

# **“Peeling Back the Onion” of National Grid’s Small Business Energy Efficiency Program**

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## **ABSTRACT**

National Grid provides energy efficiency services to business customers smaller than 200 kW through a direct install program. It provides turnkey services ranging from an initial audit to the delivery and installation of energy efficiency equipment to recycling of fluorescent ballasts and lamps. The first portion of the paper describes National Grid’s Small Business Program, types of projects and measures installed, and other key program elements.

According to E Source’s database of efficiency and demand-response programs, *DSMdat*, more than 50 different utilities offer programs providing either gas- or electric-related energy efficiency services to small businesses.<sup>1</sup> To the extent that program implementers share their experiences, small business customers and the energy efficiency industry will benefit. The paper then concludes with a brief review of key program elements based on existing Small Business Programs, primarily located in the Northeast.

## **MEASURES, PROJECTS, and PROGRAM DELIVERY**

### **Introduction**

National Grid’s Small Business Services Program (“Program”) provides direct installation of energy efficient lighting and non-lighting retrofit measures to business customers in Massachusetts, Rhode Island, and New Hampshire with an average demand less than or equal to 200 kW.<sup>2</sup> Table 1 provides some examples of typical customers based on “average” kW.

**Table 1:** Examples of Customers and Corresponding kW

<b>Customer Type</b>	<b>Corresponding kW (Approximate)</b>
Convenience and Package Stores Gas Station/Store	< 50 kW
Fast Food Restaurant (Smaller/Non-Electric) Library (Smaller)	50kW
Elementary School Full Service Car Dealership	100 kW
Middle School Large Athletic Facility (with pool)	150 kW
Small Medical Office Building Manufacturing Business	200 kW

<sup>1</sup> Reid, M. (E Source Companies LLC). 2007. E-mail communication to author. December 14.

<sup>2</sup> Non-metered business customers are eligible if their energy usage is less than or equal to 483,600 kWh per year (approximately 40,000 kWh per month).

As to be expected, “smaller the customer, smaller the project.” In 2007, projects for National Grid’s “smaller” small business customers averaged about \$3800 per project and \$8800 for “larger” small business customers.

**Financial Incentives and On-Bill Financing**

Financial incentives are designed to pay a portion of the total installed project cost. The company has historically paid between 75-80% of the project costs, with the remainder being the customer’s responsibility. In 2008, the customer contribution is increasing to 30%, primarily due to shortened customer paybacks, currently averaging less than one year due to higher electricity costs.

These customers have the option to finance their portion of the project cost using **on-bill** financing which, according to Program vendors, significantly contributes to closing the “sale.” Figure 1 provides a customer bill with the customer contribution included (albeit obscurely labeled as “Conservation Contrib”).

<b>DELIVERY SERVICES:</b>				
CUSTOMER CHG				16.01
DISTRIBUTION CHG				
DEMAND	6.21000 X	36.6 KW =	227.29	
ENERGY	.00147 X	7500 KWH=	11.03	
				238.32
TRANSITION CHG				
DEMAND	.44000 X	36.6 KW =	16.10	
ENERGY	.00262 X	7500 KWH=	19.65	
				35.75
TRANSMISSION CHG	.01132 X	7500 KWH=		84.90
ENERGY CONSERVATION	.00250 X	7500 KWH=		18.75
RENEWABLE ENERGY CHG	.00050 X	7500 KWH=		3.75
DELIVERY SERVICE				397.48
CONSERVATION CONTRIB				130.04
TOTAL DELIVERY SERVICES				527.52

**Figure 1:** Customer Bill Including Customer Contribution Toward Energy Efficiency Project

Participants may choose to finance at zero percent interest for up to 24 months or pay in full and have the amount due discounted 15%. In 2007, approximately 40% chose to finance over 12 or 24 months with the remainder opting for the one-time discounted payment.

**Projects: Prescriptive Lighting, Refrigeration and Comprehensive**

As mentioned above, energy efficiency projects come in many “shapes and costs” ranging from replicable, proven prescriptive projects to more complex comprehensive projects.<sup>3</sup> However, prescriptive lighting measures are the most commonly installed measures as these customers’ loads tend to be dominated by lighting.

<sup>3</sup> Regardless of the type of project, project costs are currently capped at \$50,000 to insure that the greatest number of customers can take advantage of the Program. In the vast majority of projects, the project cap is not an issue.

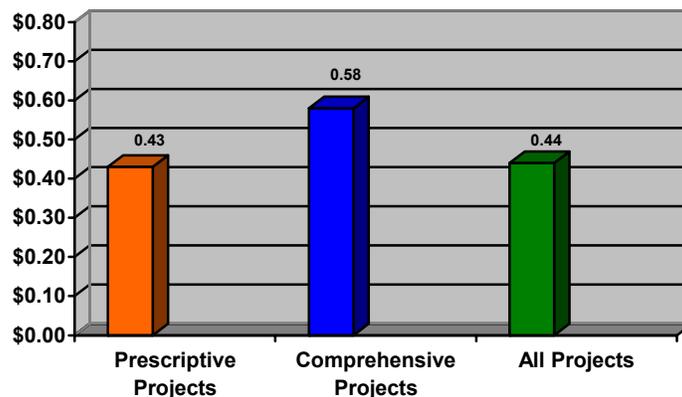
Examples include:

- Re-lamp/re-ballast of T-12 lamps and energy-saving magnetic ballast with T-8 lamps and electronic ballasts in a liquor store (prescriptive)
- Lighting redesign of an ice skating rink from 1000W metal halide fixtures to 5-lamp high output T-5 fixtures (comprehensive – lighting)
- VFD installed on a fan motor in an exercise facility (comprehensive – non-lighting)
- Installation of LED strip lights in a convenience store reach-in cooler (comprehensive - emerging technologies).
- Installation of controls on medium and low temp walk-in boxes to control temperature, defrost cycle, door and frame heaters of glass doors, and evaporator fans (comprehensive - refrigeration).
- Retrofit of evaporator coils in walk-in and freestanding medium and low temp units with electronically commutated motors (comprehensive - refrigeration).

In addition, approximately 10% of the Program budget is utilized for energy efficient refrigeration measures for walk-in coolers and freezers, refrigerated soft drink units and freestanding coolers and freezers (e.g. refrigeration units commonly found in convenience stores, pizza shops, small and midsize grocery stores, liquors stores, restaurants, and meat, produce, and fish cold storage facilities).

In the past few years, National Grid has expanded its focus to include comprehensive solutions such as Energy Management Systems (“EMS”) and Variable Frequency Drives (“VFD”). While not as prevalent in Small Business buildings as lighting and refrigeration measures, these comprehensive solutions have benefited customers such as hotels (EMS), auto body shops (VFD on a paint booth fan), and small manufacturing facilities (compressor replacement).

However, comprehensive projects have higher costs per kWh saved than prescriptive projects. Figure 2 provides 2007 average total project cost per gross annual kWh for National Grid’s prescriptive, comprehensive, and combined projects. As shown in Figure 2, the premium for comprehensive projects is approximately \$0.15 cents per gross annual kWh saved, nearly 33% more than prescriptive projects.



**Figure 2:** 2007 Average Cost Per Gross Annual kWh Saved

Over time, when successful, comprehensive measures evolve in to “prescriptive” measures as we gain experience with their implementation and savings. LED strip lights for reach-in coolers have this potential given the potential for replicating installations and their energy/demand savings. However, currently, their costs per kWh saved are approximately twice as much as prescriptive measures. See Figure 3 for a case study of installing LED strip lights.

**Customer:** Gas station/ food mart open from 5 AM to midnight, 7 days per week. Refrigeration lights are on 19 hours per day.

**Energy Efficiency Measure:** Replace 100-watt fluorescent lamps in the reach-in cooler with 38-watt LED strip lights.

**Savings and Costs:**

- Gross Annual kWh Saved: 3,825 kWh
- Cost per Gross Annual kWh Saved: \$0.78/kWh

**Figure 3:** LED Strip Light Case Study

### **Program Delivery**

In 2007, a total of approximately 1,700 energy efficiency applications were completed in MA, RI, and NH at a total project cost of approximately \$9.5 million. Identifying these projects, delivering the equipment, managing the installations, addressing warranty issues, and recycling are the responsibility of five labor vendors, one equipment vendor, a recycling vendor, and one utility program manager.

The labor vendors – four that are primarily lighting and one specializing in refrigeration – are responsible for the majority of work associated with these projects. These vendors are assigned exclusive territories, are responsible for achieving annual budget and kW/kWh savings goals, and are paid for installations, not audits. Table 2 summarizes their responsibilities. Several lighting vendors also have in-house expertise to manage comprehensive (e.g. non-lighting) projects.<sup>4</sup>

The lighting equipment vendor is responsible for providing energy efficient lighting equipment and materials and a recycling vendor picks up and disposes of the removed fluorescent lamps and ballasts.

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<sup>4</sup> National Grid does provide for, if needed, technical assistance to its labor vendors for projects involving non-lighting measures or specialized lighting applications.

**Table 2: Labor Vendor Responsibilities**

<b>Program Tasks</b>
<ul style="list-style-type: none"> <li>• Program Leads/Marketing: Leads are generated from direct mail campaigns managed by the vendors, trade shows, business group outreach, visitors to the National Grid web site, a toll-free phone number, and leads from other departments (e.g. transfers from Customer Service)</li> </ul>
<ul style="list-style-type: none"> <li>• On Site Energy Evaluations: Focusing primarily on lighting but may also include process, HVAC, and controls.</li> </ul>
<ul style="list-style-type: none"> <li>• Project Tracking/Work Flow System: entering and updating projects, scanning project documentation including contracts, invoicing, entering recycling pick up information.</li> </ul>
<ul style="list-style-type: none"> <li>• Customer Presentations: Report generated from project tracking system and presented to customers, contract signature.</li> </ul>
<ul style="list-style-type: none"> <li>• Material Ordering and Warehousing</li> </ul>
<ul style="list-style-type: none"> <li>• Management of Installations including Sub-Contractor Oversight</li> </ul>
<ul style="list-style-type: none"> <li>• Tracking Budgets and Savings Goals</li> </ul>
<ul style="list-style-type: none"> <li>• Customer and Equipment Problem Resolution</li> </ul>

All vendors are selected through a competitive bid process based on unit pricing for their respective services/materials.

- **Labor Vendors:** Bids are based on common lighting installations (e.g. relamp/reballast of 1, 2, 3 and 4-lamp fluorescent fixtures, installation of occupancy sensors) and are broken out, where applicable, for different ceiling heights (e.g. <12 and >12 feet) to account for differences in installation effort. Bid prices reflect the installation labor costs plus costs for project managers, auditors, program support staff, warehousing, and profit.
- **Lighting Equipment Vendor:** Bids are based on common lighting equipment such as electronic ballasts, T8 lamps, T8 and T5 fluorescent fixtures, compact fluorescent fixtures, LED exit signs, and lighting controls such as occupancy sensors. The vendor is responsible for delivery of all lighting materials either to the labor vendor warehouse or job site. The bid also includes warranty terms for lamps and ballasts with the vendor being responsible for managing the replacement of failed equipment.
- **Recycling Vendor:** Bids are submitted for unit pricing for fluorescent lamps and ballasts. The labor vendor installation contractor is responsible for packaging the materials in containers provided by the recycling vendor. Pick up scheduling is the responsibility of the recycling vendor and the recycling vendor has service quality standards defined so the waste materials are removed in a reasonable amount of time.

**Project Tracking/Work Flow Software**

In its earliest years, National Grid (then NEES companies) tracked its energy efficiency programs on a spreadsheet which evolved in to a mainframe database system.

National Grid currently uses a web based system – “InDemand” – that allows labor vendors to manage their projects including data entry, generate project proposals, contracts, and work orders,

as well as invoicing National Grid for completed work. Additionally, InDemand automatically generates recycling tasks for the recycling vendor, provides an online repository for documentation such as customer contracts and vendor savings' spreadsheets.

InDemand is also used by the Program Manager to track program budgets and savings, generating reports, billing customers via an interface with the customer information system, and paying vendors via an interface with the Accounts Payable ERP system.

## KEY PROGRAM ELEMENTS

Program implementers are challenged to manage and improve their own programs as well as sharing and learning from others. Table 3 summarizes a few key program delivery and design options found in existing programs in the Northeast Region.

**Table 3:** Program Design Options Based on Existing Programs

Program Element	Options/Current Practices
Targeted/Eligible Customers	The majority define eligible customers based on average kW, using either 100 kW or 200 kW as the eligibility criteria.
Incentive Levels	Nearly all customers are required to contribute with <b>customer</b> contributions ranging from 30% to 65%. One program pays 100% of installed cost and another provides 100% for certain type of customer (government).
Financing Options	Financing options include: <ul style="list-style-type: none"> <li>• On bill or separate-bill financing at 0% for varying number of months (ranging from maximum of 3 to 24 months)</li> <li>• Discount (15%) for one time payment</li> <li>• No financing available</li> </ul>
Contractor Assigned Exclusive Territory	Most contractors are assigned an “exclusive” territory; however, two programs permit contractors to serve any eligible customer.
Prescriptive and Comprehensive Measures	<ul style="list-style-type: none"> <li>• Prescriptive lighting measures are universally available.</li> <li>• Most programs offer prescriptive refrigeration measures through a separate contractor.</li> <li>• “Custom lighting” and comprehensive measures are available in approximately half of the programs.</li> </ul>
Project Tracking System	<ul style="list-style-type: none"> <li>• Contractor supplies project tracking system and provides documentation/data to sponsors when invoicing</li> <li>• Program Sponsor provided: may be web accessible.</li> </ul>
Prescriptive Measure Pricing	<ul style="list-style-type: none"> <li>• Materials price set through sponsor RFP and contractor provides fully loaded unit “labor” price.</li> <li>• Contractor provides materials and labor unit pricing. Hourly rates charged for project managers, auditors, coordinators and support staff so measure costs are separate from all other costs associated with program delivery.</li> <li>• Program Sponsor dictates unit pricing.</li> </ul>
Post-installation Inspections	All programs conduct random post-installation inspections of completed projects. Some programs post inspect 100% of projects over a specified dollar amount.

Program Element	Options/Current Practices
Recycling	All programs offer recycling. Either the Program Sponsor implements through a competitive bid process or the Contractor arranges and bills the Program Sponsor at cost. Customers either pay a portion of the recycling costs or it is paid in full by the Program Sponsor.

The choices made regarding these program elements are a function of internal and external factors such as program maturity, organizational issues, emerging technologies and transformed markets, budget changes (increases/decreases), and, increasingly, a response to climate change. For example:

- **Program Start Up:** Using a vendor-supplied tracking system is faster (in terms of getting the program “on the street”) than developing a single, centralized system. But it may also create barriers to entry for new vendors given the time and effort required for a vendor to develop a tracking system.
- **Customer Eligibility:** Defining the eligible customers is a function of factors ranging from customer demographics, the extent to which these customers are served by other programs, and organizational changes. For example, National Grid increased its eligible customers from 100 kW to 200 kW in 2005 to reflect:
  - These customers being underserved through the “Large” Business Program
  - Organizational changes that reduced the numbers of internal staff available to market the program and manage projects for these customers.

### **In Closing**

As mentioned in the beginning of this paper, the extent to which implementers share their experiences, both positive and negative, will enable our customers and ratepayers to realize the maximum benefits from these energy efficiency programs as well as contribute to mitigating climate change.