lighting	100% to electric				
DHW and pipe insulation	100% to the DHW source				
Clothes washer	100% to electric				
Appliances	100% to electric				
Windows	100	25/75	0/100	5/95	0/100
Insulation	100	10/90	0/100	5/95	0/100

A portion of the ratepayer charge is used for third-party evaluations of programs. There is an evaluation committee that oversees the process and selects the evaluation vendors. Programs are evaluated every several years. HES was evaluated in 2010, and an evaluation for the 2012-2013 program years is currently underway.

Motivations/Reasons That Led to Gas and Electric Utility Cooperation for This Program

Connecticut has a high percentage of homes heated with deliverable fuels while funding for conservation programs comes predominantly from regulated fuels. By bundling measures to achieve an overall cost-effective program with ratepayer funding and offering low-cost direct installation of energy-savings measures, it are able to achieve savings and provide benefits to the residents.

In 2013, the companies launched the Energize campaign in two communities, leading with conservation, providing the focus and outreach efforts to residents that were on the gas main or within the gas main extension. The objective was to introduce residents to the CLM programs and services and provide them with additional resources for special insulation and HVAC upgrades and pricing and financing as well as gas conversions. As an example, in one of the communities, a total estimated 175,068 kWh of electricity, 11,766 ccf of natural gas, and 8,802 gallons of oil annually were saved. In 2014, two more communities will be piloted.

It is noteworthy that the state statute concerning the implementation of the Comprehensive Energy Strategy requires state agencies, including the Clean Energy Finance and Investment Authority (CEFIA), Department of Energy and Environmental Protection (DEEP), and the Energy Conservation and Management Board (ECMB), to set up the pilot to include incentives to install efficient equipment and improve the efficiency of building envelopes, in addition to fuel conversion. The gas and electric utilities jointly promote the initiative to

residential customers on the gas main or within the gas main extension to areas previously only served by deliverable fuels. Important features of the program are that it also provides similar incentives for those who cannot cost-effectively convert to gas and provides access to low-cost financing to both customer groups.

Areas where the utilities are able to share resources and eliminate duplication of cost or effort include:

- *Staffing.* Human resources are billed between companies.
- *Marketing.* As the program is statewide, marketing campaigns, events and sponsorships are cost shared between companies based on the territory they are targeting or if statewide, filed cost shares UI/CL&P/SCG/CNG/Yankee
- *Purchasing.* All RFPs are managed jointly and the purchasing departments alternate managing bids.
- *Information technology (IT).* A statewide mobile application is used for data collection in the field. It is compatible with both electric companies' tracking and reporting systems.
- *Quality control.* Inspections are cost shared between the appropriate gas and electric utility.

Regulatory Issues

In accordance with Connecticut General Statutes § 16-245m and § 16-32f, the companies (CL&P, UI, CNG, SCG, and Yankee Gas) submit a multiyear comprehensive Conservation & Load Management Plan (C&LM; three-year plan) (2013-2015) for the implementation of cost-effective electric and natural gas energy efficiency programs and market transformation initiatives.

This is the 14th C&LM Plan prepared by the electric companies since passage of the state's restructuring legislation (Public Act 98-28) and the seventh plan filed by the natural gas companies since passage of the state's energy independence legislation (Public Act 05-01).

In conjunction with the Energy Efficiency Board ("EEB") (formerly the Energy Conservation Management Board) and the EEB consultants, the companies have developed and deployed cost-effective, integrated electric and gas efficiency, and conservation programs to all classes of energy consumers throughout the state.

On June 14, 2012, the Department of Energy and Environmental Protection ("DEEP") released the 2012 Integrated Resource Plan (IRP).

The DEEP developed the first-ever Comprehensive Energy Strategy for the state of Connecticut – an assessment and strategy for all residential, commercial, and industrial energy issues, including energy efficiency, industry, electricity, natural gas, and transportation. This strategy was developed as called for in the milestone energy legislation, Public Act 11-80, passed in June of 2011. Section 51 of this act requires that DEEP, in

consultation with the Connecticut Energy Advisory Board (CEAB), prepare a Comprehensive Energy Strategy for Connecticut every three years.

The fifth major point the CEEB made in its review of the 2012 Electric and Natural Gas C&LM Plan was:

Whether in Home Energy Solutions, Small Business Services, or C&I Retrofit, the focus of the 2012 programs is on comprehensive, whole-building, multi-fuel efforts to provide significant energy savings to customers. Rather than delivering lower levels of savings in a one-shot, single measure approach, the programs engage and offer each customer a complete package of integrated and multi-fuel opportunities to save energy, resulting in higher cost savings on the customer's utility bill.

Integrated programs across the electric and natural gas companies provide opportunities for cross promotion to shared customers, are more convenient for customers, reduce costly duplication of effort, and enhance the quality of the energy efficiency services provided. A single, integrated electric and gas 2012 Plan supports and enhances the integrated programs.²²

²² Re: Energy Efficiency Board Letter of Support for the 2012 Electric and Natural Gas Conservation and Load Management Plan. Docket No. 11-10-03 – Review of the 2012 Electric and Natural Gas Conservation and Load Management Plan at:
http://energizect.com/sites/default/files/111019%202012Plan%20EEB%20Letter%20of%20Support%20F_0.pdf

Program performance

Spending			
	2011	2012	2013
Electric	\$18,397,057	\$19,000,142	\$16,041,653
Gas	\$4,116,657	\$4,470,689	\$5,404,385
Total	\$22,513,714	\$23,470,831	\$21,446,038
Savings			
Net gas (ccf)	610,773	783,225	989,184
Net electric (kWh)	19,731,032	19,076,473	18,902,899

HES	Planned electric B/C ratio	Planned total resource B/C ratio
2013	1.54	2.22
2014	1.47	2.06
2015	1.59	2.04

The screening model for the TRC for HES includes all of the electric/oil/propane benefits plus nonelectric benefits for water benefits and the value of emissions reductions associated with the reduced kWh. Connecticut does not include other non-energy benefits that some other states (MA, RI) use for their TRC.

Lessons Learned

In designing the program delivery, an important consideration was that the electric/gas coordination needed to be behind the scenes. The program that was presented to the customer base was seamlessly integrated, and all coordination and cost allocations are done between the companies.

Other lessons learned include the following:

- *Contractor.* The companies must work together to provide a uniform face to the vendors. The same contractors must be able to install all measures.
- *Customer.* One-stop shopping is critical; customers do not want to have to set up multiple visits.
- *Program administrator.* Budgets must be aligned during the program design. For example, in 2012, the companies received approval for a double gas budget, with a base electric budget. The gas savings could not be achieved without the electric support.
- Cost shares for all types of expenditures, including non-incentive line items, should be set based on the benefits that the measure provides to the respective utilities.

PRODUCTION EFFICIENCY (PE), ENERGY TRUST OF OREGON

Program at a Glance			
Program name	Production Efficiency (PE)		
Targeted customer segment	Industrial and agricultural customers		
Program start date	Electric-only, 2002; combined gas and electric since 2009		
Annual energy savings achieved (2013)	Gas preliminary results: 1,050,000 therms Electric preliminary results: 16.8 aMW (i.e., 147,443 MWh)		
Number of program participants	2011	2012	2013
	Sites served	747	794
Spending for most recent year (2013)	Preliminary \$27.6 million		
Funding sources	Gas: Non-transport ratepayers served by Northwest Natural Gas and Cascade Natural Gas. Electric: ratepayers served by Portland General Electric and Pacific Power		
Website	http://energytrust.org/industrial-and-ag/		
Contact for information: Kim Crossman Industry & Agriculture Sector Lead Energy Trust of Oregon (503) 459-4074 kim.crossman@energytrust.org			

Program Overview

All end uses and all sizes and types of industrial and agricultural customers in Energy Trust territory, including high-tech manufacturing, food processors, forest products, pulp and paper, and greenhouses, are included. The top measures for electric savings are multisystem, lighting, secondary process, primary process, compressed air, irrigation, refrigeration, process pumping and HVAC. Top gas-saving measures include greenhouses (infrared polyethylene greenhouse cover, high-efficiency condensing-type boiler, thermal curtain, under-bench heating, intelligent greenhouse controller with night setback), secondary process, HVAC, multisystem, and boilers.

The program is organized around and achieves both electrical and gas savings through two primary pathways to market: the custom track and the streamlined tracks. Each is targeted to specific industry needs and/or market segments with differing complexity, delivery channels, and development cycles.

The custom track is delivered by program delivery contractors (PDCs) acting as energy efficiency account managers. The custom track includes capital, operations and maintenance (O&M) measures, and strategic energy management (SEM) offerings. By performing custom analysis and verification of savings for each project, the program has the flexibility to work with large industrial retrofits, unique process improvement projects, and emerging technologies and practices. The custom track works with all sizes of industries, which are provided energy efficiency services and incentives to drive deep and persistent process efficiencies.

Energy Trust offers cash incentives, calculated on an individual case-by-case basis for almost any type of energy efficiency project with savings that can be quantified through a study and verified. PE provides free custom technical analysis studies through qualified allied technical assistance contractors. Custom incentives for capital projects are \$0.25/annual kWh saved and \$2.00 per annual therm saved, capped at 50% of eligible project costs.

Production Efficiency offers \$0.08/kWh and \$0.40/therm of up to 50% of the project cost for custom O&M projects. For custom O&M projects that are implemented within 90 days of the incentive offer, the Energy Trust offers the same incentives but for up to 90% of implementation costs.

The streamlined tracks rely on market actors such as trade allies and other vendors to deliver industrial lighting and calculated and prescriptive measures. Trade allies are recruited and provided with calculated savings tools and a simplified incentive process. This is effective for standard measures where savings are easily calculated by common formulas with a small number of inputs. It streamlines program participation and reduces the cost of delivery, enabling a cost-effective approach to smaller projects.

Prescriptive incentives are used primarily on the trade ally track, i.e., when measure savings, incentives, and cost effectiveness have been pre-established by Energy Trust. Application for incentives is made by customers after purchase, and savings and incentives are determined based on a single input such as number of widgets, for example, number of irrigation nozzles. Prescriptive projects include pump vfds, milk cooling, welders, irrigation systems, compressed air, fast-acting doors, and fans and prescriptive projects for irrigation, greenhouses, HVAC, insulation, compressed air, and gas heating.

Sites participating in Energy Trust's Strategic Energy Management initiatives receive valuable free training, technical support and coaching to establish or develop a comprehensive Strategic Energy Management (SEM) program at their plant. Incentives for energy savings during implementation of an SEM offering are \$0.02/annual kWh saved or \$0.20/annual therm saved.

The PE program started in 2003 as one of Energy Trust's first programs, and has remained a significant and highly cost-effective portion of the Energy Trust efficiency portfolio. In 2007, program management was brought in house, and program volume for the PE program has

more than quadrupled since then. Currently, PE completes close to 1,000 projects a year and expects this to be about the same or higher in 2014.

Coordination/Integration of Gas and Electric Utility

Energy Trust goes to market as a single entity with a host of complementary electric and gas energy efficiency offerings to meet the customers' energy efficiency needs. In effect, Energy Trust is a one-stop shop for energy efficiency, leveraging its internal resources across all programs and fuel types to make it easy for customers to access energy efficiency services for the two major energy types. Energy Trust branding and marketing resources are shared, although specific messages may be tailored based on the market niche, targeted technology, and marketing goals.

Energy Trust acknowledges its utility funders in media and online marketing, but the exact way this is done varies depending on the nature of each piece and campaign. For industrial customers, in-person outreach from Energy Trust staff and contractors is the primary sales strategy, and media and online marketing plays a much lesser role. In some cases the contacts are made with or by utility representatives. In particular, for PE, the utility account managers for large customers collaborate with the program to promote it. For example, when gas offerings for industry were launched in 2009, the gas utility account managers were instrumental in notifying their customers of the new program and providing leads. For these account managers, being able to connect their customers with a highly effective efficiency program is a valued part of their customer service, and Energy Trust's success is their success.

Energy Trust administers all aspects of the vendor and implementer relationships. It qualifies contractors to work with its customers based on their firm's technology specialty. For all Energy Trust programs and offerings it leverages its economies of scale. Energy Trust makes no significant differentiation in administering the staffing, evaluation, reporting, and so on by fuel source. Energy Trust is pragmatic and will tailor approaches to electricity and natural gas programs where appropriate or necessary (i.e., developing cost-effective offerings based on energy type avoided costs). Funding sources from the four utilities for Energy Trust are relatively the same: a public purpose charge. Funding for electric energy efficiency is also augmented by an additional ratepayer surcharge negotiated on an annual basis with its electric utilities and the Oregon Public Utility Commission. This was implemented in 2008 as part of SB838 and the legislature directing Energy Trust to capture all cost-effective energy efficiency savings.

Motivations/Reasons That Led to Gas and Electric Utility Cooperation for This Program

Since Energy Trust was first created to administer public purpose funds related to energy conservation and renewable energy generation, the Oregon Public Utility Commission (OPUC) has envisioned that Energy Trust's mission would cover both electricity and natural gas, though electric and gas laws and agreements are separate. Within two years of the launch of Energy Trust, the OPUC mediated a voluntary agreement with Oregon's largest natural gas utility, Northwest Natural, to direct the transfer of its public purpose funds for energy conservations programs to Energy Trust. Another Oregon gas utility, Cascade

Natural Gas, entered into a similar agreement in 2006. In effect, it has been an overarching policy goal of the state for a single entity to coordinate the cooperation between electric and gas energy conservation programs.

In terms of the extent that Energy Trust has accomplished the objectives of electric and gas cooperation for energy conservation programs, it believes it has worked very well. Energy Trust has continually met or exceeded ever-increasing annual goals for electricity and natural gas savings. Per the recent April 2013 [testimony](#) of the OPUC chair, Susan Ackerman, to the Oregon legislature:

...[the Energy Trust] has been tremendously successful in delivering cost-effective conservation at a very low cost to [electric and natural gas utility] ratepayers... [The Energy Trust] has met every target we've set for them over the past ten years. In short, they are doing what they've been tasked with doing. Because the [Energy Trust] runs programs for four utilities, it has the advantage of economies of scale, the benefits of a singular focus and can work with both gas and electric efficiencies in a single home [or businesses] in a way that individual utilities cannot.

Regulatory Issues

Targets for cost-effective acquisitions are determined through integrated resource plans. For those plans, Energy Trust provides estimates of the 20-year efficiency resource available by price and deployment curves for feasible rates of acquisition. These curves are built up from individual end-use sectors to create a composite. The utilities perform the analysis to compare cost and value to other resources. The PUC may choose to recognize the IRP. IRPs occur every two to three years.

Annually (about August), the Energy Trust and each utility gauge progress and prospects to decide how much funding is required to meet the IRP targets. If there are unique circumstances or special opportunities that would indicate a need or opportunity to deviate from the annual goals in the IRP, they are discussed at this point. Sometimes utilities choose to invest in additional conservation that is available based on time-dependent factors. Then, annually (September–December) Energy Trust sets one-year budgets and two-year acquisition plans by utility.

Utilities file for any needed rate adjustments to fund the programs on varying schedules. PUC reviews and approves. So far none have been rejected. An adjustment is not needed every year; in some cases, rate increases are planned to cover two years.

Rate revenue for electric comes from a fixed charge under SB1149 that can be set to meet IRP needs (see <http://energytrust.org/About/PDF/sb1149.pdf>) and a charge under SB838 (see <https://olis.leg.state.or.us/liz/2007R1/Downloads/MeasureDocument/SB838/Enrolled>). Gas funding comes through decoupling agreements and is rolled into gas rates. (See also Cascade stipulation pdf. The gas decoupling agreement with NW Natural that got ETO started on the gas business: <http://apps.puc.state.or.us/orders/2002ords/02-634.pdf>.)

Savings results are reported annually as part of Energy Trust’s annual report. They are then trued up as a result of evaluations that occur over the ensuing months and years. PUC gauges Energy Trust on its ability to meet goals on average over multiple years. Goals may be reset through the next IRP to reflect new information (updated load forecasts, new technologies, better understanding of efficiency markets, and so on)

The advantage of this process is that it adheres to IRP but provides the flexibility to be pragmatic about forward choices as new information becomes available. Utilities are least comfortable when a rate increase is required. However, with Oregon’s mandate for least-cost planning, the framework encourages conservation success.

Program performance: savings

	2011	2012	2013
Electric MWh ex post	129,998	134,553	147,430
Gas therms ex post	1,118,507	720,068	1,049,445
Budget	\$25.6 million	\$28.1 million	\$27.6 million

Savings are unadjusted from impact evaluation

http://energytrust.org/library/reports/PE_Impact_Eval_2009-11.pdf

Lessons Learned

Offering dual-fuel services is natural for customers. It is how they operate. In the long run, it is good for electric and gas customer relationships. Energy Trust’s experience is that customers trust utilities the most when they are acting in concert.

Industrial sites have huge and ongoing potential for cost-effective efficiency opportunities. While many industrial customers believe they have undertaken all possible efficiency at their sites, Energy Trust has not found this to be true. Advances in technology are providing new opportunities to save energy in manufacturing, and the SEM initiatives address these exciting changes.

SEM is a game-changer for industrial efficiency programs. SEM drives changes to help sites manage their energy use. Energy Trust achieves immediate savings through operational changes and enables greater participation with larger capital projects. Energy Trust PE has led the country in implementing SEM programs since 2009, delivering training and support to more than 70 industrial sites.

Customers will engage with a well-designed program. In some states, manufacturers have been exempt from public benefits programs in the belief they could be more successful on their own (self-direction). In Oregon, self-direction is on the decline as some large customers are opting to pay the public purpose charge to receive the services and incentives of the PE program.

The program priority must be to lower the first cost of projects. Industries typically make investment decisions on simple payback criteria or simple return on investment (ROI) and internal rate of return (IRR) calculations. Energy Trust's market research identified a target payback range of zero to six years at most sites. Incentives paid upon project completion have the biggest impact on investment decisions.

Additional customer support surfaces more cost-effective savings. PE is sales-based with a focus on developing long-term relationships to help customers achieve significant and ongoing savings. Customers recognize the value of program assistance in customer satisfaction surveys.

Targeting by sector may be off-target. Sectors help Energy Trust identify customers and target outreach to customer with high technical potential for savings. In Oregon, food processors and nurseries have strong professional associations with energy efficiency campaigns. But Energy Trust believes that manufacturers have more affinity by culture, than by sector, for example, lean manufacturers have more in common with each other than with less-creative organizations in their sector.

LARGE ENERGY USERS PROGRAM (LEUP), WISCONSIN FOCUS ON ENERGY

Program at a glance

Program name	Large Energy Users Program (LEUP)	
Targeted customer segment	Large energy users with electric loads that exceed 1 MW of power demand in any month and/or 100,000 therms in one month, or spend \$60,000 or more in one month in energy utility costs (electricity and natural gas). This group includes the largest industrial, healthcare, and office companies in Wisconsin, the largest municipal water and wastewater utilities in the state, and all four-year colleges, including the University of Wisconsin.	
Program start date	April 2012	
Annual energy savings achieved	Gas: 784,548 Dth (Gross tracked) Electricity: 114,474 MWh (Gross tracked)	
Number of program participants	2013	401
	2012	217
Peak demand (summer) savings achieved	14,687kW (Gross tracked)	
Budget for most recent year (and next budget cycle if available)	2013	\$11,637,923
	2014	\$13,500,000 (budget)
Funding sources	Focus on Energy: Statewide energy efficiency and renewable energy program funded by utility ratepayers	
Website	www.focusonenergy.com	
Contact for information:	Preston Schutt Public Service Commission of Wisconsin (608) 266-1462 Preston.Schutt@wisconsin.gov	

Program Overview

Beginning largely as an incentive program, supported by field-based energy advisors, the Focus on Energy Large Energy Users Program (LEUP) built upon this core service to provide technical expertise and new initiatives designed to reduce barriers to energy efficiency and renewable energy investment by Wisconsin's "large energy users."

Large energy users are customers with electric loads that exceed 1 MW of power demand in any month and/or 100,000 Therms in one month, or spend \$60,000 or more in one month in energy utility costs. This includes the largest industrial companies in the state, the largest healthcare and office facilities in the state, the largest municipal water and wastewater utilities in the state, and all four-year colleges, including the University of Wisconsin.

The program includes, on the electric side, efficiency measures such as lighting, motors/drives, compressed air, pumps, blowers, controls, filtration, refrigeration, aeration, vacuum, HVAC, information technology, process heating and cooling, and other manufacturing processes. On the natural gas side, the program targets steam systems, hot water, process heating, comfort heating, building shell, heat recovery, biomass, and biogas conversion. The program has also supported the commercialization of many emerging energy-efficient technologies over its duration, including specific technologies that help the pulp and paper, metal casting, plastics, and food processing industries.

The LEUP consists of a program director with four managers, including a field manager, an operations manager, an engineering manager, and a design manager. The field manager oversees 12 energy advisors who are located at various satellite offices across Wisconsin. These energy advisors are the front line in LEUP customer service. The other managers oversee staff activities such as marketing, engineering review of applications, data entry and incentive processing, the identification and design of new program offerings, administrative functions, and liaison activities with the program administrator, including meetings and reporting.

An expert energy advisor is assigned to each LEUP customer to provide direct service delivery. This delivery is supported by various business ally channels. The program relies extensively on collaboration with utility key account managers, key trade allies, and business associations that support program awareness, project development, and incentive delivery.

Teams are developed within each company, often consisting of an energy management champion, the facility engineer, an operations person, and a financial official, in order to establish awareness and ownership among the key stakeholders. Team meetings are approximately every two weeks to a month in order to establish continuity. The team is responsible for planning, scheduling, assigning task responsibilities, and reporting results for activities such as benchmarking and profiling energy use, project development, and project metering.

Customers have always played an important part in program design by informing the program of what barriers they face, both internal to their business and external, to how effectively the program delivers its services and incentives. LEUP continues to listen to customers to find ways to overcome remaining barriers to their participation.

In order to drive customer participation and additional savings, the Large Energy Users Program regularly advances special offers designed to break down critical barriers that large customers often face when trying to implement efficiency projects, such as lack of staff time and resources. These offers have included:

- Direct coordination of program services with a customer's utility key account manager. The energy advisor meets with the utility key account managers at least

- once per year to discuss their common customers and develop strategy. The EA and utility key account manager coordinate the contact and delivery of services to each customer, based on an agreed-upon approach.
- Energy management training and team support. Practical Energy Management (PEM®) training and facilitation to customers committing to energy management teams.
 - Strategic energy management. Advanced energy management support for companies with multiple facilities, including paper mills, food processors, and healthcare networks, offering benchmarking and key performance indicator development.
 - Incentive application development support (prescriptive and custom).
 - Third-party review of trade-ally proposals.
 - Special incentives, e.g., competitive incentive RFP for large projects and staffing grants. The competitive incentive RFP allows customers to provide feedback on the amount of money they need for large savings projects that may exceed the custom incentive limits such as payback, percent of project cost, or incentive cap. This RFP attracts the largest projects, and the incentive rate is usually lower than the custom incentive rate, making the initiative very cost effective.
 - Project assessment incentive (PAI) to provide reliable savings and cost estimates capable of launching a project. The PAI goes beyond a feasibility study, requiring more specificity in project design and project cost, typically from a vendor. The upfront agreement commits the customer to doing those identified projects that meet the company's financial threshold.
 - Market-targeted incentives, e.g., a bonus for multi-facility applied measures for healthcare networks.
 - Outreach materials and events, including best-practice training, practical energy management, and industry-targeted energy best practice.
 - Collaboration with CleanTech Partners, a nonprofit organization that advances emerging technologies and best practices, to offer "Shared Savings" financing for some customers.

An array of prescriptive (standard) incentives is offered for all Focus on Energy business customers. Each incentive is based on benefit-cost tests (program administrator cost test and TRC) conducted before the program year. Incentive applications frequently group eligible measures into common technology types, such as lighting or compressed air. The incentive is indicated on the application form. Customers or their vendors complete the application with numbers and types of equipment being replaced and accompany the application with invoices for work completed. Electric and natural gas incentives are handled in the same way.

Custom incentive applications, for projects that are more complex and application-specific, receive multiple levels of engineering review, both at implementer and program administrator levels. Specific assumptions and engineering calculations are applied to estimate energy savings and generate the incentive amount. The current electric incentive is \$0.04 per first-year kilowatt-hour and \$125 per kW; for gas, the incentive is \$0.80 per first-

year Therm. In order to preserve high program attribution, the program sets the upper payback limit at 10 years and the lower threshold at 1.5 years. The program will pay up to 50% of the project's cost. Projects are capped at \$200,000 and customers are capped at \$400,000 per year.

The program also strives to claim energy savings that accrue due to program intervention, but for which there was no incentive ("claim only"). In addition, LEUP will pay an incentive of \$0.20 per therm and \$0.02 per kWh for any project with less than a 1.5-year payback *if* it was identified by an energy advisor and was not known about by the customer.

Coordination/Integration of Gas and Electric Utility

Focus on Energy has its own brand, as do the various participating utilities. Utility key account managers, in their marketing, point to Focus on Energy as an adjunct to their services and include the Focus on Energy brand for much of their marketing. Except when asked for specific situations, such as providing a customer-specific training event in a particular utility service territory, Focus on Energy does not co-brand with the participating utilities.

Focus on Energy also generates monthly newsletters directed toward customers, utilities, and trade allies. The purpose of the utility newsletter is to inform utilities of Focus offerings, services, events, and so on. Additional marketing information is stored on the program administrator's utility-access SharePoint site. Some utilities include information on the Focus on Energy program on their individual utility websites for customers.

Focus on Energy combines participation by almost all electric and natural gas utilities in Wisconsin. One driving reason for this was to reduce confusion among customers and trade allies by providing common incentives and procedures across the state.

All utility territories are served with the same opportunities. Each utility watches program expenditures and reports if it does not believe it is getting its share of program dollars. The program tracks and often reports energy savings by gas and electric utility. The PA has a utility liaison, and meetings are held frequently to ensure program dollars are allocated fairly throughout the various utility service areas. The PSC also watches this as does the independent evaluator.

Motivations/Reasons That Led to Gas and Electric Utility Cooperation for This Program

Since the late 1970s, Wisconsin's investor-owned utilities operated demand-side management programs with regulatory oversight by the PSCW. In the 1990s, the Wisconsin Legislature, major utilities and the PSCW were investigating retail electric and natural gas competition among utilities. Energy efficiency and renewable-energy groups were concerned that utilities would abandon their efficiency programs if full retail competition was enacted. Therefore, the concept of one statewide, government-run energy efficiency and renewable energy program (Focus on Energy) was enacted. Some of the advantages of a single program included consistent incentive levels, only one program for trade allies and customers to navigate, and increased efficiencies in program delivery. The program has

changed over nearly 15 years of its existence. However most of the anticipated advantages have occurred as well as a few unanticipated benefits such as better customization of programs to fit customers and more innovative programs.

Regulatory Issues

There were two key regulatory challenges from the utilities’ perspective in the past. The first was compliance with existing statutes that required utilities to demonstrate, prior to receiving approval for construction of power plants or high-voltage transmission lines, that they had made reasonable efforts in demand-side management programs. Since utilities were no longer directly managing their own energy efficiency programs, legal arguments could be made that they were not complying with the existing statutes. The Wisconsin Legislature amended these statutes to better fit the realities of a single statewide program.

The other key issue was the fiscal management of a single program. Initially the program was a state-run program, so program funding was submitted to the state. Although the funds were in a segregated account, legislators began routinely diverting these ratepayer funds for other uses. Subsequently, Act 141 was passed and required the utilities to form a nonprofit organization (SEERA) and deposit the program funds in an account owned by SEERA. Since the program funds were no longer designated as state funds, the money could no longer be easily diverted to other uses. There were other notable changes in Act 141. One was to simplify the funding formula to 1.2% of utility revenues rather than the complicated formulas used previously. A second important change was to move program oversight to the Public Service Commission.

Program Performance

Except where indicated, program results provided are for the total program (combined utility territories).

Program spending actual (millions)			
	2011	2012	2013
Total			\$11.6
Gas			
Electric			

Program energy savings (gross tracked)		
Savings	2012 (Apr–Dec)	2013
Gas (Dth)	455,291	784,548
Electric (MWh)	76,282	114,474

Cost-effectiveness result

	2012
TRC	6.33

Lessons Learned

The LEUP implementer has learned many lessons about program design and delivery over its 13 years of Focus on Energy program experience. A common and consistent program across territories makes it easier for customers and trade allies to understand and participate in the program.

Internal coordination, where the customer works with one entity, is advantageous in terms of reducing confusion and making the process go faster.

The program needs to pay attention to customers to determine what program initiatives will most effectively address the customers' barriers. Understanding this lesson has generated sound program credibility and trust and is responsible for many of the current offerings, including the project assessment incentive and the competitive RFP.

Technical expertise and financial incentives make a powerful combination for effective program delivery.

Energy management support ensures long-term customer participation and savings.

Independent project assessments can generate significant energy efficiency resource acquisition if strategically administered, especially if they require that the customer follow up with projects that save energy.

In addition to direct delivery of services to customers, the program has learned over time the importance of recruiting and leveraging the support of key business allies. Coordination with key market players, including utility key account managers, business associations, trade allies, and externally-leveraged financial and technical support providers, such as the U.S. DOE, have been key to the program's success.

MULTIFAMILY PERFORMANCE PROGRAM, NYSERDA

Program at a glance

Program name	Multifamily Performance Program
Targeted customer segment	Multifamily buildings statewide with five or more units, new construction and existing buildings, market-rate and affordable projects are eligible
Program start date	2007
Annual energy savings achieved (2013)	Gas: 314,539 MMBtu Electricity: 32,120 Mwh
Number of program participants	February 2012 to 2014, 343 projects entered program, with 932 buildings and 54,319 units. During that period, 227 projects that entered the program prior to February 2012 completed construction. Those included 905 buildings and 35,817 units.
Peak demand (summer) savings achieved	51.8 kW (Note: This is only for EEPS-funded savings; NYSEDA does not track this number for savings associated with RGGI funds.)
Other measures of program results to date	Average whole-building savings achieved for projects that have completed the program and have at least one year of post-retrofit data is 23%. Average realization rate of predicted savings is 87%.
Spending for most recent year (2013)	\$12.9 million
Funding sources (name and description)	Gas: Energy Efficiency Portfolio Standard (EEPS) gas funding for firm gas customers. For oil or interruptible gas, customers get Regional Greenhouse Gas Initiative (RGGI) funding. Electric: Energy Efficiency Portfolio Standard (EEPS) electric funding.
Website	http://www.nyseda.ny.gov/Energy-Efficiency-and-Renewable-Programs/Multifamily-Performance-Program/Multifamily-Performance-Program.aspx

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Program Overview

NYSERDA's Multifamily Performance Program (MPP) is a whole-building, energy efficiency program that challenges multifamily building owners to reduce total source energy consumption by 15% or more. The program addresses buildings with five or more units and serves both the new construction and existing building sectors. Launched in 2007, the program consolidated several disparate multifamily-sector programs that had been run by NYSERDA since the late 1990s into a single point-of-entry for all multifamily building types. The program uses a standardized process, a straightforward incentive schedule based on building size, and a market-based approach to service delivery.

MPP requires that owners work with a qualified service provider to facilitate their program participation and provide them with the necessary technical assistance. Owners can select any service provider from NYSERDA's list of qualified Multifamily Performance Partners (Partners). Service providers can apply to become a Partner on a rolling basis. At this point, more than 100 providers throughout the state have been qualified.

Properties participating in MPP follow a three-stage process.

ASSESSMENT

Existing building component participants work with their selected Partner to benchmark the energy performance of their building and conduct an ASHRAE Level II audit that serves as the basis for an energy model. This model is utilized to identify cost-effective energy conservation measures (ECMs) that reduce the building's source energy consumption. The owner can choose which ECMs he or she would like to install as long as the overall work scope is cost-effective and meets or exceeds the program's savings target. All types of measures regardless of the type of energy they save (electricity, gas, oil, or other) are eligible.

New construction component participants must work with their Partner to choose one of two program options: the Performance Path or the Prescriptive Path. The Performance Path requires participants to work with their Partner to develop a customized energy model of the proposed building that shows at least a 15% energy cost reduction in comparison to a baseline model following ASHRAE 90.1-2007 Appendix G. Participants work with their Partner to choose the ECMs that will be incorporated into the design of their building to meet the savings requirements. All types of ECMs are eligible. The Prescriptive Path relies instead on a fixed set of ECMs and requirements that the Partner will help the participant incorporate into the building's design.

INSTALLATION

The owner works with his or her Partner to install the ECMs identified in the approved work scope. The Partner is not responsible for installing the measures but is responsible for ensuring that the installation is properly completed by the contractors of the owner’s choice. Before issuing incentives, NYSERDA conducts an independent inspection of the project to verify proper installation. Owners can choose to receive their full incentive at 100% construction completion, or they can receive half of it at 50% construction completion if they need assistance with cash flow.

Existing buildings incentives

Project type	Firm gas (per unit)	Nonfirm gas (per unit)
Affordable	\$1,000	\$800
Market rate	\$700	\$500

New construction incentives

Affordable performance (per unit)	Affordable prescriptive (per unit)	Market rate performance (per unit)	Market rate prescriptive (per unit)
\$1,200	\$900	\$900	\$675

MEASUREMENT

For existing buildings, one year after construction completion, the Partner submits the previous year’s energy bills to NYSERDA. Existing buildings that project at least a 20% energy reduction in the Energy Reduction Plan are eligible for an additional performance payment if they meet or exceed their project’s savings target. The percentage savings number for a project is based on source energy usage, which is the closest equivalent to energy cost in New York State. That means that electricity kWh usage is multiplied by 3.14 to account for distribution losses before those numbers are combined with gas or fuel usage to create the total pre- and post-retrofit energy usage number for the project.

Existing building performance payment incentives

Tier	Performance payment (per unit)
Tier #1	20%–22% \$150
Tier #2	23%–25% \$200
Tier #3	26%–28% \$250
Tier #4	29%+ \$300

MPP has evolved over time based on experience; however, the fundamental structure remains the same. Between 2007 and 2009, three updated versions of the program were released, resulting in process and technical documentation improvements. In 2009, the program’s source of ratepayer funding changed from the Systems Benefit Charge (SBC) to

the Energy Efficiency Portfolio Standard (EEPS), and the savings target was reduced from 20% to 15%. The most recent version of the program launched in July 2012.

Coordination/Integration of Gas and Electric Utility

MPP is predominantly funded with ratepayer funds awarded to NYSERDA through New York State's Public Service Commission (PSC). Prior to 2008, NYSERDA, rather than the state's investor-owned utilities, ran the majority of state ratepayer-funded clean energy programs. Beginning in 2008, the PSC encouraged both NYSERDA and the investor-owned utilities to present program design proposals. Since then, most sectors are served by both utility- and NYSERDA-run programs, coordinated where possible to serve different types of customers within the sector, but NYSERDA runs its ratepayer-funded programs autonomously from the utilities, with oversight from the PSC.

While both NYSERDA and the utilities run programs that serve the same sectors, the programs are not intended to be in direct competition with each other. For example, in the multifamily sector in NYC, Con Edison and National Grid run multifamily programs serving 5-75 unit buildings that provide rebates for predetermined lists of ECMs. Since NYSERDA's MPP serves all buildings with five or more units, buildings greater than 75 units can only participate in MPP, but smaller buildings have the option of choosing a comprehensive retrofit program (MPP) or they can participate in a utility program and receive rebates for one or more individual ECMs. The idea is that a comprehensive program may not be an ideal option for smaller buildings that cannot defray the costs of technical assistance over a larger project. The two types of programs give smaller buildings more options. NYSERDA is not intended to compete with the utilities for customers. The multiple programs are simply intended to provide customers with more options where more options were deemed to be necessary. However, in the next round of program design, the PSC is hoping to see NYSERDA collaborate with the utilities to collectively design and run programs that will more seamlessly serve customers and reduce confusion in the marketplace.

From 2007-2009, MPP was funded predominantly with Systems Benefit Charge (SBC) ratepayer funding. SBC funds were intended to fund market transformation programs that reduced electricity usage but also supported innovative strategies to encourage the adoption of energy efficiency measures, nurture demand for energy efficiency services, and develop the workforce and infrastructure necessary to provide those services. Another goal of SBC funds was to reduce the cost burden of energy bills for low-income customers. MPP was designed and launched in 2007 to contribute to the achievement of all of those goals in the multifamily marketplace. The broader market transformation focus of SBC allowed MPP to function as a whole building program, helping owners invest in the efficiency measures that made the most sense for their properties rather than restricting them to electric measures only. MPP was required to deliver electric savings that were cost-effective based on the program's total investment in projects, but as long as that requirement was met, the program was able to support energy audits and the installation of gas, oil, and other fuel-saving measures in addition to electric measures.

In 2008, the PSC deregulated SBC to apply the surcharge on both electric and gas services and allow utilities to participate in energy efficiency programs in New York State. The new funding stream was named the EEPS and the majority of NYSERDA's deployment programs, including MPP, were switched from being supported by SBC funds to the EEPS ratepayer funding stream. EEPS funds are intended to support resource acquisition and are attached to specific energy-savings goals. MPP has been predominantly funded through EEPS since 2009. There are EEPS electric funds and EEPS gas funds. EEPS rules require that electric funding only be applied to electric measures and gas funding only be applied to gas measures. In addition, EEPS funds are only available to customers who pay into the fund on their bill. In New York State, utilities have the ability to create interruptible gas accounts, supplemented with a nonregulated commodity when the customer is called upon. These gas accounts, called interruptible or nonfirm, do not pay into the fund. With the switch to EEPS from SBC, MPP was no longer able to use its main funding stream to support energy audits or fuel-saving ECMs for any of its customers other than firm-gas customers. In order to continue to provide a whole building program to the entire multifamily marketplace, including potential participants that were on interruptible gas rates or were oil customers, NYSERDA awarded MPP a small portion of the state's Regional Green House Gas Initiative (RGGI) proceeds. With a combination of RGGI and EEPS funding, the program has for the most part continued to operate as it was designed to in 2007.

The program implementation team must now assign funding on a measure-by-measure basis from the appropriate sources behind the scenes, and additional funding restrictions based on cost-effectiveness testing requirements must be dealt with. EEPS funding is restricted to measures that pass the Total Resource Cost (TRC) test, and program staff must ensure that there are enough measures meeting the TRC test to support the full incentive level for each project. If there are not enough measures that meet the TRC test, NYSERDA either supplements the incentive with RGGI funding or caps the eligible incentive at the cost of the measures that pass the TRC test. This makes the program more complicated to administer, but NYSERDA has tried to handle those complications behind the scenes in order to maintain a consistent and clear program design for the customer. Participants are still required to meet a straightforward 15% whole-building savings target, they are still able to choose whichever measures are the most cost-effective and practical for them to install in order to meet the target, and they still earn a flat \$/unit incentive for doing so, although in a few cases, NYSERDA has been required to reduce that \$/unit incentive when there were not enough measures included in the scope that met the TRC test requirements.

MPP is implemented by a combination of NYSERDA staff and contractors. NYSERDA has its own contracts, legal, marketing, and evaluation departments which provide those services for all of NYSERDA's deployment programs. In addition, each program has dedicated staff members that manage the implementation of their program and any contractors that support it. MPP is supported by three contractors: an implementation contractor (TRC Services) who collaborates with the internal NYSERDA team to run the program and manage projects, a quality assurance contractor (Taitem Engineering) who conducts on-going analysis on program performance and provides guidance and feedback on how to refine and improve the program and its implementation infrastructure, and a

marketing contractor (Brand Cool) that works with the MPP NYSERDA team and NYSERDA’s marketing department to promote the program.

Motivations/Reasons That Led to Gas and Electric Utility Cooperation for This Program

In New York State, the PSC collects all ratepayer funds from the utilities and determines how they will be utilized to increase the deployment of energy efficiency and renewable energy generation throughout the state. Up until 2008, those funds were exclusively given to NYSERDA to run clean energy deployment programs. Since 2008, the PSC has distributed funds to both NYSERDA and the utilities to run deployment programs. There is no need for utilities to cooperate with each other in order for NYSERDA to run a statewide program that offers incentives for both electric and fuel ECMs. The decision to combine different types of ratepayer funds lies solely with the PSC.

Regulatory Issues

Since 2009 when the PSC deregulated energy efficiency programs in New York State, allowing utilities to administer energy efficiency programs concurrently with NYSERDA, NYSERDA has worked collaboratively with utilities through regular meetings to coordinate utility and NYSERDA programs that serve the same sectors and to support program development and implementation. Coordination is challenging, and program overlap and inconsistent implementation issues are found throughout the EEPS portfolio of programs. As noted in the 2013 Moreland Commission’s report²³, this causes customer confusion, competing incentive levels, sector overlap, and inconstant savings reporting. The PSC is actively working to eliminate these issues and is currently working to establish a new portfolio that supports a customer centric and coordinated approach for the next round of funding that begins in 2016. Changes are to be determined.

Program performance

	2011	2012	2013
Program spending actual (most recent 3 years)			
Total			\$18.8 million
Electric			\$4.4 million
Gas			\$ 6.9 million
RGGI			\$7.5 million

²³ See the section on Competition of Program Administrators here:
<http://www.governor.ny.gov/assets/documents/MACfinalreportjune22.pdf>

Funding source	Gas savings reported (MMBtu)	Electric savings reported (kWh)
Electric	(2,494)	56,365,385
Gas	660,392	8,475,305
RGGI	406,832	5,221,699
Total	1,064,729	70,062,389

Impact evaluations are available here:

<http://www3.dps.ny.gov/W/PSCWeb.nsf/All/766A83DCE56ECA35852576DA006D79A7?OpenDocument>

Cost-Effectiveness Results

The PSC requires the TRC be used to screen cost effectiveness for EEPS eligibility. PSC defaulted the net to gross ratios for EEPS programs at .9. Until evaluation studies are finalized, all programs are operating at a .9 net to gross.

Lessons Learned

The ability to provide customers with a whole-building program that encourages them to take a strategic look at their building and develop a strategy for investing in efficiency that is based on their building's specific needs is a powerful tool.

Combining gas, electric, and other funding sources to support programs that give building owners the flexibility to take creative approaches to improving the efficiency of their buildings and complete comprehensive projects that are not restricted by the type of funding available supports market transformation by encouraging the type of action and decision making that owners will hopefully eventually do on their own in the absence of incentives.

Programs with combined funding sources can be more complicated to administer, but it is well worth the additional effort.

RETRO-COMMISSIONING, COMED IN PARTNERSHIP WITH NICOR GAS, PEOPLES GAS, AND NORTH SHORE GAS

Program at a Glance

Program name	Retro-Commissioning
Targeted customer segment	Retail/office buildings, commercial real estate, hospitals, education, hospitality, and other building types with more than 150,000 ft ² of air-conditioned floor space
Program start date	2008
Annual energy savings achieved	Gas: 65,285 Dths (net) Electricity: 17.6 GWh (net) June 1, 2012–May 31, 2013 (5th program year for ComEd, 2nd for gas utilities)
Number of program participants	Program year ending May 31, 2012: 50 completed projects Program year ending May 31, 2013: 49 completed projects
Budget for most recent year (and next budget cycle if available)	ComEd:\$2,004,008 (Program Year 5: June 1, 2012–May 31, 2013) Nicor Gas: \$1,561,000 North Shore Gas: N/A Peoples Gas: N/A ComEd:\$4.3 million (next budget cycle) Nicor Gas: N/A North Shore Gas: \$22,000 Peoples Gas: \$380,000
Funding sources	ComEd Smart Ideas is funded by customers in compliance with IL Public Act 95-0481 as an "Energy Efficiency Programs" line item on each customer bill. Nicor Gas Energy Efficiency Program is funded by Nicor Gas customers in compliance with the Illinois Public Utilities Act (220 IL CS 5/8-104). The Peoples Gas and North Shore Gas Natural Savings programs are funded by Peoples Gas and North Shore Gas customers in compliance with Public Act 96-0033.

 Websites

www.comed.com/rcx
www.NicorGasRebates.com/retro
www.peoplesgasdelivery.com
www.northshoregasdelivery.com

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Program Overview

In February 2008, the Illinois Commerce Commission approved ComEd's 2008–2010 Energy Efficiency and Demand Response Plan. The company was authorized to collect funds for the implementation of energy efficiency programs targeting residential and business customers through a rider on all bills. On June 1 of that year, ComEd launched Smart Ideas for Your Business (SIFYB), which offered incentives for standard (prescriptive) and custom energy efficiency projects.

Four retro-commissioning pilot projects were conducted during the first program year, establishing the basic program incentive structure still in place today. Customers receive a fully funded expert analysis of the performance of their building's energy-using systems conducted by an approved engineering firm. In return, they agree to spend at least a minimum amount on implementation of low- and no-cost operational improvements with a combined simple payback of 18 months or less.

Since that first year, several significant enhancements have been made to program strategy. Most importantly, a multiple service provider model was implemented beginning in Program Year 2. The engineering firms selected to be approved service providers act as the

primary sales channel for the program, typically generating over 80% of new projects in a given year. By paying for all engineering costs, ComEd allows service providers to offer an RCx study at no charge to qualified customers, which helps the providers strengthen their existing relationships with building management and generate new revenues. In turn, the program gains visibility and valuable access to decision makers at facilities which fit the program criteria.

A periodic RFP process is conducted to add new service providers and remove underperformers. In this way, the program not only gains access to additional customer decision makers, it also enables the recruitment of providers with strengths in specific market segments (hospitals, office buildings, hotels, educational facilities, and so on) Currently, there are 29 firms serving as approved RCx providers.

A second major strategic shift was the expansion of the program to include investigation for potential therm-saving opportunities. Partnering with the gas utilities in ComEd's territory has brought considerable value to the program; investigating for gas and electric savings simultaneously is far more efficient than doing so separately, which makes RCx more cost-effective for all parties. Further, it allows the utilities to address the energy efficiency needs of their customers in a more comprehensive manner.

Another important refinement has been to allow increased flexibility in project processes. For example, combining planning and investigation phases into a single process and single engineering report lowers costs and helps providers meet short customer timelines without sacrificing technical quality. Customer budget cycles also present frequent challenges; by being flexible with implementation schedules for specific measures, delays related to waiting for allocation of funds can sometimes be reduced.

These modifications have all contributed to the program's success. By the end of Program Year 6 (May 31, 2014), nearly 125 GWh and about 3.6 million therms in savings will have been generated by 190 completed RCx projects. While service providers continue to successfully recruit new participants, many of the ideal, easy-to-get RCx projects have been captured. For this reason, the program continually evolves to broaden its appeal, both in terms of customer flexibility and in types of buildings served.

In mid-2012, a monitoring-based commissioning option was introduced to give customers the opportunity to look for operational improvements on a longer-term ongoing basis. A one-time cash incentive is provided to help defray the cost of installing enhanced building automation software, and then participants are paid per kWh (and per therm, on a case-by-case basis) for verified savings that result from the project during a monitoring period of at least 18 months.

In 2013, the program began offering a new study at no cost to all buildings meeting RCx program eligibility guidelines. As opposed to the operational measures identified by RCx, this study searches for capital and retrofit opportunities for energy-saving improvements at customer facilities, and also provide analysis of available standard and custom incentives

and payback periods. Implemented improvements will lower the building's energy usage baseline, increasing the effectiveness of any ensuing RCx.

Coordination/Integration of Gas and Electric Utility

Since the first year that Illinois gas utilities collected funds on customer bills for energy efficiency (a 12-month period ending on May 31, 2012), ComEd has worked with Nicor Gas, Peoples Gas, and North Shore Gas to seek gas as well as electric savings where feasible on RCx projects. By that time, ComEd's program was in its fourth year, with a program implementer and an experienced network of service providers in place.

Rather than creating separate gas utility RCx programs, it was decided that simply expanding the scope of selected RCx projects to cover both gas and electric investigation was the best approach for generating therm savings. That way, ComEd's established program infrastructure could be leveraged to accomplish gas utility goals with minimal additional effort. Further, ComEd agreed to front the costs of expanding RCx projects to investigate for gas savings where appropriate in exchange for a lump reimbursement payment from the gas utilities for verified therm savings at the end of the program year. This payment would be made on a per-therm basis designed to cover the gas utilities' shares of both administrative costs and program incentives (service-provider fees).

In the next program year (PY5 for ComEd, PY2 for gas utilities), significant steps were taken to transition the overall RCx program to a more cooperative management approach. The gas utilities entered into their own contractual agreements with the program implementer, following the model used by ComEd in past program years. While ComEd continued to serve as program lead, the utilities worked cooperatively on branding and marketing. Program documentation and collateral included all the utility brands, and approval decisions were made jointly on content and format. Further, joint gas-electric projects required approval from the program managers of both utilities to move forward.

A new cost allocation strategy was also developed for PY5/2. For electric-only RCx projects, ComEd continued to pay 100% of all costs. For joint gas-electric projects, a cost allocation mechanism based on the ratio of benefits (measured as avoided costs) from past completed joint projects by each gas utility was put in place and updated as more information became available. This allowed each utility to pay its share of costs as they were incurred, rather than having to reconcile at the end of the program year. Program evaluation was performed by Navigant.

As the second year of this arrangement began in the summer of 2013, however, the gas utilities were faced with significant uncertainty related to future funding levels for their energy efficiency program portfolios, including RCx. This made the pay-as-you-go cost allocation model unworkable from a gas-utility planning perspective. To address these concerns while still working to act in the best interest of customers (in other words, to continue to look for gas savings where available and as funds permitted), the program is mostly reverting back to a ComEd-led and managed model. Branding, marketing, and program management will be done by ComEd, while the gas utilities' role will once again

be purchasing therms upon verification. Rather than ComEd covering the up-front costs of investigation for gas savings, however, the program implementer will pay those costs (through a discount to ComEd for joint projects) and then sell therms to the gas utilities. At the time of this writing, Peoples Gas and North Shore Gas have a purchasing agreement in place, while Nicor continues to evaluate its options.

Motivations/Reasons That Led to Gas and Electric Utility Cooperation for This Program

The case for offering RCx as a joint program rather than separate gas-only and electric-only versions is very strong. In the current program structure, investigating for gas savings opportunities in addition to electric adds only 10–15% to the total service-provider fee, and nothing to program administration costs; the utilities pay the program implementer the same per-project management fee whether the project is joint RCx or electric only. Further, many of the most commonly implemented improvements, such as scheduling measures, frequently generate both kWh and therm savings.

A joint approach is also optimal from the standpoint of customers. By conducting a single RCx instead of an electric-only project and a gas-only project, not only are overall program costs lower (ratepayer funds are used more cost-effectively), but the disruption of day-to-day business and demands on customer building staff can be minimized.

In terms of marketing and program development, a cooperative approach has many benefits. As the general message is the same—let us help you save money on your energy costs—a single, combined approach allows the partnering utilities to work together to gain customer access and trust rather than doing so separately. It also eliminates potential confusion that could be caused by the presence of two, rather than one, utility RCx programs in the marketplace.

In summary, the utilities have worked together effectively and have adapted their roles as dictated by changing circumstances.

Regulatory Issues

Illinois legislation requires the coordination of gas and electric energy efficiency programs in the state. 220 IL CS 5/8-104 directs natural gas utilities that submit energy efficiency plans and funding levels to meet the savings goals adopted by 220 IL CS 5 to “. . . (6) Demonstrate that a gas utility affiliated with an electric utility that is required to comply with Section 8-103 of this Act has integrated gas and electric efficiency measures into a single program that reduces program or participant costs and appropriately allocates costs to gas and electric ratepayers. The Department shall integrate all gas and electric programs it delivers in any such utilities' service territories, unless the Department can show that integration is not feasible or appropriate."

220 IL CS 5/8-104 instructed the Illinois Commerce Commission (ICC) to, no later than January 1, 2012 “develop and solicit public comment on a plan to foster statewide coordination and consistency between statutorily mandated natural gas and electric energy efficiency programs to reduce program or participant costs or to improve program

performance” and, no later than September 1, 2013, issue a report to the General Assembly containing its findings and recommendations.

The ICC’s report to the General Assembly indicated that commenters, in general, did not object to aspects of the ICC’s plan which included:

- 1) Continuing an Illinois EE Stakeholder Advisory Group (SAG) process in which interested stakeholders receive regular updates about utility program performance and provide feedback to the utilities about the programs.
- 2) Recommended continuing existing coordination efforts between the gas and electric utilities (Commonwealth Edison, Ameren Illinois Company, Nicor Gas, Peoples Gas Light and Coke and North Shore Gas, and the Department of Commerce and Economic Opportunity.
- 3) Recommended continuing coordination between Ameren’s gas EE programs and municipal electric and water programs which overlap its gas distribution system. In addition, the ICC’s report identified several challenges to gas/electric program coordination including “the need to allocate costs and potential conflicts-of-interest between the coordinating utilities and foreseeable differences between the utilities (for example, the use of differing metrics to evaluate vendors, differing expectations for reporting requirements, different approaches to marketing and communicating branded efforts, and different approaches to handling call center assistance).

In response to the ACEEE survey for this report, the utilities involved with the Retro-Commissioning program identified the following regulatory issues with program implementation:

- Alignment of program years is very important for program and project management and simplifies things greatly overall.
- The length/project life cycle of many RCx projects does not align well with the program year structure; in particular, costs associated with a given project sometimes are not incurred within the program year in which savings from that project are reported.
- Discrepancy in timing for plan submittals complicates planning for joint programs. For example, in 2013 ComEd’s planning for its next three-year plan was forced to incorporate many assumptions about the level of gas utility funding/involvement, as its plan submittal deadlines were on a different timetable.
- Evaluation results among the same group of projects between ComEd and gas utilities have varied (i.e., PY5 NTG of 0.71 for ComEd, 1.02 for gas utilities) by gas measures versus electric measures.

Program Performance

Except where indicated, program results provided are for the total program (combined utility territories).

Program spending actual (millions)

	June 1, 2010– May 31, 2011	June 1, 2011– May 31, 2012	June 1, 2012– May 31, 2013
Total	\$3.2	\$6.2	\$3.2
Gas	–	\$1.4	\$1.2
Electric	\$3.2	\$4.8	\$2.0

Program energy savings

	June 1, 2010– May 31, 2011	June 1, 2011– May 31, 2012	June 1, 2012– May 31, 2013
Gas (Dth)	–	114,330	65,285
Electric (GWh)	15.4	25.0	17.6

Savings indicated are net.

Cost-effectiveness result

Utility Cost Test (UCT)

ComEd June 1, 2010–May 31, 2011 0.50

ComEd June 1, 2011–May 31, 2012 0.80

ComEd June 1, 2012–May 31, 2013 TBD

Total Resource Cost test (TRC)

ComEd June 1, 2010–May 31, 2011 0.51

ComEd June 1, 2011–May 31, 2012 1.50

ComEd June 1, 2012–May 31, 2013 TBD

ComEd does not use the UCT test for programs; Illinois legislation relies solely on an adjusted TRC which has components of the societal test. UCT and TRC values were not available for the Peoples Gas or North Shore Gas programs. Many RCx projects in the Smart Ideas program span multiple program years, making it very difficult to attribute costs or savings to a single year for analytical purposes. During one program year (PY3), several compressed air pilot projects were evaluated as part of the RCx program; in other years, compressed air projects are not included in RCx program evaluation. The need to make multiple assumptions about measure persistence and various other factors also increases uncertainty in any calculations of program cost effectiveness.

Lessons Learned

ComEd conducting joint RCx with gas utility partners improves customer satisfaction and makes the process more cost-effective for all parties.

Adding investigation for gas savings to investigation for electric savings is a very low hurdle for experienced RCx service providers

Regular meetings between both utilities and the implementation contractor ensure that all parties are aligned with the program goals and messaging.

Open and frequent communication between utility program managers is needed. Both program managers should be in agreement on program direction and strategies and provide consistent direction to the implementer.

Early and ongoing assessment of vendor performance and regular review of key performance indicators is critical to identifying and correcting deficiencies. Key performance indicators should be tracked and reported among all involved parties (both utilities and implementer).

Gathering feedback from all sources – customers, service providers, program implementers, and evaluators – is critical to ongoing improvement in program processes and marketing strategy

Developing transparent and representative tracking reports provide the program managers with the data and insights needed to improve cost allocation models and program performance. Providing the same weekly data report to each utility program manager ensures transparency and consistency.

The greatest challenge unique to a joint program is balancing natural gas and electric goals, budgets, and objectives. For example, as the price of energy decreases so may a utility's available budget for the joint programs. One utility may want to ramp up a program's participation to balance their portfolio, but the other utility may not have the resources or available funding to support an expansion.

Technical factors can sometimes influence a program's ability to operate in a joint fashion. For example, ComEd's addition of a whole-building model approach for small-building RCx is not directly applicable to gas savings due to the absence of interval usage data for natural gas. While some gas savings can be captured through identification of electric-only operational measures, the approach must be justifiable as an electric-only initiative.

SMALL BUSINESS DIRECT INSTALL PROGRAM, LADWP/ SOUTHERN CALIFORNIA GAS**Program at a glance**

Program name	Small Business Direct Install Program
Targeted customer segment	Commercial: small business
Program start date	2012; formal program launch at customer sites was April 2013
Annual energy savings achieved	Gas: 11,519 Dths (projected) Electricity: 28.0 GWh (projected)
Number of program participants	April 2013 through March 2014: 8,075 sites assessed; projected total of 7,200 enrollments and 6,400 installations annually (once water/gas measures are included).
Other measures of program results to date	7,195 customers enrolled in program to date; lighting has been installed for 4,713 customers with a total project value of \$8,928,000 (April 2013 through February 2014). Average installed cost per customer is \$1,894.
Budget for most recent year (and next budget cycle if available)	Projected annual spending for 2013–2014 fiscal year is \$8,742,000 Budget for 2014–2015 fiscal year is \$20,000,000.
Funding sources	Gas: Ratepayer funding under the auspices of the California Public Utilities Commission Electric: Ratepayer funding under the authority of the City of Los Angeles and auspices of the California Energy Commission
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Program Overview

The state of California has set ambitious energy-savings goals to meet in the commercial sector by 2020. To achieve significant progress toward this goal, programmatic efforts must be more integrated, coordinated, and significantly scaled over the next few years.

To help achieve the ambitious energy goals and to help small businesses in the city of Los Angeles that are struggling to remain solvent in the current economic downturn, LADWP is implementing the Small Business Direct Install (SBDI) Program, a no-cost direct-install program that targets small business customers in the LADWP service territory. The program will target customers with a monthly demand under 30 kW in the first phase and then be expanded to include businesses using up to 100 kW or more of electric power. SBDI will assist these targeted nonresidential customers in reducing their energy costs, which will strengthen their revenue position, profitability, and ultimately increase the odds that they will prosper. Building owners and tenants are also provided with information on available incentives from LADWP and SoCalGas for more extensive retrofit measures. This program was newly created in 2012 and fully launched in April 2013.

Given their overlapping territories and the potential for reducing customers' natural gas usage in addition to electricity and water usage, the LADWP and SoCalGas decided to add this program to the list of jointly implemented programs to provide comprehensive services to small businesses, and to save on overall program costs. Under this combined effort, the program will be able to offer installation of measures and/or incentives for all three resource categories – electric, water, and gas savings. The program will also help reduce greenhouse gas emissions and increase local jobs.

The SBDI program incorporates the following measures at no cost to qualifying customers:

ELECTRICITY/LIGHTING MEASURES

- Lighting retrofits
 - T12 lamps/fixtures with magnetic ballast to T-8 lamps/fixtures with electronic ballast
 - Incandescent lamps medium base to CFL screw-in medium base
 - Halogen lamps med base to LED med base
- LED exit signs dual sided with battery backup

WATER/NATURAL GAS MEASURES

- Hot water pipe insulation (SoCalGas co-funded)
- Hot fluid tank insulation (SoCalGas co-funded)
- Faucet aerators
- Low-flow showerheads
- Low-flow kitchen prerinse spray nozzles (SoCalGas co-funded)

WATER-ONLY MEASURES

- Toilet flushometer adjustment/replacement
- Toilet replacement (tank-style only)
- Toilet leak detection test
- Half-flush handle installations
 1. Toilet
 2. Urinal (with diaphragm replacement as warranted)

SoCalGas will share the cost of delivering water/natural gas measures as indicated above, while LADWP will be solely responsible for the cost of electric- and water-only measures. As the lead utility, LADWP is utilizing both in-house resources and contractors to implement this program. Tasks include identification of potential participants of the program, facility assessments to determine appropriate measures to install, customer enrollment, installation of measures, administrative/processing, verification of installs, and program management tasks.

Customers receive installed measures free of charge. Customers who lease their business locations are eligible but must receive landlord permission.

The SBDI program was preceded at LADWP by a successful direct-install lighting program that was implemented by local contractors. That program, implemented between 2008 and 2010, was able to install free lighting up to a value of \$2,000 per business for over 44,000 local businesses. The current SBDI program offers a more robust selection of measures to businesses in need of efficiency upgrades.

Coordination/Integration of Gas and Electric Utility

Both utilities agreed up front that the utility leading the program will also take the lead in developing marketing materials and that both utilities' logos will be featured prominently. Each utility can market the program separately through its own marketing channels, and the cost of marketing is not shared unless both utilities agree that new joint materials need to be developed and co-funded.

LADWP is taking the lead for this program and is responsible for managing all aspects of day-to-day operations, including vendor management. LADWP consults with SoCalGas as necessary and provides monthly reporting. Implementation of the program involves multiple workforces, including LADWP program management staff and work crews in addition to consultant services.

The funding for SoCalGas comes from ratepayers under the auspices of the California Public Utilities Commission. The funding for LADWP, as is typical for POU, comes from local ratepayers and is under the direct authority of its board of commissioners and city council, overseen by the California Energy Commission. This difference in funding streams and regulatory authority have made it difficult for IOUs and POU to work together in the

past, which makes this partnership between SoCalGas and LADWP unique and with the potential to become a model in California.

In this program partnership, LADWP encumbers all program costs up front and invoices SoCalGas on a quarterly basis. SoCalGas will pay for the prearranged cost of installation of hot-water-reducing devices on a per unit basis and will also contribute 11% to the administrative cost of delivering the program.

The EM&V requirements for IOUs and POUs are very different (mostly due to the different funding sources and regulatory schemes); thus, each utility will be able to perform its own evaluations for the resource within its authority (LADWP for water and electric energy and SoCalGas for natural gas energy). Both parties will have access to relevant program data and agree to share the evaluation reports and findings with each other. Both utilities are committed to keep customer inconvenience to a minimum by sharing the results of on-site install verification activities that are being conducted by LADWP's energy efficiency field staff. LADWP has a separate EM&V study just beginning now, for which the consultant will coordinate with SoCalGas as appropriate.

Motivations/Reasons That Led to Gas and Electric Utility Cooperation for This Program

Both LADWP and SoCalGas had identified the value in partnering from early on and had attempted to partner over the years. But these partnerships were very limited in scale and were opportunistic in nature. In 2012, both utilities finally struck a master partnership agreement that authorizes the utilities to create joint programs under the umbrella agreement, thereby establishing standard procedures and criteria under which joint programs can be developed and implemented.

Several key events provided the initial incentive for a new, formal utility partnership between SoCalGas and LADWP. In 2005, new state legislation (SB 1037) required California POUs to make energy efficiency programs a priority before acquiring other sources of electricity or building new transmission lines. In addition, Assembly Bill 2021 (2006) required POUs to determine the energy efficiency potential within their service area and establish annual savings targets in order to achieve a statewide target of 10% reduction in energy use over ten years. In 2009, the CPUC directed California IOUs to develop partnerships with local governments and support their efforts to promote energy efficiency at the local level. In 2010, SoCalGas tried to partner with LADWP through other local organizations that were engaged in energy efficiency activities (including the Los Angeles Business Council and the Southern California Public Power Association); however, those efforts were unsuccessful due to their complexity and expense, especially as LADWP did not have a guaranteed funding source at that time. Another attempt was made to partner on the statewide Energy Upgrade California program in 2011, but LADWP's funding source – federal stimulus funds – added a level of complexity that made it unworkable.

In 2012, LADWP began implementation of a new, robust, and well-funded energy efficiency portfolio. The LADWP board of commissioners adopted an energy efficiency goal of 10% by 2020, along with a "stretch" target of 15%, and allocated \$128 million and \$139 million in FY

2012–2013 and 2013–2014, respectively, for energy efficiency programs. LADWP will complete an updated energy efficiency potential study in second quarter 2014 in order to determine the feasibility of adopting the 15% stretch target as a firm goal. To help achieve these new efficiency goals, and building upon previous efforts to partner, LADWP proposed a high-level formal partnership with SoCalGas that enables the utilities to partner on individual programs without having to revisit the terms and conditions of the overall agreement. LADWP realized that a well-structured partnership could not only help ramp up the new programs more quickly, it could also increase customer participation and ultimately energy savings. Furthermore, a partnership could build on the capacity of both organizations by enabling an exchange of information about best practices and technologies and provide access to a broader range of shared customers. With this joint program, LADWP is able to offer fairly comprehensive services to small businesses located in the city of Los Angeles, saving customers from having to contact both utilities separately for services. In addition, SoCalGas can utilize the direct-install method to reach small businesses without having to invest in the start-up cost or absorb the full cost of sending out installation crews. It is not cost effective for SoCalGas to send out installation crews to install gas-only measures for small businesses, so such an effort will not happen without a partner. Meanwhile, SoCalGas's contribution helps offset LADWP's administrative and implementation costs, making the program more cost-effective for LADWP.

Regulatory Issues

The California Long-Term Energy Efficiency Strategic Plan recognizes the integration of demand-side management (IDSM) options, including energy efficiency, demand response, and distributed generation, as fundamental to achieving California's strategic energy goals. To support this initiative, the IOUs have identified IDSM as a policy priority and have proposed a series of IDSM activities, pilots, and programs in their energy efficiency filings that will identify gaps, best practices, and improve efficiencies around delivery of programs in a comprehensive manner to customers. This activity supports the directive from the California Public Utilities Commission (CPUC) that the California IOUs develop partnerships with local governments to support their energy efficiency programs.

At the POU level, additional energy efficiency policies were developing in the same time frame. Senate Bill 1037 required POUs to make energy efficiency programs a priority and Assembly Bill 2021 directed each California POU to meet all achievable cost-effective energy efficiency measures by 2020, in an effort to reduce greenhouse gas emissions back to the 2009 levels with a statewide target of 10% energy reduction over ten years. In 2012, the LADWP board of commissioners adopted a goal of achieving 10% energy efficiency and a stretch target of 15% efficiency by 2020. The board allocated \$127 million for FY 2012–2013 and \$138 million for FY 2013–2014 for energy efficiency programs. The board also sought to create a balanced portfolio of energy-efficiency programs that will address all customers and market segments, as stated in the Energy Efficiency Guiding Principles that were adopted by the board (LABWPC 2012). For both SoCalGas and LADWP to meet their goals and directives, it became evident that a partnership between the two utilities to provide programs and services to the customers in their shared territory would be to each other's advantage. This partnership would allow LADWP to leverage existing SoCalGas programs,

allow both utilities to increase customer participation, and assist both in meeting their energy efficiency goals.

However, due to their differing regulatory and reporting structures, LADWP and SoCalGas continue to report on their efficiency programs separately, LADWP through the California Energy Commission (CEC) and SoCalGas through the CPUC. Programs are designed such that each utility works within its own structure and authorities. For example, in the SBDI program, SoCalGas did not have an approved work paper that would allow it to fund faucet aerators and showerheads, so LADWP is covering the full cost of installing these devices through its water conservation program. It is fortunate that the two utilities cover all three utility resource areas (electric, gas, water) to allow this to occur.

Due to the support of both regulators (the CPUC and CEC), it is anticipated that this model will grow further in California. One expected hurdle involves cost sharing between the utilities. Due to the different funding streams and regulatory structures, both utilities are expected to carefully track expenditures to make sure that each utility is responsible for its fair share of the program cost, including the labor incurred by internal staff. As this partnership is new, there is not much data to support the analysis of appropriate cost shares. Therefore, the two utilities have to rely on data from other cooperative efforts (such as between IOUs) and educated estimates of the incremental costs of implementing a program on behalf of the other utility. Both utilities agree to continually refine the cost-share methodology when more data become available. The utilities will conduct an annual review to determine if the existing cost split is still applicable for the year ahead.

Another challenge that arose in the development of the Master Inter-Utility Agreement was the restriction on entering agreements for a certain length of time. SoCalGas was restricted from committing funds to programs that extended beyond its current program cycle (which at the time was to end December 31, 2014). LADWP's board is restricted from entering agreements that go beyond three years in length. Over the past year, the CPUC has recognized the limitations of the previous two-year program horizons, especially since new programs may take longer than that to be fully implemented and provide enough data to understand their benefits and costs. LADWP plans to request permission to extend the partnership with SoCalGas from the city council to avoid early termination of successful programs.

Program Performance

As of February 2014, only electric measures had been installed. At the time of the joint program launch (April 2013), LADWP did not have staff with technical qualifications to install the gas measures. The LADWP team had to assign new staff and obtain appropriate licenses and qualifications, which delayed the start of the joint effort. This staff is now in place, and the full list of measures can be installed. The program has projected annual savings of 115,192 therms, 28,036,000 kWhs and 57,577,496 gallons of water.

Lessons Learned

The joint program has been operational for about nine months, and there are many areas that are working well, including the following.

Communications Both utilities have a single point-of-contact who helps manage and streamline communications between program staffs. The lead utility provides this for the customers – in this case LADWP – which represents both utilities to the customer. These single points-of-contact also help resolve any higher-level issues that affect multiple programs, thus maximizing efficiency and minimizing the amount of time program staff has to spend in troubleshooting and correcting issues.

Reporting The lead utility has been providing monthly reports on time, and having a single point-of-contact helps facilitate regular reporting.

Program Management LADWP leads the day-to-day management of the program, and SoCalGas has been very active and responsive in its support. The single management lead enables program decisions to be made faster.

The program is also still facing challenges. At the time of joint program launch, LADWP did not have staff with technical qualifications to install the gas measures. Consequently, the LADWP team had to assign new staff and obtain appropriate licenses and qualifications, which delayed the start of the joint effort. Currently, appropriate staff are on board, and the installation of water and gas measures is expected to begin in Q1 2014.

HOME ENERGY SQUAD, CENTERPOINT ENERGY/XCEL ENERGY**Program at a Glance**

Program name	Home Energy Squad
Targeted customer segment	Residential: primarily single-family
Program start date	2010
Annual energy savings achieved	Gas: 15,271 Dths Electricity: 3.6 GWh
Number of program participants	2013: 6,020 units 2012: 6,628 units
Peak demand (summer) savings achieved	1,503 kW
Other measures of program results to date	Since 2010, the Home Energy Squad has installed: Low-flow faucet aerators 15,000+ Low-flow showerheads 8,000+ Programmable thermostats 3,861 CFL lightbulbs 133,000 Multiple other measures, including door sweeps, water heater blankets, attic hatch and door weather-stripping, and so on.
Budget for most recent year	\$2.2 million
Funding sources	Both CenterPoint Energy and Xcel Energy recover program costs through the MN CIP Program (ratepayer-funded energy efficiency programs)
Website	www.homeenergysquad.net
Contact for information, gas: Todd Berreman Manager, CIP Implementation CenterPoint Energy (612) 321-4311 todd.berreman@centerpointenergy.com	
Contact for information, electric: Jean Hammer Product Portfolio Manager/Team Lead Xcel Energy (612) 330-5871 jean.m.hammer@xcelenergy.com	

Program Overview

The Home Energy Squad is offered in the Twin Cities metropolitan area as a partnership between CenterPoint Energy and Xcel Energy. The program is available to residential customers who have electric service from Xcel Energy and natural gas service from either CenterPoint Energy or Xcel Energy. This includes both Minneapolis and St. Paul and the majority of the surrounding metro area.

This program was designed with three underserved customer segments in mind: savvy household managers (interested in saving money), busy professionals (interested in saving time), and people with the interest but not the skill to make energy-efficient home improvements (interested in avoiding hassle).

The Home Energy Squad offers direct installation of high-efficiency measures in a single at-home visit performed by a two-member team of technicians. Two nonprofit vendors perform the at-home visits according to natural gas service territory: the Center for Energy and Environment (www.mncee.org) is assigned the CenterPoint Energy territory while the Neighborhood Energy Connection (www.thenec.org) serves the Xcel Energy natural gas footprint.

In the early years of the program, 2010 to 2012, Basic and Premium packages were offered. The Basic service included a list of available measures at a fee of \$50, while the Premium service included more measures and an \$80 fee. The fee covered the approximate cost of materials while the labor costs were covered by the utilities. Beyond the in-home visit and the expertise of the Squad technicians, the initial financial incentive was free installation labor.

In 2013, two significant changes were made to the pricing model. First the two-tiered offering was eliminated in favor of a single Home Energy Squad package covering all available measures at a fee of \$70. Once a customer signed up and the visit was underway, there was no reason to leave any available upgrades undone. Second, the value statement to the customer was revised. Instead of charging the customer a fee for materials with free labor, the fee is now described as a trip charge while the customer is offered a “suite” of materials and installation. The idea was to bring the stature of the Home Energy Squad program in line with other professional services. Many skilled trades charge a fee just to make a house call, and through the trip charge, the customer is encouraged to think of the Squad as an equivalent high-value service; however, unlike a plumber or electrician, the Home Energy Squad does not charge additional fees once the work begins. Rather, to fully exploit the power of the word “free,” all materials and labor are included in the cost of the visit at no additional charge.

Currently, the program focuses on measures that create substantial energy savings and can be installed quickly. Several end uses are targeted. Compact fluorescent light bulbs increase lighting efficiency. Exterior door and attic hatch weather-stripping improve the tightness of the building envelope and reduce heating and cooling energy. Water heating is addressed through three measures: energy-efficient showerheads and faucet aerators reduce hot water

usage; water heater blankets reduce standby losses; and water heater temperature correction improves both water heating efficiency and safety. Finally, programmable thermostats – perhaps the measure most responsible for driving participation – help to promote efficient heating and cooling usage patterns. The Home Energy Squad also offers a diagnostic option for \$30 that includes a blower door test. This is a prerequisite for CenterPoint Energy’s air sealing and insulation rebate, which is commonly recommended for qualifying homes. Other program materials referencing all of CenterPoint Energy and Xcel Energy rebate opportunities are also discussed with the homeowner during the visit. For example, the Squad crew takes note as to whether the customer has a Saver’s Switch attached to the central air conditioner; if not, then that program is explained and promoted to the customer.

After the visit is completed, the program vendor invoices each utility based on the electric and gas measures installed. The utility funding covers the difference between the \$70 trip charge paid by the customer and the actual cost of the service.

Coordination/Integration of Gas and Electric Utility

Customers want simplicity, so the utilities created a program name and logo that emphasized a team of helpful professionals and de-emphasized the complexities of the two-utility combined gas and electric delivery platform. The program was originally described as “Residential Quick Fix” and later branded as the “Home Energy Squad,” a brand name intended to evoke a superhero image: the Home Energy Squad, a team of energy experts equipped to help the customer reach his or her energy efficiency goals in one convenient visit.

CenterPoint Energy and Xcel Energy’s logos are also represented underneath the Home Energy Squad brand, which is the first time the two utilities have cobranded an energy efficiency program. Customers appreciate the collaboration shown by the two companies, which is very visible during their Home Energy Squad visit. All promotional material, forms and even the Home Energy Squad trucks are affixed with the cobranded emblem.

The Home Energy Squad has leveraged traditional print, broadcast and interactive marketing, and direct engagement via telemarketing and door knocking, and more recently, the program has launched several online discount campaigns through local newspapers’ websites. Costs are shared by the participating utilities.

The program is managed by both utilities and delivered by the Center for Energy and Environment and the Neighborhood Energy Connection. The two nonprofit vendors perform the at-home visits according to natural gas service territory: The Center for Energy and Environment is assigned the CenterPoint Energy territory while the Neighborhood Energy Connection serves the Xcel Energy natural gas footprint. The utilities oversee program implementation, marketing, and regulatory compliance, while the delivery vendors conduct the day-to-day business, including employing Squad technicians, procuring inventory, owning and maintaining the fleet, and completing visits and handling customer interactions. The utilities are invoiced directly by the program delivery vendors for their share of program delivery costs.

The Home Energy Squad's shared delivery model eliminates redundancies. A Squad van stocked with all available natural gas and electric measures serves each participating home, resulting in maximum natural gas and electric energy savings delivered to each customer by a single Squad crew in a single visit. This delivery model also allows cost sharing of combined gas and electric measures, like programmable thermostats. Marketing costs are also reduced with the shared delivery model.

Customers pay a flat \$70 fee (with an optional \$30 add-on blower-door test) for the Home Energy Squad visit. All remaining costs for the visit are borne by the utilities according to the type of energy savings (i.e., electric or gas) associated with the installed measure and recovered from ratepayers through the Conservation Improvement Program rate mechanism. For example, the material and labor cost of installing a compact fluorescent light would be paid for by the electric utility, while a water heater blanket would be covered by the electric or natural gas utility depending on the type of water heater. The cost of items that reduce both natural gas and electric use are shared by the electric and gas utilities.

There is currently no formal evaluation performed on the Home Energy Squad by a third party. Per the formal CIP filing, the contracted third-party program implementers are responsible for ensuring verification of measures.

Motivations/Reasons That Led to Gas and Electric Utility Cooperation for This Program

It was determined that most of the customers who participated in a home audit were not implementing some of the smaller energy efficiency measures. As a result, a program was originally conceived to take advantage of multiple simple conservation opportunities at home. Some of the possible measures would be difficult to deliver individually on a cost-effective basis, others would require some level of installation savvy. A solution began to take shape in the form of a program that bundled multiple energy-saving measures together with professional in-home installation. This single-visit approach would combine maximum energy savings and dependable installation, while simultaneously minimizing overhead costs. From that point, it was recognized that a combined natural gas and electric program would further exploit the benefits of the in-home delivery model. Also, anecdotal feedback from customers showed a need for a more collaborative approach when tackling energy efficiency projects. Customers found it frustrating to deal with two utilities that had different rules, approaches, schedules, and so on. By combining the service as an all-inclusive home visit, the customer spends half the time with twice the savings. CenterPoint Energy and Xcel Energy are the two largest utilities in Minnesota, and by forming a solid partnership, the two utilities are able to take advantage of increased opportunities by leveraging the strengths of each organization. The partnership has expanded to all other areas of energy efficiency space and all market segments are now reaping the benefits of a collaborative approach.

Regulatory Issues

CenterPoint Energy and Xcel Energy coordinate in designing the program for each Triennial Plan but file separately. While CenterPoint Energy submits a natural-gas-only program filing, Xcel Energy must account for its electric side of the program, which covers the entire Home Energy Squad footprint as well as a combined program for the portion of Squad territory served by both Xcel Energy electric and natural gas services.

Minnesota regulators at the Department of Commerce (Division of Energy Services – DER) were extremely supportive of a joint gas-electric program delivered by the two largest investor-owned utilities in the state. Several conversations were held with state regulators during the planning process to ensure the design was something that would be agreeable to them, as well as getting input for potential pitfalls during the regulatory process. The DER’s support for joint programs has increased during the past few years due to the success of the Home Energy Squad. This support enabled the utilities to move forward with additional joint programs in the commercial and industrial segment, as well as a joint rebate application process for residential furnaces with energy-efficient motors.

Program Performance

Note: Except where indicated, program results provided are for the total program (combined utility territories).

Program energy savings			
	2011	2012	2013
Gas (Dth)	11,493	12,718	17,318
Electric (MWh)	2,764	3,263	3,351

Savings indicated are gross.

Cost-effectiveness result

Utility Cost Test (UCT)

- CPE 2012 1.91
- XCL 2012 2.64 (gas)
- XCL 2012 4.36 (electric)

Societal test

- CPE 2012 1.71
- XCL 2012 3.26 (gas)
- XCL 2012 3.47 (electric)

Lessons Learned

After four years of program delivery, the team has learned that two utilities can effectively work together to deliver energy savings to their shared customers. Perhaps the greatest value to customers comes from the invisible mechanics of the Home Energy Squad’s

combined utility delivery platform. Customers benefit directly from the convenience of a single in-home visit, the low price of bulk-sourced materials, and the simplicity of a program that unifies gas and electric energy savings with professional direct installation.

The challenges of running such a program have been navigated solely by the delivery team, which includes marketing and energy efficiency delivery team members from CenterPoint and Xcel Energy, as well as the two delivery vendors, Center for Energy and Environment and the Neighborhood Energy Connection. Since launching in 2010, this delivery platform and the team behind it have been remarkably adaptable. Periodic meetings are held to discuss such topics as delivery efficiencies, marketing strategies, budget allocations, and future expansion plans. The team has formed a strong working relationship over the years. During the planning phase, it was difficult to get a consensus from so many groups representing different organizations. The technical review of measures also involved engineers from both utilities that had, at times, differing opinions on cost effectiveness, the viability of measures, equipment life, and so on. The teams would involve the engineers in team meetings when deemed necessary, and the two utilities would have to agree on a consistent delivery model. This was time consuming but ultimately established a good process for future technical review sessions. Determining marketing budgets was also rather difficult, but as the two utilities formed stronger working relationships, it became a very collaborative process. A reasonable cost split was established with both utilities holding the right to market “on their own” after receiving approval from its partner. Star Tribune Steals (similar to a Groupon) is one example that eventually became a strong joint-utility campaign.

From a branding perspective, customers wanted simplicity, so the utilities created a trademarked program name and logo that emphasized a team of helpful professionals and de-emphasized the complexities of the two-utility combined gas and electric delivery platform.

From a marketing perspective the utilities learned that customers are changing from year to year, so they have adapted the messaging to stay relevant. At first traditional print marketing and grassroots community events were effective at reaching customers interested in energy efficiency. Then the utilities shifted to direct engagement via telemarketing and door knocking to go after customers who were willing to participate but are less proactive. The utilities also created several online discount campaigns to entice customers who were interested in a good deal.

From a program design perspective, the utilities learned to use the flexibility of the delivery platform to accommodate different energy-saving measures and changing customer demand. In 2011, Xcel Energy determined that window weather-stripping was not a cost-effective measure for the program and CenterPoint Energy agreed, so the measure was removed. In 2012, water heater temperature setback services were added to capture additional energy savings. Finally, in 2013 the utilities added an optional blower-door test component to entice customers who value the direct-install piece but also want more

advanced diagnostics. The blower-door test is a component of the utilities' Home Energy Audit programs and is not directly a part of the Home Energy Squad filed costs.

The eternal challenges in running any conservation program are to remain relevant to the customer base, maximize cost effectiveness, and incorporate new technologies when available.

CALIFORNIA ADVANCED HOMES PROGRAM, SOUTHERN CALIFORNIA GAS, LADWP**Program at a Glance**

Program name	California Advanced Homes
Targeted customer segment	Residential new construction
Program start date	1990s (SoCalGas)
Annual energy savings achieved (2013)	Projected: 6,139 MWh and 143,767 therms
Number of program participants	40 committed projects
Peak demand (summer) savings achieved	2,068 kW (projected)
Spending for most recent year (2013)	Not yet operational for full program year yet
Funding sources	Gas: Ratepayer funding under the auspices of the California Public Utilities Commission Electric: Ratepayer funding under the auspices of the city of Los Angeles/California Energy Commission.
Contact for information, gas: Mark Drake Manager Southern California Gas (213) 244-4211 mdrake@semprautilities.com	
Contact for information, electric: Linda Martin Program Manager LADWP (213) 367-2312 Linda.Martin@ladwp.com	

Program Overview

The California Advanced Homes Program (CAHP) targets new home builders in SoCalGas and LADWP's overlapping territories. It offers financial incentives for all measures exceeding the California Title-24 building code. The 2013 financial incentives start at 15% above the building code, with incentives of \$75/kW, \$0.43/kWh, and \$1.72/therms saved and increases proportionally up to 45% above code with incentives of \$225 kW, \$1.29/kWh, and \$5.14/therm. In addition to financial incentives, the program also provides design assistance to builders.

CAHP is an existing program that the investor-owned utilities (IOUs), SoCalGas included, have offered perennially. This partnership marks the first time in California that a publicly

owned utility (POU) delivers this program in its territory. Previously, SoCalGas would pay electric incentives in LADWP's territory in addition to the gas incentives and claim the savings, but this practice was discontinued in 2011 per the CPUC's direction. The partnership allows sizable electric incentives to be offered to the customers, which helps in re-energizing the residential new construction market. The incentive structure corresponds to the statewide incentives, and accounting for that (and normal changes from year to year), the LADWP and previous incentives are the same.

Coordination/Integration of Gas and Electric Utility

Both utilities agreed upfront that the utility leading the program will also take the lead in developing marketing materials and that both utilities' logos will be featured prominently. The cost of developing these joint marketing materials is shared by the two utilities. Each utility can market the program separately through its marketing channels, and the cost of marketing is not shared unless new materials that both utilities develop jointly are needed. Marketing of the program relies primarily on one-to-one interactions vis-à-vis SoCalGas account managers working directly with individual builders. These account managers also attend trade shows and other builder events to promote the program.

SoCalGas is taking the lead for this program and is responsible for managing all aspects of day-to-day operations, including vendor management. SoCalGas consults with LADWP as necessary and provides monthly reporting.

With this joint program, LADWP does not need to develop a residential new construction program on its own and can instead leverage an existing brand that is already well known throughout the state of California. Since SoCalGas is already delivering the program in territories outside of LADWP's, there was very little or no additional staff needed, and instead, the existing staffing were readjusted accordingly to meet the staffing needs in LADWP's territory. There was no additional staff for LADWP either because an existing program manager has been assigned to multiple programs. This reduced the start-up costs significantly. With respect to SoCalGas, the addition of electric incentives will increase builder participation, as gas-only incentives may not be sufficient to attract the builders' interest.

The funding for SoCalGas comes from ratepayers under the auspices of the CPUC, and the funding for LADWP, as is typical for POUs, is under the auspices of the Los Angeles City Council and the California Energy Commission. Due to this difference in funding streams, IOUs and POUs have not worked together much in the past, which makes this partnership between SoCalGas and LADWP unique and potentially a model in California.

In this program partnership, SoCalGas encumbers all program costs up front and invoices LADWP on a quarterly basis. LADWP pays for the calculated amount of the electric incentives and 65% of program support costs, including SoCalGas's labor and vendor support going toward supporting the program in LADWP's territory.

The EM&V requirements for IOUs and POUs are very different (mostly due to the different funding streams). Thus each utility will be able to perform its own evaluation, but both parties agree to share the reports and findings with each other. Both utilities are committed to keep customer inconvenience to a minimum by conducting joint EM&V activities to the extent possible. In the past, each utility has had its own EM&V contractors. In all likelihood, the process evaluation will be done jointly, but impact evaluation will be done separately. SoCalGas does not have control over who the impact evaluator is because they will be appointed by the CPUC. LADWP is free to choose its own evaluators.

Motivations/Reasons That Led to Gas and Electric Utility Cooperation for This Program

Both SoCalGas and LADWP identified the value in partnering from early on and attempted to partner over the years, but these partnerships were very limited in scale and were opportunistic in nature. In 2012, both utilities finally struck a master partnership agreement that authorizes the utilities to create joint programs under the umbrella agreement.

Several key events provided the initial incentive for a new, formal utility partnership between SoCalGas and LADWP:

- In 2005, new state legislation (SB 1037) required California POUs to make energy efficiency programs a priority before acquiring other sources of electricity or building new transmission lines.
- In addition, Assembly Bill 2021 (2006) required POUs to determine the energy efficiency potential within their service area and establish annual savings targets in order to achieve a statewide target of 10% reduction in energy use over ten years.
- In 2009, the CPUC directed California IOUs to develop partnerships with local governments and support their efforts to promote energy efficiency at the local level.
- In 2010, SoCalGas tried to partner with LADWP through other local organizations (including the LA Business Council and the SoCal Public Power Association) that were engaged in energy efficiency; however, those efforts were unsuccessful due to their complexity and expense, especially as LADWP did not have a guaranteed funding source.

In 2012, LADWP began implementation of a new, robust, and well-funded energy efficiency portfolio. The LADWP board of commissioners adopted an energy efficiency goal of 10% by 2020, along with a “stretch” target of 15%, and allocated \$128 million and \$139 million in FY 2012–2013 and 2013–2014, respectively, for energy efficiency programs. LADWP updated its energy efficiency potential study in mid-2014 in order to determine the feasibility of adopting the 15% stretch target as a firm goal.

To help achieve these new efficiency goals, and building upon previous efforts to partner, LADWP proposed a high-level formal partnership with SoCalGas, that enables the utilities to partner on individual programs without having to revisit the terms and conditions of the overall agreement. LADWP realized that a well-structured partnership could not only help ramp the new programs up more quickly, it could also increase customer participation and ultimately energy savings. Furthermore, a partnership could build the capacity of both

organizations by enabling an exchange of information about best practices and technologies. While there are no quantified metrics for the ramp-up time of a new program, one year of development is not unusual, judging from a program recently launched by LADWP. The two utilities worked out the joint CAHP program parameters in substantially less time, four months or so.

Regulatory Issues

The California Long-Term Energy Efficiency Strategic Plan recognizes the integration of demand-side management (IDSM) options, including energy efficiency, demand response, and distributed generation, as fundamental to achieving California's strategic energy goals. The strategic plan described the IDSM vision as:

Energy efficiency, energy conservation, demand response, advanced metering, and distributed generation technologies are offered as elements of an integrated solution that supports energy and carbon reduction goals immediately, and eventually water and other resource conservation goals in the future.

To support this initiative, the IOUs have identified IDSM as a policy priority and have proposed a series of IDSM activities, pilots, and programs in their energy efficiency filings that will identify gaps, best practices, and improve efficiencies around delivery of programs in a comprehensive manner to customers. This activity supports the directive from the CPUC that the California IOUs develop partnerships with local governments to support their energy efficiency programs.

At the POU level, additional energy efficiency activities were developing. Senate Bill 1037, which was enacted in 2005, required POUs to make energy efficiency programs a priority and Assembly Bill 2021 directed each California POU to meet all achievable cost-effective energy efficiency measures by 2020 in an effort to reduce greenhouse gas emissions back to the 2009 levels with a statewide target of 10% energy reduction over ten years. While there were energy efficiency activities on the POU side prior to this bill, the legislation helped promote their importance within the utility's energy portfolio. In 2012, the LADWP board of commissioners adopted a goal of achieving 10% energy efficiency, and a stretch target of 15% efficiency, by 2020. The board allocated \$127 million for FY 2012–2013 and \$138 million for FY 2013–2014 for energy efficiency programs. The board also sought to create a balanced portfolio of energy-efficiency programs that will address all customers and market segments.

For both SoCalGas and LADWP to meet their goals and directives, it became evident that a partnership between the two utilities to provide programs and services to the customers in their shared territory would be to each other's advantage. This partnership would allow LADWP to leverage existing SoCalGas programs, allow both utilities to increase customer participation, and assist both in meeting their energy efficiency goals.

Due to the support of both regulators (the CPUC and CEC), it is anticipated that this model will grow further in California. The CPUC has included in its decision for energy efficiency programs in 2012 a call for California IOUs to work more closely with POUs. One expected hurdle is regarding cost sharing. Due to the different funding streams, both utilities are expected to carefully track expenditure to make sure that each utility is responsible for its fair share of the program cost, including the labor incurred by its own staff. As this partnership is new, there is not much data to support the analysis of appropriate cost shares. Therefore, the two utilities have to rely on data from other cooperation efforts (such as between IOUs), but both utilities agree to continually refine the cost-share methodology when more data become available. The utilities will conduct an annual review to determine if the existing cost split is still applicable for the year ahead.

Program Performance

The annual budget for SoCalGas is \$1,000,000 and LADWP's annual budget is \$2,500,000. Since the program has been in operation for less than a year, no projects have been completed at the time of this writing. As of December 31, 2013, there were 40 committed projects, with a total projected savings of 2,068 kW, 6,139 MWh, and 143,767 therms. This program is not cost-effective in California due to the mild climate. It has not been cost-effective for many years, but it is strategically and politically very important. Therefore, cost effectiveness is not the most important consideration in the design and implementation of this particular program.

Lessons Learned

The joint program has been operational for nine months as of this writing, and there are many areas that are working well, including the following.

Communications. Both utilities have a single point-of-contact dedicated to this partnership effort who helps manage and streamline communications between the utilities' program staffs. These key people also help resolve any higher-level issues that affect multiple programs which the two utilities partner on, thus maximizing efficiency and minimizing the amount of time program staff has to spend in troubleshooting and correcting issues.

Reporting. The lead utility has been providing monthly progress reports and program data to the supporting utility on time, and having a single point-of-contact helps facilitate regular reporting.

Program performance. By leveraging an existing California brand, both utilities managed to gain ground fast, as builders are accustomed to and comfortable working with the California Advanced Homes Program.

Program management. LADWP has been very active and responsive in supporting the program but has also entrusted the day-to-day management to SoCalGas in full, therefore enabling program decisions to be made faster.

The program also still faces challenges:

Invoicing. Utilities are not used to the practice of invoicing other utilities. Creating a system and process to invoice LADWP is a barrier that SoCalGas is addressing. The amount of time and effort required has exceeded initial estimates, but SoCalGas is continuing its effort to create an efficient process to invoice the partner utility.

Coordinating marketing and outreach efforts. Since both utilities are more accustomed to working on their own, coordinating marketing and outreach efforts can be a challenge and requires a significant amount of personnel time to manage the communications.

EFFICIENCY VERMONT AND VERMONT GAS RESIDENTIAL NEW CONSTRUCTION PROGRAM**Program at a glance**

Program name	Efficiency Vermont and Vermont Gas Residential New Construction Program
Targeted customer segment	Residential: Targets developers, builders, and homeowners of single family and multifamily residential new construction and gut rehab projects.
Program start date	2001
Annual energy savings achieved (2012)	Gas: 11,768 Dths Electricity (net): 1.6 GWh
Number of program participants	Vermont Gas Systems: 2012 56 customers/554 units 2011 85 customers/285 units Statewide totals: 2012 1,043 2011 789
Budget for most recent year	Vermont Gas Systems: \$0.86 million Efficiency Vermont: \$2.5 million
Funding sources	Vermont Gas Systems: Recovered from rates after regulatory approval Efficiency Vermont: Energy efficiency charge on electric bills
Website	Vermont Gas Systems: http://www.vermontgas.com/efficiency_programs/res_programs.html Efficiency Vermont: http://www.encyvermont.com/for-our-partners/Residential-New-Construction-Partners/General-Info/Overview

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Program Overview

Efficiency Vermont's (EVT) and Vermont Gas System's (VGS's) residential new construction (RNC) service provides comprehensive energy efficiency services to customers building or gut rehabbing new single and multifamily homes in Vermont. This cosponsored new construction service has been provided since 2001. VGS has had an RNC service in place since 1993.

Enrollees are primarily building contractors but also can be individual homeowners. The RNC service promotes cost-effective energy efficiency measures that result in homes that are affordable to operate, comfortable to live in, and durable over time. EVT and VGS staff work closely with enrollees to consider options for deeper savings during the planning stages of new projects. Collaboration with marketplace partners to support education and outreach efforts is critical as the service seeks to meet its goals of reaching 40% market share for single-family homes by the end of 2014 and the stated goal of net-zero new construction by 2030.

The RNC service has adapted over the years to account for new technologies, changes to the ENERGY STAR guidelines, and changes to the building energy codes in Vermont. The core RNC service remains Vermont ENERGY STAR homes, which builds on the national ENERGY STAR homes criteria by requiring higher levels of insulation and air sealing in addition to ENERGY STAR lights, appliances, and HVAC equipment. The Environmental Protection Agency recognized EVT and VGS with the 2011 and 2012 Partner of the Year award in the *Energy Efficient Program Delivery* category.

In 2011, RNC services expanded to include an Energy Code Plus tier designed to engage builders wishing to exceed Vermont's new energy code but who were not interested in pursuing the expanded ENERGY STAR V.3 criteria. This has proven an effective means of maintaining market share in a time when both energy codes and ENERGY STAR specifications are changing. The average Home Energy Rating System (HERS) Index on

single-family homes completed in the program improved by nine index points from 2008–2013, from 60 to 51.²⁴

The RNC service now includes a High Performance Home tier, with projects achieving 70% energy reduction over Vermont’s baseline home. Noteworthy projects include the nation’s first Habitat for Humanity home to receive Passive House certification and a high-performance mobile home replacement program launched in 2013.

EVT and VGS provide personalized technical assistance from the planning stages of a project through construction. An energy rating is performed on every home to assess overall efficiency and show compliance with the performance requirements of Vermont’s energy code. At the beginning of each project, staff determine what the enrollee’s goals are and use that information to inform how they can best work with each customer.

All services, including the energy rating, are provided at no cost to the program enrollee, and VGS helps cover a portion of the service delivery costs for projects in its service territory. Homes that successfully complete the RNC program (single family) receive incentives, including:

- Financial incentives up to \$1,700 (VGS pays up to \$650)
- Home Energy Rating Certificate (The multifamily program offers an incentive of \$750/unit for ENERGY STAR projects rather than the HERS index incentive)
- Residential Building Energy Standards (energy code) certificate
- ENERGY STAR label (if applicable)
- Verification of \$2,000 EPACT tax credit eligibility. (EPACT tax credit for new homes expired December 31, 2013)

Additional incentives are available from VGS for thermal saving measures (like drain water heat recovery for single and multifamily projects), and EVT offers additional incentives on single-family homes for electric customers in its territory.

EVT recovers program costs through an energy efficiency charge on customers’ electric bills and VGS recovers program costs from rates after regulatory approval. EVT’s RNC goals are based on kilowatt hour savings. However, the program cost effectiveness is assessed through the total resource cost methodology, so fossil fuel, water, and operation and maintenance savings are also accounted for. VGS focuses on savings per thousand cubic feet of gas (Mcf) that are incented accordingly.

²⁴ A lower number on the HERS index indicates a more energy-efficient home. To put this in perspective, a typical existing home is 130, and an average newly constructed single-family home will have an HERS rating of 100.

EVT and EGS have demonstrated a long-term commitment to the new-home construction industry in Vermont. The organizations are committed to working with builders and homeowners to find the most efficient solutions for all and are continually implementing new support structures and looking to the future to best meet the energy efficiency needs of residential buildings. By leveraging their role as trusted third-party voices, EVT and VGS work in partnership with contractors and homeowners to meet their efficiency goals while driving market transformation towards net-zero construction practices.

Coordination/Integration of Gas and Electric Utility

EVT and VGS have overlapping service areas, primarily in the northwestern region of Vermont. EVT provides electric efficiency services, and VGS provides natural gas efficiency services.

In the overlapping service areas, the RNC program is cobranded, using EVT and VGS logos on marketing materials. Marketing materials are primarily developed by EVT's marketing team with input from VGS. Both organizations use these materials to promote the RNC program to their customers. VGS has a summary overview of the program on its website which references the EVT website for more program details and enrollment information.

Marketing for the RNC program encompasses various media sources and partnerships. Many enrollments come from repeat builders in the program and word of mouth from past program participants. VGS markets the service directly to builders at the time of their application for natural gas service. VGS provides leads to EVT's lead intake coordinator on new homes being built. This is accomplished through a weekly report that contains all new sign ups in VGS service territory and allows for follow-up directly with new homeowners or builders to encourage participation. Both EVT and VGS reach out to builders and new homeowners with brochures and through social media, home shows, and publications targeted at individuals who may be building a new home. Projects in VGS territory account for approximately one-third of total projects in Vermont. Outside of VGS territory, EVT obtains leads through electric utilities, land-use permits, home shows/marketing, and repeat builders.

EVT serves as program implementer and primary project contact for customers. EVT staff work with customers throughout the project from design phase through project completion. All projects receive technical assistance and an energy rating. VGS pays EVT a set amount per successful project that helps cover a portion of the administrative and marketing costs. In doing so, it allows more cost-effective program delivery without overlap.

EVT staff process energy rating documents and determine appropriate incentive levels and then provide that information to VGS, which pays its share of incentives directly to the customer (and EVT pays its share directly to the customer). The structure of cost-sharing incentives is also a benefit to both organizations as it allows VGS and EVT to provide direct incentives to their customers in a coordinated manner. As VGS territory increases in scope within Vermont, the current structure will allow the expansion to happen with little need for program modification.

EVT realizes savings through services provided to electric customers, while VGS realizes thermal savings for services provided to natural gas customers. EVT claims electric savings for installed measures (i.e., lights and appliances) as well as shell measures (i.e., heating and air conditioning) as determined through a user-defined reference home analysis using energy rating software. A tight, well-insulated shell will result in savings from decreased energy use for space heating and cooling. VGS claims savings only on installed thermal measures.

Both utilities are overseen by the Vermont Public Service Department.

Motivations/Reasons That Led to Gas and Electric Utility Cooperation for This Program

VGS and EVT agreed to join forces in 2001 to adopt this model for ease of delivery for both entities and joint customers.

In the provision of RNC services, it quickly became apparent that a comprehensive, customer-centric approach demanded a high level of cooperation between efficiency programs across fuel types. This conclusion was reached for two reasons. First, treatment of a building as a system would be impossible unless the total energy use of the building was being considered. Second, customers and contractors busy with the variety of tasks related to new construction should not be asked to navigate between two separate utility efficiency programs for the same project.

Inter-utility cooperation also helped to provide a coordinated approach for customer outreach and messaging. By working together to offer a joint program, EVT and VGS were able to effectively combine their resources to achieve a higher level of outreach to potential customers. Importantly, working together enabled this messaging (and the underlying program design, incentives, and so on) to be consistent, regardless of which utility was conveying it.

This coordinated approach has enabled the joint program to achieve a high level of market penetration that might not have been possible had EVT and VGS been marketing separate programs. In 2013, approximately one-third of total program completions in the state of Vermont were in VGS territory.

Although the RNC program was the result of a mutual agreement, Vermont legislation, 30 V.S.A. § 235, passed in 2007 required the creation of heating and process fuel efficiency programs that

- (1) produce whole building and process heat efficiency, regardless of the fuel type used;
- (2) facilitate appropriate fuel switching; and
- (3) promote coordination, to the fullest practical extent, with the electric efficiency programs established and administered pursuant to this chapter, as well as with low income weatherization programs and any utility energy efficiency programs.

Regulatory Issues

EVT and VGS are both separately responsible for their own regulatory filings. Joint filings are not made for joint programs such as this one. Metrics such as costs and savings are noted separately, with each entity reporting on the savings that are attributable to its program (i.e., kilowatt hours for EVT and therms for VGS). That said, both utilities do reference their joint programs generally in filings such as annual reports and annual plans.

Issues of regulatory coordination and problem solving are mostly addressed informally through discussions amongst EVT, VGS, and the Vermont Public Service Department, which performs the function of ratepayer advocate. This approach helps to ensure that any problems or issues that arise can be addressed efficiently without having to engage in expensive, formal regulatory processes.

Program Performance

Except where indicated, program results provided are for the total program (combined utility territories).

Program spending actual (millions)

	2010	2011	2012
Total	\$2.41	\$2.51	\$2.91
Gas	\$0.38	\$0.51	\$0.86
Electric	\$2.30	\$2.00	\$2.50

Program energy savings

	2010	2011	2012
Gas (Dth)	5,466	6,902	11,768
Electric (GWh)	1.4	1.4	1.6

Cost-effectiveness result

Benefit cost ¹	2010	2011	2012
VGS	5.01	4.71	4.72
EVT	3.32	3.94	2.71

¹ B/C ratio = total program benefits/(costs*0.90). Total program benefits divided by 90% of the costs as directed by Vt. Public Service Board via the avoided cost screening model (see <http://psb.vermont.gov/sites/psb/files/orders/2013/2013-12/Order%20re%20avoided%20costs.pdf>)

Lessons Learned

The success of the VGS/EVT partnership is due in large part to the coordinated approach the two entities have taken to promote the RNC service. As with any endeavor, clear roles and responsibilities are essential. VGS and EVT have always tried to align services so that they are the same for customers within – and outside of – VGS territory. VGS promotes the

service to its customers and shares in the program delivery costs. EVT serves as the primary program implementer in order to ensure consistent service for all customers. In doing so, builders can expect the same customer experience whether they are working in VGS territory or not. This consistency is appealing for builder partners who manage multiple projects across the state.

It is also important to maintain good communication to ensure that the partners are getting the information they need to deliver the program successfully. VGS raises awareness of the RNC program and provides EVT with information on potential new projects for follow-up. EVT provides monthly participation reports to VGS, which uses that information to claim savings and determine the cost-sharing amount paid to EVT for service delivery. EVT and VGS consult on any significant changes in program design or incentives.

EFFICIENCYCRAFTED NEW HOMES PROGRAM, AEP OHIO/COLUMBIA GAS OF OHIO

Program at a glance

Program name	EfficiencyCrafted New Homes
Targeted customer segment	Builders and buyers of residential new construction as defined by the EPA ENERGY STAR New Homes program and RESNET standards, including single-family and multifamily, gut rehab, and site assembled modular
Program start date	Launched September 2010. First completions January 2011.
Annual energy savings achieved	Gas: 8,450 MCF Electricity: 6,798 MWh
Number of program participants	2013 2,552 homes 2012 1,790 homes
Peak demand (summer) savings achieved	3.7 MW (not adjusted for coincident peak)
Other measures of program results to date	Homes, program to date: 5,242 Participating builders: 85 Participating raters: 22 Training sessions/attendees: 73/673 Market share (Columbia Gas): 40% (certified homes, all those completed in the program vs. all new home meters) Market share (AEP Ohio): 24% (certified homes, all those completed in the program vs. all new home meters)
Budget for most recent year (and next budget cycle if available)	2013 \$6.3 million 2014 \$4.2 million
Funding sources	Columbia Gas of Ohio recovers expenses for the program through a DSM rider paid by Columbia Gas of Ohio customers. AEP Ohio collects program costs through a rider on AEP customer residential electric bills.
Website	www.columbiagasohio.com/residential/save-energy-money!/efficiency-crafted-homes www.aepohio.com/ESNH

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Program Overview

The AEP Ohio and Columbia Gas of Ohio ENERGY STAR New Homes program was launched September 2010 as a collaboration between the two major utility companies serving the cities of Columbus, Toledo, and Canton and approximately 70% of counties in the state – the first program in their respective efficiency portfolios to be delivered jointly as one initiative in overlapping territories (the program is operated as a stand-alone program by each utility in nonoverlapping areas) and the first time that comprehensive support was being offered for energy efficient new home construction in this market.

At the time of inception, the program aimed to address a number of market barriers, including:

- First cost continuing to drive a significant proportion of builders to construct (and customers to buy) homes that are code minimum compliant
- Builders lacking reliable information on the best approaches to cost effectively achieve high-efficiency levels
- Homebuyers lacking information about energy efficient construction and unsure of the credibility of energy efficiency claims
- Homebuyers who may have been unable to secure financing for higher efficiency levels in new homes
- Builders unsure of the potential to recoup the cost of upgrades in the sale price

Additionally, challenges both real and perceived in preparing for the transition to ENERGY STAR version 3.0 were placing continued market-driven adoption of ENERGY STAR certification and energy efficient construction practices at risk.

Over the subsequent three years, participating builders have been supported by an extensive package of incentives, training, quality assurance, consumer marketing materials, recognition, public relations, and media events. Technical requirements and incentives were originally linked to the three ENERGY STAR versions operating through 2011 (2.0, 2.5, and

3.0) and were designed to support the transition to full version 3.0 by builders and their subcontractors.

In 2012, the program introduced an additional strategy to promote energy performance by linking incentives and marketing messages to energy ratings – higher incentives for lower HERS scores according to a graduated scale. A two-tier structure was retained in order to promote ENERGY STAR (version 3.0) compliance at a higher incentive level while retaining an “entry level” tier based on the program’s previous version-2.0-based technical requirements.

In 2013, the structure and requirements were retained, while the specific HERS thresholds and incentive amounts were adjusted to reflect the introduction of a new (IECC 2009 based) state energy code and allow more homes to participate within available budgets. The 2013 incentive structure for single-family homes appears below.

The program is aimed at builders of single-family, single-family attached (“multisingle”), and multifamily residential units meeting the definitions and requirements of the RESNET Home Energy Rating System and ENERGY STAR Certified Homes Program, as applicable (generally new or gut rehab residential structures up to three floors). Incentives are adjusted for multisingle and multifamily units (75% and 50% of the single-family incentives, respectively) to reflect the proportionally lower savings available in these configurations.

A number of additional technical requirements have been enforced at both program levels in order to boost savings for each fuel and to address building science best practices (such as mechanical ventilation). Since incentives are linked to HERS scores for both tiers, specific additional requirements at the ENERGY STAR level (including ENERGY STAR qualified heating and cooling equipment) also provide some incremental energy savings to help offset the additional incentive at this level (specific measures shown below).

ALL HOMES

- Maximum 5.0 ACH50 building envelope air leakage
- ENERGY STAR qualified compact fluorescent lights (CFLs), light-emitting diodes (LEDs), or pin-based lighting in 80% of fixtures
- All ENERGY STAR qualified appliances if supplied by builder

TIER 1

- All ENERGY STAR v2.0 requirements including the Thermal Bypass Checklist
- Minimum 92 AFUE furnace, 85 AFUE boiler, or 8.5 HSPF heat pump
- Direct- or power-vented space and domestic hot water heating combustion appliances if located within the pressure boundary
- ENERGY STAR, ASHRAE 62.2-compliant mechanical ventilation
- All supplies and returns tested at ≤ 6 CFM25 to outside per 100 sq. ft. of conditioned floor area
- HVAC installation compliant with program checklist including Manual J, S & D

TIER 2

- ENERGY STAR v3.0 compliant, including site-specific HERS target, all checklists, and all requirements for HVAC installation, envelope, and duct tightness
- ENERGY STAR qualified central A/C or heat pump with minimum SEER 14.5 (includes ductless minisplits and packaged units)
- ENERGY STAR qualified central heat with minimum 95 AFUE furnace, 85 AFUE boiler, or 8.5 HSPF heat pump

This combination of strategies ensures that both participation and energy savings are maximized while working toward increasing market adoption of the new ENERGY STAR standard.

The program offers significant additional participant and market support, including:

- Technical and sales training for builders, contractors, and design and sales professionals
- Consumer marketing collateral, including a variety of materials for builders to use with consumers (yard signs, model home placards, fact sheets, brochures, banners, and so on)
- Participation and PR linked to events such as Parade of Homes
- Engagement with home builder associations (HBAs)/building industry associations (BIAs) and the realtor and appraisal community to raise awareness and understanding of the features, benefits, and value differential of program homes

In collaboration with a large regional bank, the program is in the process of releasing a preferential mortgage product specific to builders and buyers of program homes. A whole bill energy guarantee is also being explored and is expected to be incorporated into the incentive structure sometime in 2014.

Finally, the program utilizes a market-based delivery model that relies on independent rating companies (RESNET-accredited rating providers and certified raters) to market and provide rating and inspection services to builders. The program implements a robust quality assurance program to help ensure a level playing field for builder and rater participants, provide a feedback mechanism to inform training and program design, and support confidence in savings for the sponsoring utilities.

Coordination/Integration of Gas and Electric Utility

Both utility brands are associated with this program. Program materials feature both brands unless aimed specifically at nonoverlapping territory. Initially, the program name included both utility brands and the ENERGY STAR banner (“AEP Ohio/Columbia Gas of Ohio ENERGY STAR New Homes Program”). However, the length of the program name proved cumbersome and a barrier to consumer recognition. Additionally, given the addition of a non-ENERGY STAR qualified tier (based on the old ENERGY STAR version 2.0) and the link to the HERS Index through the incentive structure, a rebranding effort is currently being introduced under the name “EfficiencyCrafted.” EfficiencyCrafted Homes branding

will not include the utility names, but utility logos will continue to appear on all program materials.

Marketing is part of the scope of the common implementation contractor who, in turn, works with a marketing subcontractor selected in coordination with the two utilities.

Each utility has an assigned program manager supported by a team of additional resources, including an evaluation team leader, data and metrics analyst, operations manager, and administrative support.

The implementation contractor provides dedicated and regional program management roles supported by a regional quality assurance and technical support resource responsible for quality assurance (QA) of rating and inspection activity by independent raters. Operations are further supported by a dedicated administrator and a team of administration, technical, program design, and training personnel.

Each utility has an assigned program manager who interacts with the implementation contractor on matters related to budget and contract oversight, invoicing, incentive processing, reporting, goal setting, and performance. The two utilities' program managers collaborate with each other and with the implementation contractor on matters related to program design, training, marketing, and outreach and, in general, all externally facing facets of the program.

Because a single contractor implements the program, costs for common program management functions, including administration, quality assurance, training, and outreach, are shared or reduced. Management and administration fees are split 50/50; per unit QA fees apply based on territory and are split 50/50 at a lower rate for shared units. This is the same for training (although in reality all trainings are split). Unit- and utility-specific administrative functions such as incentive processing are reduced due to common resources but allocated to the appropriate utility on a per-unit basis. Costs for external functions, such as marketing development by an outside agency as well as expenses associated with marketing and training activities, are split 50/50 between the two utilities.

Columbia Gas of Ohio recovers expenses for the program through a DSM rider paid by their customers. AEP Ohio collects program costs through a rider on residential electric bills.

Columbia Gas of Ohio and AEP Ohio each have separate contracts with the implementation contractor who operates the program for both utilities. Incentives paid to builders are determined by each utility, and each utility claims the savings for its respective fuels when it provides an incentive.

Each utility performs its own impact and process evaluations.

Motivations/Reasons That Led to Gas and Electric Utility Cooperation for This Program

There is no policy mandate to combine gas and electric efficiency programs. While both utilities initially determined independently that they would like to offer a program for the new construction market, it quickly became apparent that compelling reasons existed to combine efforts.

Primary among these was the desire to cost-share expenses to reduce costs to ratepayers. Additionally, there was the desire to reduce barriers for builders and confusion for homebuyers. Columbia Gas and AEP Ohio share a significant portion of their respective service areas, while builders operate across utility territories. A single set of technical criteria and a single participation process (including enrollment, incentive application, quality assurance, and so on) simplifies upgrade decisions and reduces administrative burden. For consumers, a single, consistent message from both utilities eliminates competing signals and strengthens awareness of the brand and value proposition. From the utility perspective, the same combination of processes provides an opportunity for cost reduction and sharing.

Regulatory Issues

Regulatory bodies informally encourage coordinated programs, when possible, in Ohio. For this partnership, Columbia Gas of Ohio and AEP Ohio make separate filings with the Public Utility Commission of Ohio (PUCO) for their DSM programs, including programs that are offered jointly by both utilities.

Columbia Gas of Ohio was approved for a five-year DSM Action Plan from 2012–2016 in 2011. In their Finding and Order, the PUCO approved the continuation and expansion of Columbia Gas of Ohio’s Demand Side Management (DSM) programs, including the Residential New Construction program.

This program was filed and approved as part of AEP Ohio’s 2009–2011 EE/PDR Portfolio Plan and continued with the filing and approval of AEP Ohio’s 2012–2014 EE/PDR Portfolio Plan. The issue of fuel choice, such as gas versus electric water and space heat, is up to the builder and the customer. The regulators have let the utilities figure out how to implement.

Program Performance

Except where indicated, program results provided are for the total program (combined utility territories).

Program spending actual (millions)			
	2011	2012	2013
Total	\$2.1	\$4.4	\$6.3
Gas	\$1.2	\$2.4	\$3.3
Electric	\$0.9	\$2.0	\$3.0

Program energy savings

	2011	2012	2013
Gas (MCF)	23,495	51,001	78,450
Electric (MWh)	1,815	4,944	6,798

Savings indicated are gross.

Columbia Gas of Ohio’s draft impact evaluation comparing billing energy use data with projected usage concluded: “The billing data analysis found that the average natural gas usage of program homes was very close to the average projected usage from the REM/Rate software, averaging 4% less than projected in 2011 and 3% less than projected in 2012. The close agreement between actual and projected natural gas usage supports the reported savings from the program.” For AEP Ohio, its evaluation contractor, Navigant, reported a realization rate of 95% on MWh and 1.01 on MW for units evaluated in 2012.

EVALUATION REPORTS

- COH Process Evaluation 2012 (Opinion Dynamics)
- COH Impact Evaluation 2012 (Blasnik)
- AEP Evaluation 2011 (Navigant)
- AEP Evaluation 2012(Navigant)

Note that AEP Ohio’s methodology for counting completed homes based on payment date impacted evaluation results in 2012 and should be looked at together with the 2013 evaluation, when available, for a more representative picture of program performance.

Cost-effectiveness result

Utility Cost Test (UCT)

COH 2011 2.61

COH 2012 2.61

AEP 2011 4.0

AEP 2012 1.0 (see note above)

Total Resource Cost (TRC) test

COH 2011 2.11 (1.20 gas only)

COH 2012 2.02 (1.10 gas only)

AEP 2011 2.1

AEP 2012 0.4 (see note above)

Lifetime cost of conserved energy (CCE) in \$0.00 per kwh and/or therm

COH 2012-13 \$0.40/therm

AEP N/A

MARKET SHARE

This metric measure certified homes against new residential meters in each program territory:

- COH 2013 40%
- AEP 2013 24%

In 2013, ENERGY STAR version 3.0 certified units represented 38% of all program homes, up from 17% in 2012.

QUALITY ASSURANCE

A robust QA program reviews at least 5% of all rating files and field inspections (including a combination of shadow and blind in-field observations), providing feedback to program managers and raters on consistency with program standards. In 2013, rater performance was found to be 96.1% and 98.6% consistent with program standards for file and field QA, respectively. We believe that the credible threat of discovery provided by the QA program, coupled with the value of feedback for training and education purposes, has helped to ensure a level playing field and contribute to continuous improvement in rater quality and program performance.

Lessons Learned

Observations related to program design and joint delivery include the following.

A tiered ENERGY STAR and non-ENERGY STAR qualified structure proved effective at retaining participation during the introduction of version 3.0, without backtracking on program standards or performance. The number and proportion of version 3.0 certified homes have continued to grow with no attrition in overall participation or savings.

Linking incentives to HERS scores appears to have been very effective at driving builders toward incremental measures and higher savings, while additional measure-based requirements have contributed to addressing each utility's need to maximize cost effectiveness on an individual fuel basis.

Increasing codes and standards can place pressure on cost effectiveness and each utility's determination of incentive budgets and allocations at each efficiency level (i.e., by tier and HERS score).

When cost effectiveness and budget constraints come into play, program design decisions can take longer when two independent utilities are involved.

Effective communication is essential to resolving challenges that can arise when independent electric and gas utilities are working together.

Builder and rater feedback indicates that the single set of program technical requirements, administrative processes, and quality assurance monitoring is perceived as a significantly lower burden compared with having to participate in multiple programs. Evaluation

responses indicated that incentive processing time is also a significant driver of builder satisfaction, compelling both utilities and the implementation contractor to modify processes to expedite this step.

The “visual” combination of incentives from two utilities in shared territory provides the opportunity to present a more compelling value proposition than the individual incentives in isolation. Originally, uniform incentives were offered throughout both utility territories with each utility picking up the additional cost in its nonoverlapping area. While this may be ideal from the builder’s perspective and helped produce momentum early in the program, budget considerations and program cost-effectiveness issues did not allow it to continue. The program is jointly offered in overlapping territories. However, the incentives are now identified separately for each utility so that builders can combine with incentives offered by another utility’s program in a nonoverlapping territory if they can show they have met the requirements of both programs.

HOME ENERGY SAVINGS PROGRAM, COMED AND NICOR GAS**Program at a Glance**

Program name	Home Energy Savings Program
Targeted customer segment	Existing single-family residential homes that are both ComEd and Nicor Gas customers
Program start date	Pilot began 2010
Annual energy savings achieved (2013)	Program year is 6/1/12–5/31/13 Gas, Program Year 2: 253,445 therms ex-ante gross savings pending evaluation Electricity:, Program Year 5: 1,122 MWh ex-ante gross savings pending evaluation
Number of program participants	EPY5/GPY2: 2,762 assessments and 825 projects completed (per evaluation report not yet finalized). EPY4/ GPY1: 1,080 home energy assessments and 320 weatherization projects completed (per evaluation report). ²⁵
Peak demand (summer) savings achieved	31 kW ex-ante gross savings per evaluation, electric Program Year 4. PY5 pending evaluation
Spending for most recent year (2013)	EPY5/GPY2 program budget: approximately \$2.3 million Spending not available
Funding sources	Electric: ComEd Smart Ideas is funded by customers in compliance with IL Public Act 95-0481 as an "Energy Efficiency Programs" line item on each customer bill. Gas: Nicor Gas Energy Efficiency Program is funded by Nicor Gas customers in compliance with the Illinois Public Utilities Act (220 IL CS 5/8-104).
Websites	www.ComEd.com/HES www.NicorGasRebates.com/HES

²⁵ Each assessment is one residential housing unit. This is a single-family program. Weatherization projects are a subset of home energy assessments. Thus, there were 1,080 unique participants. The 320 projects are a subset of the 1,080 assessments.

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Program Overview

The Home Energy Savings program is a home energy retrofit program. The program includes an energy usage assessment, installation of energy efficiency products such as CFLs and aerators, and incentives to implement energy-efficient capital projects such as air-sealing and attic insulation.

A pilot program was conducted with Nicor Gas during 2010. The initial single-family pilot established the basic program structure which remains in place today. Customers received a discounted energy assessment, installation of energy efficiency products such as CFLs and aerators, and instant rebates to implement the recommended weatherization improvements such as air sealing and attic insulation.

In 2011, Nicor Gas and ComEd issued a joint request for proposal (RFP) to select an implementation contractor for a three-year program cycle. As the lead utility, Nicor Gas's supply team led the RFP efforts, but together, the utilities developed the RFP; reviewed, scored, and interviewed bidders; and selected the winning bidder. Each utility entered into a separate contract with the same implementation contractor (IC).

To participate in the program, a customer pays a discounted fee for the energy assessment, which is conducted by a BPI-certified energy advisor. The remainder of the energy assessment cost is offset by the utilities. Energy efficiency products such as CFLs, low-flow aerators and showerheads, and water heater pipe wrap are installed during the assessment. A programmable thermostat is also available for a nominal fee. At the end of the energy assessment, the customer is provided a customized report detailing recommended energy efficiency improvements for their home. The report also includes a proposal with fixed pricing to complete the work. The proposal includes generous instant utility rebates of 50% to complete the recommended weatherization. Once the proposal is signed by the customer and returned to the IC, the customer is assigned to one of the approximately eight program weatherization contractors to perform the work. All weatherization contractors have agreed to fixed program pricing to complete the work, material and installation requirements, and quality assurance and quality control inspections. After the work is completed, the contractor submits the necessary paperwork to the IC who then pays the contractor the

value of the instant rebate provided to the customer. The customer pays the contractor directly for the remaining balance. The IC also conducts quality assurance and quality control (QAQC) on a defined percentage of completed projects.

With fixed pricing and instant rebate, 30% of those getting assessments go on to do a project. Conversion rates over the program period can be calculated by dividing the number of projects by number of assessments (320 projects / 1,080 assessments = 30% conversion rate). Note that this is a snapshot approximation over the program year since some of the projects completed within that year may have had the assessment in the previous program year.

In September of 2013, an alternate way to participate in the Home Energy Savings program was launched. This open-market approach allows participating contractors to offer generous instant rebates for air sealing and insulation. The main difference to this new offering is that an assessment is not required and participating contractors are free to use market-based pricing for the weatherization work. To participate, a customer simply selects a participating contractor. The list of participating contractors is available on the utility websites. Currently, there are approximately 25 participating contractors in the network. Participating contractors are required to provide the instant rebate to the customer and include it on the invoice. The instant rebate is based on CFM50 air flow reduction and an insulation R value.

Measure	Incentive	Rebate amount
Air sealing	\$0.40 per CFM50 reduction in air flow	Up to \$600
Attic insulation starting at ≤R11 and ending at R38 or greater	\$0.50 per square foot	Up to \$600
Attic insulation starting between R11 and up to R19 and ending at R49 or greater	\$0.40 per square foot	

Participating contractors must be BPI-certified, agree to the program installation and material requirements and QAQC inspections, as well as attend program trainings. The majority of the program's kWh savings are achieved through the direct installation of CFLs. In order to maintain this aspect of the program in the new offering, participating contractors install up to ten CFLs per home. The program then compensates the participating contractors for the cost of the CFL and for its installation. This new offering has provided customers of both utilities more options to participate and, thus, an enhanced customer experience.

Coordination/Integration of Gas and Electric Utility

As the lead utility for the Home Energy Savings Program, Nicor Gas's marketing and design guidelines are followed when creating program marketing materials. All program materials

include both utility logos and funding disclaimers. The utilities have agreed upon a joint program disclaimer of: "This program is funded by Nicor Gas and ComEd customers in compliance with Illinois law." When the program markets or serves a Nicor Gas customer that does not have ComEd service (instead the customer is served by a municipal utility), the materials are branded Nicor Gas only, with no reference to ComEd. Similarly, when the program markets or serves customers with electric space heat provided by ComEd (where there are no natural gas savings opportunities), the materials are branded ComEd only, with no reference to Nicor Gas.

A marketing plan for the Home Energy Savings Program is developed each year by the implementer. Both utilities review and provide feedback on the plan before it is approved. The implementation contractor executes the marketing and outreach plan for the program; however, both utilities review and approve any events or marketing collateral. Both utilities also provide supplemental program-specific and umbrella marketing through their own outlets such as social media and e-mail blasts to customers when available. The utility marketing teams also coordinate umbrella efforts through regular meetings throughout the year. The intent of the meetings is largely information sharing about upcoming utility campaigns or lessons learned.

Program management is structured in that the utilities are the PAs with a program manager at each utility. The current IC employs energy advisors that conduct the energy assessments, as well as act as the general contractor for the contractors that perform the weatherization projects.

Both utilities manage and interact with the implementer directly. All three parties are involved in program decision making. There are offsetting biweekly operations and marketing calls which include both utilities and the implementer. Additionally, the utilities regularly review program objectives and goals providing the implementer with consistent guidance and oversight.

ComEd Smart Ideas, which includes Home Energy Savings, is funded by customers in compliance with IL Public Act 95-0481 as an "Energy Efficiency Programs" line item on each customer bill. On the gas side, Nicor Gas Energy Efficiency Program is funded by Nicor Gas customers in compliance with the Illinois Public Utilities Act (220 IL CS 5/8-104).

Program costs allocations are agreed upon by the utilities before each new program year. The implementation contractor then applies those allocations to the invoices for each utility. The cost allocation methodology considers the benefits to each utility rather than solely looking at the cost to implement the itemized tasks. The ultimate goal of the program is kWh and therm savings, and the value to each utility lies within the avoided costs to deliver these units of energy. Therefore, the cost allocation method uses the avoided cost to each utility to determine equitable cost-sharing values. The utility with the greatest percentage of avoided cost benefit is the lead utility.

Cost allocation for the Home Energy Savings program requires separate calculations for the direct-install measures, the energy audit, and implementation of the weatherization projects:

- Direct-install measure costs are allocated 100% to the benefitting utility. Water heating saving measures are charged to the utility providing the water heating fuel source, typically Nicor Gas. CFL costs and benefits are allocated to ComEd. All heating measures are allocated to the utility providing the heating, typically Nicor Gas.
- The energy assessment cost allocation was calculated by an average savings per assessment using agreed upon assumptions, inputs, and savings calculation methods. The savings from the assessment come from the direct-install materials. Once the savings per direct-install measure are calculated and summed to the program level, the avoided cost-per-unit-of-energy value is applied to determine the total avoided cost to each utility. In the case of EPY6/GPY3 of the Home Energy Savings program, the calculation results in allocating 28% to the electric utility and 72% to the natural gas utility.
- The energy efficiency project cost allocation is based on the average savings from a completed project. Applying energy cost avoidance for each utility, a cost allocation ratio can be determined. In the case of EPY6/GPY3 of the Home Energy Savings program, the calculation results in allocating 15% to the electric utility and 85% to the natural gas utility.

Any cost directly related to the assessment, such as marketing, applies the energy audit cost allocation. Any costs directly related to the energy efficiency project, such as contractor oversight, apply to the energy efficiency project cost allocation. The IC invoices each utility its portion of the program costs based on the agreed upon cost allocations.

The most recent program evaluation was performed by Navigant. Both utilities oversee the evaluation.

Motivations/Reasons That Led to Gas and Electric Utility Cooperation for This Program

Since the vast majority of single-family homes in the ComEd service territory are heated with natural gas, ComEd was unable to include this type of program cost-effectively in its original triennial energy efficiency portfolio as a stand-alone program. The advent of natural-gas-funded energy efficiency programs in 2011 made it possible for ComEd to jointly offer this type of program while remaining cost-effective.

Since the majority of energy savings are realized by the natural gas utility, Nicor Gas is the lead utility for branding and supply efforts. Both utilities are involved in program management, technical support, and funding for their respective portion of energy savings and program cost.

In terms of marketing and program development, a cooperative approach has many benefits. As the general message is the same – let us help you save money on your energy costs – a single, combined approach allows the partnering utilities to work together to gain

customer access and trust rather than doing so separately. It also eliminates potential confusion that could be caused by the presence of two, rather than one, utility weatherization program.

A joint approach is also optimal from the standpoint of customers. It streamlines and simplifies the steps they need to take in order to participate. It also minimizes the disruptions to the customer (scheduling, time in home, and so on).

Partnering with Nicor Gas has brought considerable value to the existing ComEd electric-only program for ComEd customers: investigating for natural gas and electric savings simultaneously is far more efficient than doing so separately, which makes the program more cost-effective for all parties. Further, it allows the utilities to address the energy efficiency needs of their customers in a more comprehensive manner. Electric measures which previously were not cost-effective, such as weatherization and thermostats, are now offered and provided through the combined program.

Finally, a single home visit and project instead of an electric-only project and a gas-only project lowers the overall program costs significantly of delivering such programs separately.

Regulatory Issues

Alignment of program years is very important for program and project management and simplifies things greatly overall. Fortunately, both ComEd's and Nicor Gas's program years are aligned: beginning June 1 of each year and ending May 31 each year.

Discrepancy in timing for plan submittals complicates planning for joint programs. For example, in 2013, ComEd's planning for its next three-year plan was forced to incorporate many assumptions about the level of gas utility funding/involvement, as its plan submittal deadlines were on a different timetable.

These regulatory issues related to timing are complicated by how state law set up the gas and electric savings targets on different timetables. Referring specifically to Illinois, Neumann describes a gap in depth of knowledge and program management among utilities related to how many years of experience the utilities have with the programs as the number one issue:

The most significant challenge is the difference in the age and experience of the gas utility programs compared to the electric utility programs. In addition, Section 8-103 of the Public Utility Act requires electric utilities to implement energy efficiency programs three years prior to the gas utilities (Section 8-104 of the PUA). Both sections have gradually increasing budgets for gas and electric programs to implement and procure energy efficiency. (Neumann 2013)

Statute does require regulators and utilities to support combined programs. The Public Utilities Act (PUA) requires coordination explicitly:

In submitting proposed energy efficiency plans and funding levels to meet the savings goals adopted by this Act the utility shall:

(6) Demonstrate that a gas utility affiliated with an electric utility that is required to comply with Section 8-103 of this Act has integrated gas and electric efficiency measures into a single program that reduces program or participant costs and appropriately allocates costs to gas and electric ratepayers. The Department shall integrate all gas and electric programs it delivers in any such utilities' service territories, unless the Department can show that integration is not feasible or appropriate. (ILGA 2014)

In the PUA, the Illinois Commerce Commission is directed to “develop and solicit public comment on a plan to foster statewide coordination and consistency between statutorily mandated natural gas and electric energy efficiency (‘EE’) programs to reduce program or participant costs or to improve program performance.”²⁶

Program Performance

Spending			
	ComEd *	Nicor (requested)	Total program budget
EPY4/GPY1	\$364,000	Not available	\$1,767,000
EPY5/GPY2	\$560,000		\$2,300,000
EPY6/GPY3 projections	\$930,000		\$3,250,000

²⁶ The ICC reports to the Illinois General Assembly on coordinated gas and electric programs. The "Report to the General Assembly Concerning Coordination Between Gas and Electric Utility Energy Efficiency Programs and Spending Limits for Gas Utility Energy Efficiency Programs" is available at <https://www.icc.illinois.gov/reports/report.aspx?rt=35>

Savings

	ComEd		Nicor Gas	
	Gross MWh	Net MWh	Gross therms	Net therms
Pilot	569	340	**	**
EPY4/GPY1	527	468	104,505	94,597
EPY5/GPY2*	1,122	973	253,445	235,554

*Evaluation report is not yet finalized. **Contact gas utility for pilot metrics

The metrics shown below were included in ComEd’s EPY1-3 triennial filing for the Home Energy Savings program:

Test results ComEd whole HES program three year triannual, electric only

TRC 3.99
 UCT 6.05
 CCE \$0.09 levelized lifetime rate. First year \$/kWh is \$0.83.

The metrics shown below were included in Nicor Gas’s GPY1-3 triennial filing for the Home Energy Savings program:

Test Results	GPY 1	GPY 2	GPY 3
TRC	1.4	1.5	1.5

Evaluation documents are available at www.ilsag.info/evaluation-documents.html.

Lessons Learned

The utilities have worked together effectively and have adapted their roles as dictated by changing circumstances. Standing biweekly meetings between both utilities and the implementation contractor and other meetings as necessary. This ensures all parties are aligned with the program goals and messaging. For the Home Energy Savings program, there are standing biweekly operations meetings, with offsetting biweekly marketing meetings.

Open and frequent communication between utility program managers may be through a regularly scheduled meeting or impromptu meetings or calls as needed, based on what approach works best for the utility program managers. Utility program managers should share what their utility goals are for the program, not simply from an energy savings standpoint but also related to customer satisfaction, utility objectives, long term goals, and so on. Both program managers should be in agreement on program direction and strategies and provide consistent direction to the implementer.

Early and ongoing assessment of implementation contractor performance and regular review of key performance indicators are critical to identifying and correcting deficiencies. Key performance indicators should be tracked and reported among all involved parties (both utilities and implementer).

Gathering feedback from all sources – customers, weatherization contractors, implementation contractors, and evaluators – is critical to ongoing improvement in program processes and marketing strategy. Feedback is collected through customer surveys, weatherization contractor meetings, focus groups, and quarterly meetings including both utilities wherein the implementation contractor presents updates on that quarter’s activities and forward looking activities, as well as through the collaborative evaluation process.

Developing transparent and representative tracking reports provides the program managers with the data and insights needed to improve cost allocation models and program performance. Providing the same weekly data report to each utility program manager ensures transparency and consistency.

The greatest challenge unique to a joint program is balancing natural gas and electric goals, budgets and objectives. For example, as the price of energy decreases, so may a utility’s available budget for the joint programs. One utility may want to ramp up a program’s participation to balance its portfolio, but the other utility may not have the resources or available funding to support an expansion.