

***Commercial/Industrial New Construction Programs***

*Exemplary Programs*

Business Energy Solutions: New Buildings ..... 4-2

Design2000plus and NH Saves @ Work..... 4-6

Energy Conscious Blueprint Program ..... 4-9

Energy Design Assistance—Custom Consulting ..... 4-12

Energy Incentives from We Energies ..... 4-15

Sustainable Communities Program..... 4-21

*Honorable Mention*

Advanced Buildings™ Program..... 4-24

Business New Construction ..... 4-27

Commercial Construction Program ..... 4-31

WorkPlace New Construction Program..... 4-35

*Commercial/Industrial New Construction Programs  
Exemplary Program*

***Business Energy Solutions: New Buildings  
Energy Trust of Oregon, Inc.***

**PROGRAM OVERVIEW**

Business Energy Solutions: New Buildings is a commercial new construction program administered by Energy Trust of Oregon, Inc. that provides services and incentives along four separate program track offerings (the following outlines contains some enhancements that will go into effect on January 1, 2008):

1. *Standard Track*: Incentives for prescriptive energy savings measures:
  - Incentives up to \$100,000 per project;
  - Incentives for equipment and component upgrades;
  - Incentives for high efficiency lighting, lighting controls, motors, air conditioners, heat pumps, air-to-air heat exchangers, chillers, demand control ventilation, variable speed drives and natural gas equipment;
  - No energy calculations required;
  - Technical assistances incentives of \$500 for projects that receive \$3,000 or more in equipment incentives; and
  - Standard Track may be combined with Custom Track making available up to \$465,000 per project.
  
2. *Custom Track*: Incentives for custom designed building energy systems that result in reductions in energy use compared to the same building built to Oregon code/commons practice:
  - Incentives up to \$300,000 per project;
  - Incentives for building energy systems which result in energy reductions in the annual energy use as compared to an Oregon non-residential energy code minimum building of the same type and occupancy;
  - Energy calculations and documentation of energy savings are required;
  - All energy measures are screened and must pass an Energy Trust cost-effectiveness test to receive an incentive;
  - Technical assistance incentives offered at 50% of the total eventual incentive that a project will receive up to a cap of \$25,000;
  - Additional incentives for commissioning for energy savings measures with variable performance or controls. Incentives offered at \$0.03/kWh and \$0.20/Therm with a cap of \$40,000; and
  - Standard Track may be combined with Custom Track making available up to \$465,000 per project.

3. *LEED™-NC Track*: Incentives for projects achieving LEED-NC certification from the US Green Building Council (USGBC). Incentives are awarded based on the number of Energy and Atmosphere points achieved by the project, building size and occupancy type:
  - Incentives up to \$300,000 per project; and
  - Incentives for projects participating in the USGBC's Leadership in Energy and Environmental Design rating and certification program for commercial new construction projects.
  
4. *ENERGY STAR®*: Incentives awarded for buildings that acquire an ENERGY STAR rating from US Environmental Protection Agency using the online Portfolio Manager tool. Buildings must have completed construction and been occupied after January 1, 2005:
  - Incentives to achieve the ENERGY STAR building performance certification from the U.S. Environmental Protection Agency (EPA);
  - Incentives from \$1,000 to \$15,000 per eligible project;
  - Facilities must meet certain criteria and achieve a rating of 75 or higher using the EPA's tools, Portfolio Manager and Target Finder;
  - Standard Track projects may also apply for the ENERGY STAR track-- Custom and LEED track projects are not eligible; and
  - Projects must have completed construction and occupancy after January 1, 2005.

Energy Trust contracts with a program management contractor (PMC) to manage projects and market the program. Internal Energy Trust staff works with the PMC to manage the budget to deliver cost-effective energy savings and to plan and implement program strategy. In addition, Energy Trust staff provides information technology and marketing support. Science Applications International Corporation is the incumbent PMC. The program will be going out for bid via a request for proposals in mid-2008.

## **PROGRAM PERFORMANCE**

Projections indicate that by the end of 2007 Energy Trust's New Buildings program will have successfully acquired around 46.8 GWh of electricity savings and 1.2 million Therms of gas savings. The program continuously delivers services in the marketplace that are well received by customers.

**New Buildings Program Electric Results by Year**

	<b>Savings</b>	<b>Total Costs</b>	<b>Incentives</b>	<b>Weighted Average Measure Life</b>	<b>Levelized Cost 3% DR (\$/kWh)</b>
2004	2,884,006	\$1,347,184	\$57,616	12.3	\$0.046
2005	6,567,848	\$2,421,939	\$784,144	16.2	\$0.029
2006	17,474,636	\$3,449,182	\$1,944,271	18.1	\$0.014
Projection for 2007	19,908,711	\$4,750,000	\$2,553,233	19.0	\$0.017
<b>2004-2007</b>	<b>46,835,201</b>	<b>\$11,968,305</b>	<b>\$5,339,264</b>	<b>17.9</b>	<b>\$0.019</b>

**New Buildings Program Gas Results by Year**

	<b>Savings</b>	<b>Total Costs</b>	<b>Incentives</b>	<b>Weighted Average Measure Life</b>	<b>Levelized Cost 3% DR (\$/therm)</b>
2004	22,296	\$151,338	\$28,005	11.8	\$0.69
2005	80,078	\$257,639	\$403,916	10.6	\$0.36
2006	604,742	\$696,962	\$383,829	16.9	\$0.09
Projection for 2007	530,000	\$820,000	\$535,623	17.7	\$0.11
<b>2004-2007</b>	<b>1,237,116</b>	<b>\$1,925,939</b>	<b>\$1,351,373</b>	<b>16.8</b>	<b>\$0.12</b>

*Note: "DR" is "discount rate"*

Since the program's inception the primary target market audience has been architects, engineers and green buildings consultants. This audience is ideally poised to understand and make the case for energy efficiency to their clients. We believe that this marketing strategy has been quite effective as we have achieved penetration of around 12% of the total potential new commercial square footage. In general, the program successfully recruited participation from a high proportion of the large buildings being built in Energy Trust territory. This is likely due to the high interest in green building practices in the Portland metropolitan area.

Moving forward, the program is planning a strategy to more effectively penetrate the market for small- and medium- size new construction projects throughout Oregon. A large part of this effort will be focused on the design-build market.

**LESSONS LEARNED**

Perhaps the most innovative approach designed and implemented by the program is the addition of the LEED™-NC track; the program has enjoyed an increasing number of applications and completions for projects pursuing a LEED rating.

The structure of the program—with four distinct tracks—has been a key to the program's success. These tracks allow customers to match program services with their needs and interests, particularly as related to the size, scope and budgets of different construction projects.

A key strength is the development of program offerings to coincide with the market's capabilities. Examples of this flexible approach include:

- The program will work with anyone that brings a project to the table. You don't have to be a pre-approved provider to receive incentives through the program.
- For the custom track, the program does not dictate a method for analyzing energy savings. Instead, the program will accept energy analyses from any application. The program does conduct quality control to make sure that the results are feasible.
- New approaches are added to meet the needs of the market. The program added the LEED-NC track to enable program participants to pursue a LEED-NC rating with the US Green Building Council. The advantage for participants is they only have to run one energy model for USGBC using an ASHRAE 90.1 baseline. The program uses a calculation methodology to determine what the savings are according to Oregon code which is a bit more stringent than ASHRAE 90.1.

## PROGRAM AT A GLANCE

**Program Name:** Business Energy Solutions: New Buildings

**Targeted Customer Segment:** Commercial new construction

**Program Start Date:** 2003

**Program Participants:**

Projections indicate that the program will have completed around 440 projects at the end of 2007.

**Annual Energy Savings Achieved:** Projected savings through the end of 2007 of 46.8 GWh electricity—and 1.2 million therms natural gas

**Peak Demand (Summer) Savings Achieved:** Not available

**Other Measures of Program Results to Date:**

- Electric levelized cost: \$0.02/kWh
- Gas levelized cost of \$0.12/Therm

**Budget:**

- 2008 Electric program budget: \$7.8 million
- 2008 Gas program budget: \$1.2 million

**Funding Sources:** Energy Trust funds come from a 1999 energy restructuring law, which required Oregon's two largest investor-owned utilities to collect a three percent "public purposes charge" from their customers.

**Best Person to Contact for Information about the Program**

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*Commercial/Industrial New Construction Programs  
Exemplary Program*

***Design 2000plus (Massachusetts and Rhode Island)  
NH Saves @ Work (New Hampshire)  
National Grid***

**PROGRAM OVERVIEW**

Design 2000*plus* targets time dependent opportunities for the installation of energy-efficient equipment in new construction, renovation, remodeling and failed equipment replacement. The program recognizes in its structure that the largest influence to developing a high performance new built environment mandates that design decisions must occur as far upstream as possible in the design phase. Consequently a great deal of attention is paid to designing products and services within the program that reach forward to comprehensiveness and map directly to the energy savings opportunities at the time these investment decisions are being made by customers. Design 2000*plus* has two tracks that look the energy savings potential more holistically. These two programs are “Advanced Buildings,” a standard developed by the New Buildings Institute, which is applicable for smaller buildings. The other track uses a “Comprehensive Design Approach,” (CDA) which uses computer simulation to look at the interactive savings of efficient design options.

Financial incentives are designed to cover 60% to 90% of the incremental costs difference between standard and energy-efficient equipment or by the incremental cost to the customer down to a one and one half year payback, whichever is less. By providing these incentives, the cost barrier to investing in better performing buildings through enhanced energy efficient design and systems is substantially reduced. Design 2000*plus* offers both prescriptive and custom incentives. Prescriptive incentives are available for advanced lighting systems, HVAC systems, premium efficiency motors, variable frequency drives and compressed air systems. For more complicated systems, the custom approach is used which allows more site specific, integrated and comprehensive energy savings analyses. As the program has matured, a larger portion of the savings have been achieved through custom and CDA projects, accounting for 52% of all Design 2000*plus* net annual savings for 2005.

The program’s goal is to make consideration of energy efficiency options an integral part of the design and construction process. In doing so, it creates long-term market transforming effects by influencing architects, engineers, and the building design community to incorporate energy-efficient design strategies and equipment in the early design phase, thereby raising the energy efficiency standards of normal building practices. In addition the program underscores the opportunity to maximize long term cost savings through full life cycle cost analysis as well as address best practices in mitigating climate impacts of buildings. Much of this success stems from a recognition that an integrated engineering and architecture approach will provide customers the best returns on their financial investment.

National Grid markets the program through extensive personal communication by its account managers with customers, vendors, and contractors. Other important marketing channels are via seminars, training sessions, and other direct marketing approaches. Through Design 2000*plus*, National Grid also actively supports regional and national market transformation initiatives such as Motor-up, Cool Choice, DesignLights™ Consortium<sup>1</sup> and the New Buildings Institute.

Planning and oversight of the program done centrally through National Grid's Business Energy Efficiency Services Group

## **PROGRAM PERFORMANCE**

The program has achieved significant success over its many years of operation. Since 1990, Design 2000*plus* has saved over 5,408 cumulative GWh and treated more than 12 million sq. ft of commercial space under CDA. Through National Grid's ongoing evaluation efforts, the Design 2000*plus* has demonstrated continued cost effectiveness.

New England, like many parts of the country, has experienced significant growth in electricity use. Investments in energy efficiency through programs like Design 2000*plus* have helped defer costly transmission and distribution upgrades to meet this demand. ISO-New England, the regional transmission organization (RTO) for New England, has recognized the value that energy efficiency programs like Design 2000*plus* have in meeting the transmission planning needs of the region.

Another major impact is on the designers of new buildings. Design 200*plus* has help transform markets by giving architects and design engineers knowledge and experience in energy-efficient and sustainable design practices. This has helped them market efficiency better while, at the same time, making advancements in building codes and equipment standards more acceptable to the market.

## **LESSONS LEARNED**

Over time the Design 2000*plus* has evolved as technology has changed and has added new features and technologies in order to keep the program fresh and cost effective.

Using the Comprehensive Design Approach and Advanced Buildings guidelines have proven to be highly effective processes to promote better performing buildings. National Grid has built on its experience with Design 2000*plus* to extend this approach to its Schools Initiative and the implementation of the Collaborative for High Performance Schools. These initiatives within Design 2000 *plus* build on National Grid's goal to change the way buildings are designed and constructed to a far greater standard that enhances sustainable practices.

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<sup>1</sup> Motor-up and Cool Choice consist of a consortium of utilities providing energy efficiency programs in Massachusetts and Rhode Island. The DesignLights™ Consortium consists of a consortium of energy efficiency program providers in the northeast under the umbrella of the Northeast Energy Efficiency Partnerships.

Beyond the direct energy and environmental benefits achieved by the program, Design 2000*plus* also is viewed as a significant opportunity to advance economic development by organizing all the parties that are involved in design, construction, operation, supply and financing of new and renovated buildings toward better building practices. These channels represent large scale economic development influences that create more jobs, enhance better competitive business environments and encourage manufacturers and distributors to develop and move into the marketplace more advance energy efficient products and services.

## PROGRAM AT A GLANCE

**Program Name:** Design 2000*plus* (Massachusetts and Rhode Island) and NH Saves @ Home (New Hampshire)

**Targeted Customer Segment:** Large commercial, industrial and government customers

**Program Start Date:** 1990

**Program Participants:** Not available.

**Annual Energy Savings Achieved:** 5,408 GWh cumulative since 1990.

**Peak Demand (Summer) Savings Achieved:** Not available.

**Other Measures of Program Results to Date:** Over 12 million square feet of commercial space has been affected via the Comprehensive Design Analysis

**Budget:** 2007 budget total is \$14.6 million—Massachusetts, Rhode Island and New Hampshire customers served by National Grid

**Funding Sources:** Massachusetts systems benefits charge

**Best Person to Contact for Information about the Program**

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*Commercial/Industrial New Construction Programs  
Exemplary Program*

***Energy Conscious Blueprint Program  
The Connecticut Light and Power Company  
The United Illuminating Company  
Connecticut Energy Efficiency Fund***

*Note: Energy Conscious Blueprint is a program offered by each of the two largest investor owned distribution utilities in Connecticut: The Connecticut Light and Power Company (CL&P) and the United Illuminating Company (UI) with funding from the Connecticut Energy Efficiency Fund (CEEF). This profile is of the collaborative Energy Conscious Blueprint program. Individual company program data are presented in the “Program at a Glance” section.*

## **PROGRAM OVERVIEW**

The Energy Conscious Blueprint (ECB) program takes a collaborative team approach by the Companies to promote energy efficiency for new construction, additions, major renovation and equipment replacement projects for commercial and industrial facilities. ECB is striving to influence innovative, energy-savings and cost-effective designs before construction. ECB is administered by the Companies and funded by the Connecticut Energy Efficiency Fund (CEEF). Connecticut’s Energy Conservation Management Board provides consultative guidance throughout the ECB program design process.

ECB seeks to influence energy-efficient building practices in the field of new construction. The Companies are achieving this goal by offering design-based incentives to architects, designers and engineers, which have the ability to specific energy-efficient measures that exceed ASHRAE building code baselines by 30% for lighting, and meet or exceed the qualifying energy-efficiency requirements on mechanical equipment. The Companies take an active approach in demonstrating how proven energy-efficient technologies are cost-effective to incorporate in the design and construction of new buildings through a number of channels, including:

- Professional seminars,
- Lunch and learn sessions, and
- Tradeshow appearances.

The Companies also utilize design bonuses and grants as incentives to encourage their customers to build highly energy-efficient buildings. ECB’s energy experts are involved early with the architects, customers and engineers to advocate for the incorporation of energy efficiency in a building’s design and construction. ECB staff are involved in every design and construction process, from simple analyses of individual energy-efficient measures to more detailed DOE-2 building energy use simulations of how designs and packages of measures will perform in the facilities. These design-phase analyses allow designers and customers to assess the long-term savings and performance of measures before investments are made. ECB examines a full range of building end-uses, including HVAC, fans, lighting, controls (such as occupancy sensors),

pumps, motors and variable frequency drives. The program evaluates and provides incentives to most measures that will save electrical energy (kWh) if: (1) any additional costs can be justified by energy savings and associated energy cost savings, and (2) the measures exceed building codes or standard practices.

Customer incentives are typically based on the energy efficiency of a design or incremental costs between less expensive, standard efficiency equipment and a more expensive, high efficiency option. The proposed energy-efficiency measures also must exceed minimum building code requirements (in Connecticut these are ASHRAE 90.1-2001 and all pertinent addenda) regarding energy efficiency and performance. Incentives also are available to design teams to encourage the development of integrated, high efficiency designs and to incorporate high-efficiency alternatives. To qualify and receive these types of incentives, the design team needs to involve ECB early in the design process.

ECB offers two tracks for customer involvement: (1) comprehensive and (2) prescriptive. The comprehensive track is for buildings 50,000 square feet or larger with more complex opportunities for energy conservation and energy-efficient design. The prescriptive track is for projects smaller than 50,000 square feet or larger projects with only basic opportunities for energy savings. Typical prescriptive measures are energy-efficient lighting technology and design, occupancy sensors, energy-efficient HVAC equipment, premium efficiency motors, variable frequency drives and ENERGY STAR® dry-type transformers. The prescriptive incentives for the transformers were discontinued in 2007 due to upgrades in Connecticut's Energy Codes.

## **PROGRAM PERFORMANCE**

In 2006 the ECB program completed more than 350 new construction projects statewide. These projects saved Connecticut customers more than 826.7 MWh of electricity---approximately \$3.1 million in electric bill savings. Peak demand savings in 2006 were 13.5 MW. In 2007 ECB will have completed another 350 new construction projects.

## **LESSONS LEARNED**

Building designers—the architects and engineers--are the final decision-makers when it comes to efficiency (behind the walls). To get the most energy efficiency out of projects, it is important to understand the design community and make them an ally. The new construction design community is concerned with designing the building once, getting it built within budget and on time. ECB utilizes in-house energy experts since many in the design community see outside consultants as competitors. ECB's design, marketing and services focus on these needs and realities of the building design and construction process.

ECB and its predecessor programs have achieved their goals by working successfully with building architects and engineers, as well as building project decision-makers. ECB's long record has established its staff as credible experts who understand the building design and construction process and are able to work effectively within that framework. Early involvement in this

process is critical to achieving designs that incorporate higher levels of energy efficiency. Program incentives also have proven critical to enable customers to invest in higher first-cost technologies.

## PROGRAM AT A GLANCE

**Program Name:** Energy Conscious Blueprint Program

**Targeted Customer Segment:** All commercial and industrial customers involved in new construction projects.

**Funding Sources:** Connecticut Energy Efficiency Fund (3 mils / distributed kWh)

*Connecticut Light & Power*

**Program Start Date:** 1989

**Program Participants:** Over 300 projects in 2006. About 350 projects in 2007.

**Annual Energy Savings Achieved:** 813 MWh savings in 2006

**Peak Demand (Summer) Savings Achieved:** 5 MW in 2006

**Other Measures of Program Results to Date:** Annual bill savings to customers in 2006 estimated to be about \$3.1 million.

**Budget:** \$ 12.3 million in 2006

**Best Person to Contact for Information about the Program**

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*The United Illuminating Company*

**Program Start Date:** 1989

**Program Participants:** Approximately 135 projects with 50 new construction projects.

**Annual Energy Savings Achieved:** 13.8 MWh in 2006

**Peak Demand (Summer) Savings Achieved:** 4.7 MW in 2006

**Other Measures of Program Results to Date:** Measures installed in 2006 will yield 192 MWh lifetime savings

**Budget:** \$3.2 million in 2006; \$2.9 million in 2007

**Best Person to Contact for Information about the Program**

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*Commercial/Industrial New Construction Programs  
Exemplary Program*

***Energy Design Assistance—Custom Consulting  
Xcel Energy***

**PROGRAM OVERVIEW**

Energy Design Assistance—Custom Consulting (EDA/CC) seeks to achieve demand and energy savings by working with owners and design teams to implement cost-effective energy efficiency strategies early in the design process. By taking a look at integrated systems in the beginning of the design process, customers can make a building more productive, more comfortable for the occupants, and less costly to operate in the future.

Energy Design Assistance (EDA) is available in both Xcel Energy's Colorado and Minnesota service territories. The program offers energy expertise during the design and construction phases of commercial and industrial new construction projects. The process uses computer models and a well-established method for exchanging information with the design professionals, contractors, developers and building owners. Important information is provided at critical points in design about the value and application of strategies for reducing peak demand and energy use. Xcel Energy administers the program with help from outside energy design consultants in Colorado and Minnesota.

A “whole building” approach is used to identify the net effect of multiple strategies on a project. This approach provides an opportunity for more impact, by trading less effective ideas that may be in the budget for more effective, new concepts. The bundling of strategies also provides protection against the usual value-engineering phase of the design/construction process, which typically cuts individual elements of projects based on their first cost (primarily) and impact on the tangible elements of the building, with little regard for on-going issues such as energy use.

In addition to technical assistance Xcel Energy provides significant financial incentives to building owners to improve the cost-effectiveness of more energy-efficiency materials and equipment. Xcel Energy also reimburses architects and engineers directly to offset the incremental cost of their participation time. The customer incentives are based on performance better than code requirements. Xcel Energy pays customers cash incentives of \$170-\$275 per peak summer kW reduced based on percent saved over energy code requirements. Natural gas incentives are offered at \$2.00 per MCF saved in Xcel Energy natural gas service territory in Minnesota only.

Incentives are paid only after a rigorous verification process is completed. Verification ensures the measures that are expected are actually installed. Savings realized from the Custom Consulting program have an additional degree of confidence associated with them, from the perspective of the design team, the owner, and Xcel Energy.

## PROGRAM PERFORMANCE

EDA-CC has established a solid track record with proven results over its many years of operation, as demonstrated in the summary table below:

### Direct Energy Savings and Other Benefits

	2003	2004	2005	2006
<b>kW Achieved</b>	15,365	8,791	14,755	14,079
<b>Generator kWh Achieved</b>	53,559,933	35,361,025	63,295,630	57,418,970
<b>Electric Spend Actual</b>	\$5,131,743	\$3,991,494	\$5,753,906	\$5,617,026
<b>Electric Participation</b>	84	56	70	77
<b>MCF Achieved</b>	83,783	22,613	14,904	28,033
<b>Gas Spend Actual</b>	\$222,713	\$133,178	\$135,702	\$184,844
<b>Gas Participation</b>	22	10	20	26

## LESSONS LEARNED

Energy Design Assistance—Custom Consulting has a long history. The program began in Minnesota in 1993 under the name, Energy Assets. In January 2006, Xcel Energy launched the program in its Colorado service territory. The EDA-CC program has sought to transform traditional design team approaches by encouraging a whole building or integrated design by providing new information to designers and owners early in the design process. This information is primarily in the form of results from DOE2 computer simulations of energy-saving strategies. In addition, the designers, owners, and contractors are provided information of how strategies need to be implemented in the design. Subsequent to the designers' and owners' decision to implement a set of strategies, they are guided through the documentation process to ensure that the selected strategies are designed into the building, and after initial occupancy, the verification portion of the program provides information about how far the strategies have been implemented and how well they perform.

A barrier to this type of design approach has been the extra up-front costs for the additional analysis. Xcel Energy's program overcomes this barrier by funding the consultant-based analysis and verification processes. Xcel Energy also compensates the architectural and engineering team for its participation in the design process. To encourage owners to implement the recommendations developed in the design services provided by the program, Xcel Energy provides financial incentives for implementing cost-effective strategies above the Minnesota baseline (Minnesota State Energy Code--ASHRAE 90.1-1989) and the Colorado baseline (IECC 2003—ASHRAE 90.1-2001).

The program is positioned well for continued success; due to both its own track record and a marketplace that increasingly values the services provided. Sustainable design is an objective on a growing number of development projects in new buildings markets. Energy analysis and verification, such as offered under the Custom Consulting program, is a primary component of any project based on sustainable design. The Leadership in Energy Efficient Design (LEED<sup>TM</sup>) system, developed by the US Green Building Council (USGBC), offers (among other areas) points for increasing levels of energy efficiency as measured in a way very similar to Custom Consulting.

Key aspects of EDA-CC's success include:

- A well-defined process for participation by both design teams and project owners/decision-makers;
- An established and solid track record demonstrating success;
- A program that is well-known and well-accepted by architects and engineering firms;
- A positive view of Xcel Energy as an independent 3<sup>rd</sup> party;
- Cost coverage for professional time by architects and engineers;
- Minimal risk to customers; and
- Verified savings.

## PROGRAM AT A GLANCE

**Program Name:** Energy Design Assistance—Custom Consulting

**Targeted Customer Segment:** New construction, additions, and major renovations for commercial and industrial customers with facilities of at least 50,000 sq. ft.

**Program Start Date:** A predecessor program offering design assistance began in 1993

**Program Participants:** In 2006 there were 77 electric projects and 26 projects

**Annual Energy Savings Achieved:** 57.4 GWh and 28,033 MCF in 2006

**Peak Demand (Summer) Savings Achieved:** 14.1 MW in 2006

**Other Measures of Program Results to Date:** Over 400 new buildings reviewed--approximately 84 million sq. ft. of building space.

**Budget:** Colorado: \$2,100,000; Minnesota: \$5,500,000 (both 2007 budgets)

**Funding Sources:** Utility ratepayers (DSM program budget in Colorado; Conservation Improvement Program budget in Minnesota)

**Best Person to Contact for Information about the Program**

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*Commercial/Industrial New Construction Program  
Exemplary Program or Honorable Mention*

***Energy Incentives from We Energies  
Commercial & Industrial New Construction Program  
We Energies***

## **PROGRAM OVERVIEW**

Energy Incentives from We Energies Commercial & Industrial New Construction Program captures energy efficiency and peak load reduction opportunities through a comprehensive effort to influence building design and construction practices. The program works with prospective building owners and developers, design professionals, and construction contractors to deliver high performance buildings that provide improved energy efficiency, systems performance, and comfort. Energy saving targets are accomplished by stimulating incremental improvements of efficiency in lighting, HVAC, and other building systems. The program captures synergistic energy savings by encouraging the design and construction of buildings as integrated systems.

An important focus of efforts is moving knowledge gained by designers and architects through program participation into their standard construction practices. The program has been designed to integrate market transforming activities into implementation while achieving near-term energy savings from active construction projects.

Program resources to achieve energy saving and market transformation objectives are applied through four primary offerings:

- Targeted ***Education, Information, and Outreach*** on integrated design practices and benefits are provided directly to participants through the program and to the broader market by coordinating with outside efforts. Program staff time and resources focus on information dissemination and teach/learn-by-example during projects with program participants. To encourage market transformation while recruiting program participants, the program coordinates with outside efforts including the state-wide Advanced Buildings™ education effort (a separate Energy Center of Wisconsin membership-sponsored market transformation initiative supported by We Energies and other Wisconsin utilities), the Wisconsin Green Building Alliance (including their annual Sustainable Energy Efficiency SE<sup>2</sup> Leadership Conference), AIA and ASHRAE technical events, the Milwaukee Green Task Force, and Menomonee Valley Partners (urban redevelopment). The credibility and relationships built through involvement in outside efforts help the program recruit construction projects that are early in the design process, when opportunities to integrate energy saving measures into the project are greatest.
- The program offers ***Technical Assistance Services*** to provide capabilities that are not yet fully adopted in the market. Services include facilitation in the design process, reviewing plans and construction documents, assisting with design strategies, analyzing energy

savings, hourly energy simulations, and verifying installation and operation of measures. Technical assistance is primarily provided by the program implementation contractor.

- The program offers financial ***Design Incentives*** to the design team to help offset the costs of developing designs that provide as-built performance that is more energy- efficient than their standard practice designs. Payments to the primary design team member are made after the start of construction once program criteria have been met. To encourage designers to achieve the greatest performance possible, design performance incentives are 10% of the measure incentive awarded to the project. Design incentives also reward following an integrated design process, conducting energy simulations, and submitting for LEED® Silver or better certification.
- The program offers financial ***Measure Incentives*** to owners and developers to help reduce cost barriers to adopting electric energy saving measures that have not yet been accepted as standard practice for construction. Payments are made after the program verifies that measures are installed and fully operating or capable of full operation in the case of seasonal uses.

Technical assistance, design incentives, and measure incentives are offered in varying degrees on individual projects to balance the program resources applied with the potential for saving energy and changing behavior. The program channels projects through one of two participation approaches:

- ***Comprehensive Approach*** offers the highest level of technical assistance and financial incentives for custom design solutions. This approach allows the design team the greatest flexibility to meet energy performance goals by adopting integrated design solutions analyzed through whole-building energy simulations. This approach is chosen when project size, schedule, complexity, and interest level justify a high level of program resources to achieve the full benefits of integrated building design. Measure incentives are paid following a simple formula based on simulated energy savings relative to baseline (\$200/kW + 2 cents/annual kWh). Incentives for natural gas saving measures are provided through a separate state-sponsored program.
- ***Advanced Buildings™ Approach*** provides a menu of financial incentives and technical assistance to encourage integrated design. Measure incentives are paid for meeting performance criteria described in the *Advanced Buildings Benchmark™* technical reference guide for whole building, system and component performance (Published by New Buildings Institute, copyright 2005, viewable at [www.advancedbuildings.net](http://www.advancedbuildings.net)). Design incentives are available for employing integrated design approaches. This approach is chosen when there is opportunity to achieve energy savings through integrated design, but the project size or schedule warrants a more streamlined approach.

Building size, project type, design stage, and project opportunities guide the selection of participation approach offered on the project. This determination is made by the program on a case-by-case basis. Generally, new construction and major “gut” renovation projects over 80,000 square feet are channeled to the Comprehensive approach when there is commitment by the owner and design team in the pre-design or schematic design stage to explore a wide range of design options. New construction and renovation projects smaller than 80,000 square feet are most often channeled to the Advanced Buildings approach, as are projects larger than 80,000

square feet that do not justify the Comprehensive approach. Projects under 80,000 square feet have received simulation assistance for leading edge design. The performance criteria method of the Advanced Buildings approach has proven useful for working with projects that are design-build, on a fast completion schedule, and simpler industrial and warehouse buildings.

We Energies is the managing administrator for the program, which is part of a portfolio of programs designed to meet a 55 MW regulatory requirement for the company. We Energies employs a single implementation contractor, the non-profit Energy Center of Wisconsin, to handle all aspects of C&I New Construction program design, management, marketing, delivery, field implementation, technical assistance, energy simulations, and project inspection to minimize hand-offs and referrals within program delivery. The Energy Center of Wisconsin has extensive contacts in the design community through leadership positions with state and regional chapters of AIA and USGBC.

## PROGRAM PERFORMANCE

The program began with a pilot program year in 2005 and was expanded to full scale in 2006 when strong demand for the program indicated the program could achieve substantial resource acquisition by 2008.

The program has achieved significant savings and market impacts in a relatively short time. As shown below, “Completed” savings are projects that have been completed and inspected, while “Committed” savings are projects currently under construction that will be complete by December 31, 2008. The kW impacts below are diversified gross summer peak demand (1 pm to 4 pm, June through August).

<b>Direct Savings Performance</b>	<b>Commercial</b>	<b>Industrial</b>	<b>Total</b>
Completed kW through 11/30/2007	1,457	1,773	3,230
Committed kW as of 12/1/2007	2,996	574	3,570
Total kW Installed by 12/31/2008	4,453	2,347	6,800
Active Recruitment Period	30 months	30 months	30 months
Annual kWh Installed by 12/31/2008	11.9 million	8.4 million	20.3 million
Total floorspace (sq. ft.)	4.5 million	3.0 million	7.5 million
Comprehensive Approach Projects	20	4	24
Advanced Buildings Approach Projects	21	26	47
Total Number of Projects	41	30	71
Watts per square foot impact	0.99	0.77	0.90
Annual kWh per square foot impact	2.64	2.79	2.70

More than half of the projects were smaller than 80,000 square feet, 40 of the 71 projects, but these contributed only 1,469 kW, or 22 percent of the total savings. The Advanced Buildings Approach was followed by 47 projects, large and small, that provided 3,200 kW reduction, slightly less than half of the impacts. About one-third, or 24 projects, followed the Comprehensive Approach, but these projects accounted for 3,600 kW or roughly half the total program reduction. Industrial companies account for roughly 40 percent of the participating projects, square feet, and energy impacts.

For the 71 projects, the program has had significant involvement with 93 unique design professionals from 67 different firms, including 36 architects representing 32 firms. Educational events facilitated or supported include full-day sustainable design training with 50 to 160 attendees (Integrated Design, Lighting, Sustainable Envelope, Ventilation, eQUEST), the SE<sup>2</sup> Conference (about 300 attendees), building tours, and the AIA Wisconsin annual convention.

## **LESSONS LEARNED**

We Energies has offered a new construction program that has been successful in the non-residential market. Innovative features of the program include the following:

1. The greatest innovation is in the use of existing non-profit initiatives to ease We Energies entry and exit from the market. We Energies positioned itself to be an ally for existing non-profit organizations and initiatives, trusting that the passionate non-profit players already within the market would deliver project leads, awareness, and savings, and continue with a vibrant environment for achieving lasting market transformation benefits. Two national initiatives that have received support are the Advanced Buildings effort and the LEED rating system. By supporting Advanced Buildings, LEED, and ENERGY STAR® (and the local organizations that deliver them), We Energies reduces investment in the program by using some pre-existing materials, reduces market confusion that can be created as programs come and go, and works towards long-term, sustained energy efficiency by supporting existing efforts.
2. We Energies focuses on all non-residential new construction and renovation to meet the needs of its specific service territory—both commercial and industrial facilities. By addressing industrial facilities as well as commercial, We Energies has expanded the potential participant base as well as met needs of a very important customer segment. The marketing effort specifically targets industrial companies, design-build firms, and contractors that build the majority of new industrial facilities, and works with existing organizations facilitating brownfield redevelopment.

We Energies New Construction program provides technical assistance that directly addresses how a high performance building can support the manufacturing process. This requires expertise in the field that can listen to customers explain process requirements, and respond with strategies for reducing energy intensity using a “different language” than commercial green design. For example, energy efficient buildings are discussed in terms of “lean manufacturing” concepts rather than as “green buildings.” .

3. Employing a one-call, one-person, and one-face-to-face meeting delivery approach tailored to meet the needs of the construction process. The program assigns a single professional architect or engineer from the Energy Center of Wisconsin to handle the initial contact between program and project team; and the same architect/engineer will meet with the designers and customer to discuss efficiency options, review resulting design drawings, and complete all the savings and incentive paperwork. If projects require more meetings or energy simulation, those resources are applied as needed. This

allows fast-track projects to participate with minimal communications, and a very low time commitment for customers and their design team to participate in the program.

4. Two program tracks accommodate a wide range of projects, with no project too large, too small, too complex, or too simple. Projects are rejected for participation if the design and construction documents are already complete and final when they contact the program.
5. We Energies finds it important to focus on education and participant satisfaction as primary participant outcomes, and promotion and recognition of their program as secondary. By selecting an implementation contractor who had long-standing relationships within the design community, We Energies could focus effort and program funds towards achieving energy savings and demand reduction while minimally investing in marketing and program promotion. The first evaluation report by the independent evaluator for the program found that 100% of participants were very satisfied with the level of service through the program, 90% were very satisfied with the program overall, and 76% were very satisfied with We Energies for bringing the program to them.
6. The program conducts very little direct advertising and promotion to recruit projects. Recruitment is primarily through networking within the design community and during educational activities facilitated by the program implementer. Repeat participation by design team members and developers is another common source of projects.
7. To ensure lasting influence, the program seeks to empower the design and construction community to propose efficient options to owners and developers absent intervention by future programs. This goal is accomplished through an extensive educational effort that includes one-on-one project consulting, lunch and learn sessions for individual firms, and educational events on sustainable design. When providing technical assistance, the program seeks to work through the design team rather than disrupt their natural relationship with the owner. This approach has meant that the independent evaluator has had to include surveys with key members of the design team to verify program influence, because surveyed owners were not aware of the extensive program activity involving the design professionals.

## PROGRAM AT A GLANCE

**Program Name:** Energy Incentives from We Energies C/I New Construction Program

**Targeted Customer Segment:** Commercial and Industrial, excluding multifamily

**Program Start Date:** Pilot program was offered in 2005; program expanded to full-scale in 2006

**Program Participants:** 71 projects totaling 7.5 million square feet

**Annual Energy Savings Achieved:** 20.3 GWh for measures to be installed by 2008

**Peak Demand (Summer) Savings Achieved:** 6.8 MW for measures to be installed by 2008

**Other Measures of Program Results to Date:**

**Budget:** Approximately \$3.7 million for the period of 2005 through 2008.

**Funding Sources:** Utility rates

**Best Persons to Contact for Information about the Program**

- David Ciepluch, We Energies
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- Email: [david.ciepluch@we-energies.com](mailto:david.ciepluch@we-energies.com)
  
- Kevin Grabner, Energy Center
- Phone: 608-238-8276 x154
- Email: [kgrabner@ecw.org](mailto:kgrabner@ecw.org)

*Commercial/Industrial New Construction Programs  
Exemplary Program*

***Sustainable Communities Program  
San Diego Gas & Electric Company***

## **PROGRAM OVERVIEW**

The Sustainable Communities Program is designed to encourage sustainable development, promote green building design practices, and create a variety of demonstration sites that will serve as models for other projects in San Diego Gas & Electric's (SDG&E) service area. This regional program provides incentives for qualified projects that greatly exceed the California Energy Efficiency Standards, obtain Leadership in Energy and Environmental Design (LEED®) Certification, or equivalent, and evaluate on-site renewable energy systems.

In 2003 SDG&E proposed the Sustainable Communities Program (SCP) to the California Public Utilities Commission (CPUC) as a progressive approach for the utility to influence sustainable development in the San Diego region. This unique program was approved by the CPUC and launched in 2004, becoming the model for future utility sustainable community programs in California.

The program targets both residential multifamily new construction and non-residential new construction. Eligibility requirements are summarized for each category below:

- *Residential multifamily new construction:* Any residential new construction apartment, town home or condominium project that meets the following criteria in the schematic or design development phase: (1) has a minimum of 10 dwelling units; (2) is located within the service territory of SDG&E; (3) exceeds the 2005 California Energy Efficiency Standards by a minimum of 15% for the applicable climate zone; (4) commits to sustainable design practices; and (5) evaluates installation of on-site renewable energy.
- *Non-residential new construction:* Any new construction or major renovation building project that meets the following criteria in the schematic or design development phase: (1) is located within the service territory of SDG&E; (2) exceeds the 2005 California Energy Efficiency Standards by a minimum of 20% on a whole building performance basis; (3) obtains LEED certification (or equivalent); and (4) evaluates installation of on-site renewable energy.

Owner incentive payments are available to either building owners or builder/developers, but not both, with respect to the same project. The incentives are the following:

- *Residential multifamily. \$50,000 maximum per development project*
  - Climate zones 1-7: \$165 per dwelling unit
  - Climate zones 8-16: \$220 per dwelling unit
- *Non-residential. \$150,000 maximum per project*
  - \$0.10 - \$0.25 per annualized kWh saved

- \$0.34 - \$1.00 per annualized therm saved

An additional 20% incentive is available to projects that exceed the 2005 California Energy Efficiency Standards by 20%, certify for LEED or equivalent, and complete an evaluation of on-site renewable generation. Design team incentives are also offered for non-residential projects.

## **PROGRAM PERFORMANCE**

The program has grown rapidly. Eleven projects have successfully completed the program, 14 are in progress (2007) and over 45 additional projects are interested in participating. The program manager and the project manager work closely with prospective and current participants to encourage, give design assistance, guidance and education throughout the entire project. Total incentives for projects completed or in development currently total over \$1.2 million.

The eleven completed projects and the 14 currently in progress, create an annual energy savings exceeding 3,528,265 kilowatt hours (kWh) combined. A wide range of projects have participated in the SCP, including the Ranch House at Del Sur, the first LEED Platinum building in San Diego County; Sun Harbor Marina, the first LEED certified marina in the world; two LEED Gold buildings, TKG Consulting Engineers (the first LEED certified building in the San Diego region) and the San Ysidro Department of Motor Vehicles (the first California State building in San Diego County to achieve LEED® Gold). Other completed projects include a multi-family affordable housing complex, a building at Camp Pendleton and a library and recreation center for the City of San Diego.

The SCP uses two standard metrics to ensure it is cost effective from an administrative standpoint. Both the total resource cost (TRC) test and the program administrator cost (PAC) test show positive benefit-to-cost ratios. The incentive payments and costs are structured to ensure the program is cost effective when just the direct energy savings are counted as benefits. In addition, energy and environmental benefits resulting from other sustainable design elements incorporated accrue without being accounted for. SDG&E has raised the issue of broadening the TRC evaluation methodology to encompass the indirect energy benefits of green buildings (e.g., reduced water treatment energy use). This utility and others are studying this issue for inclusion in future programs.

## **LESSONS LEARNED**

Many utilities and related organizations offer programs that promote energy efficiency in new buildings, both residential and non-residential. Numerous utility-sector programs provide incentives and technical assistance for the incorporation of renewable energy in buildings. SCP is unique, however, in that SDG&E installs utility owned on-site renewable energy systems, such as photovoltaics, on customer owned green building projects. This integrative, comprehensive approach that SCP takes for energy efficiency and renewable energy systems makes this an innovative, pioneering program in the area of green buildings.

Knowledge gained from the SCP is shared with interested parties not just locally, but also nationally and internationally. Highlights of outreach efforts include a presentation at the Tokyo World Gas Conference, a meeting with the Swedish Minister of the Environment, and a tour of one LEED Gold building for the Chief Conservation Officer of Ontario, Canada. Since 2005 formal presentations and “lunch and learns” have been given by program staff to over 800 people in addition to conference presentations about SCP and the value of sustainable buildings. Additional outreach has included extensive involvement with the US Green Building Council and the San Diego Regional Sustainability Partnership, presentations and sponsorship at the annual San Diego Green Conference, and sponsorship of San Diego’s Solar Week that was attended by over 500 people in 2006.

SCP staff conducts tours of participating projects. This educates prospective participants about the program and allows them to experience first hand how to transfer successful sustainable and energy efficiency technologies to their own buildings. Case studies are created to highlight completed projects and share information about lessons learned and are available on the website. Thousands of case studies and SCP fact sheets have been distributed at events, conferences and presentations.

SDG&E takes an innovative approach to looking beyond the building envelope to achieve embodied and upstream energy savings while helping its customers maintain high energy-efficiency goals and, at the same time, developing sustainable building projects.

## PROGRAM AT A GLANCE

**Program Name:** Sustainable Communities Program

**Targeted Customer Segment:** Builder/Owner/Design Teams for Residential Multifamily and Nonresidential new construction (including schools and government buildings)

**Program Start Date:** 2004

**Program Participants:** 11 completed projects; 14 in progress.

**Annual Energy Savings Achieved:** 3.5 GWh for projects completed to date.

**Peak Demand (Summer) Savings Achieved:** Not available.

**Other Measures of Program Results to Date:** 45 new projects have expressed interest in program.

**Budget:** SCP has an approximate \$1,680,000 three year budget for the years 2006-2008. The single year budget for each year is approximately \$560,000.

**Funding Sources:** California Public Utilities Commission Public Goods Charge

**Best Person to Contact for Information about the Program**

- Sally Muir, Program Manager
- Phone: 858-654-1247
- Email: SMuir@semprautilities.com

*Commercial/Industrial New Construction Programs  
Honorable Mention*

***Advanced Buildings™ Program  
National Grid***

**PROGRAM OVERVIEW**

The Advanced Buildings™ program at the national level is a set of standards supported by training and education resource materials. National Grid, in its service territory, has developed an incentive program along with training for the local design professionals and project specific technical support. An outside architect works part time under contract along with National Grid's own in-house professional staff to deliver the program. National Grid first introduced it to its customers and stakeholders in the Spring of 2005 with training and education programs. In the fall of 2005 National Grid began design work on the first prospective Advanced Buildings project. In 2005 extensive effort was put into creating a 4-hour professional training around the Advanced Building Benchmark standard that was first published in January of that year. In midyear 2007 a new version of the program was released nationally that will deliver even greater savings than what has been achieved to date and will also qualify projects for USGBC LEED NC points. In 2006 effort was divided between a large scale training and education effort, and working with design teams to implement the practices on actual projects. Trainings in 2006 included more than 20 "Lunch and Learn" sessions and five full four hour AIA accredited training sessions. NSTAR assisted with the administration and marketing of the training efforts through project management. Training content development was principally managed by National Grid. Over 1000 design professionals have been trained in New England to date through these efforts.

National Grid staff have taken the lead on developing program criteria and administration including; technical analysis, sales and marketing efforts, and incentive program design. Work of National Grid staff has been supported by outside engineers and contractors who assisted with energy modeling on specific projects and who participated in creating and delivering training sessions.

National Grid supported also Western Massachusetts Electric in providing training for their customers. National Grid currently operates the program in Massachusetts, New Hampshire and Rhode Island. The Advanced Buildings program is a nationwide program and National Grid has also been a leader in developing the program nationally from its earliest inception.

**PROGRAM PERFORMANCE**

Two projects have been built under the National Grid Advanced Buildings program. Another five are in various stages of design and construction. And designs have been completed for 4 more that are in construction. The first two completed projects should readily achieve 20 to 30% savings versus minimally code compliant buildings. These savings are achievable with relatively

simple and cost effective upgrades. The added efficiency features have had simple paybacks of less than 1.5 years after incentives provided by the utilities. Both projects have been very well received by their owners---a bank and a medical center.

The program has quickly built close ties with the local architectural community through its extensive training program. Prior to this program architects largely been at the periphery of National Grid's efforts in the area of commercial/industrial building energy efficiency. As a result of the efforts with Advanced Buildings they are now recognized and courted as the best change agents for applying Advanced Buildings designs and approaches in current projects. In the first 18 months of the program, over 900 building design professionals were reached through training programs created under the direction of National Grid and with financial support and administrative support from local partners NSTAR and Keyspan. The vast majority of those were architects. One direct impact is that architects now have been approaching National Grid with potential projects for this and other eligible programs---something that had not occurred to any great extent previously.

The program also is having impacts beyond its own building projects. In the 2 years since the Advanced Buildings Benchmark standard was first published, it has risen to be recognized by as a path to Energy and Atmosphere Credits in LEED NC V 2.2. Further, due to local efforts led by National Grid it now recognized as a path to compliance with the Commonwealth of Massachusetts, Governor's Order for sustainable design practices in construction new state owned facilities.

## **LESSONS LEARNED**

National Grid's Advanced Building program is a comprehensive approach to building energy efficiency that includes lighting, envelope, mechanical systems and controls. It is also a fundamental change for National Grid's programs in that it expands its program focus to specifically address designs and technologies that may save fossil fuel (natural gas and others), not electricity (although the program also clearly address electricity-only savings). Advanced Buildings is National Grid's first commercial program that equally weights fossil fuel and electric efficiency in its efforts in guiding design teams, transforming our programs to meet the true promise of a comprehensive approach to efficient design.

National Grid has developed this program by taking a ground-up approach, starting with funding and investing staff time in the work to create a new nationally recognized "beyond code" building efficiency standard. It then created a set of professional training and marketing materials to introduce this new system to the design market in the lower New England States. It was also important for National Grid to integrate this effort with related commercial/industrial programs and service. In this case this meant creating an incentive mechanism within the existing National Grid Design 2000 plus Commercial DSM program to promote application of this system in actual projects.

National Grid has been a leader among the sponsors of the national Advanced Buildings program. It has been one of the first utilities to promote its application. Within National Grid's

service territory its Advanced Buildings program has quickly become the flagship offering within National Grid's full complement of commercial/industrial program offerings. National Grid's success with developing and delivering Advanced Buildings to its target market has been very influential in shaping similar efforts by other sponsors and organizations. National Grid's practical experience also has been valuable in guiding revisions to the technical criteria for the updated version of Advanced Buildings released in June of 2007.

## PROGRAM AT A GLANCE

**Program Name:** Advanced Buildings Program

**Targeted Customer Segment:** Small commercial new construction under 80,000 square feet is the primary market but it carries over into new commercial construction of all sizes

**Program Start Date:** 2005

**Program Participants:** 2 completed buildings, 4 other projects in or ready for construction; one in process.

**Annual Energy Savings Achieved:** \$38,000 energy cost savings combined from a 20,000 Sf Medical office building and a 50,000 SF office building which are built and occupied.

**Peak Demand (Summer) Savings Achieved:** Not available.

**Other Measures of Program Results to Date:** Training sessions have reached over 900 building design professionals, primarily architects

**Budget:** \$125,000 plus one internal staff half time position for 2007.

**Funding Sources:** Massachusetts state system benefit charges

### Best Person to Contact for Information about the Program

- Fran Boucher
- Phone: 508-421-7299
- Email: francis.boucher@us.ngrid.com

*Commercial/Industrial New Construction Programs  
Honorable Mention*

***Business New Construction  
Efficiency Vermont***

**PROGRAM OVERVIEW**

The Business New Construction initiative at Efficiency Vermont has blazed a market transformation trail that is worthy of consideration by other utilities. There are two major factors responsible for this success: (1) long-standing, wide and deep collaboration with design and construction professionals; and (2) an annual buildings conference and design competition.

Nearly every architectural engineering and design office throughout the state works with Efficiency Vermont. Each one has a copy of Efficiency Vermont's *High Performance Design Guide* and *Advanced Buildings Energy Benchmark for High Performance Building* – not to mention an educational guide for clients and a commissioning guide. These valuable resources have been coupled with Efficiency Vermont's outreach and direct support of design and construction partners to meet customer needs with energy-efficient design. Together, the resources and collaborative efforts have raised design professionals' awareness and knowledge of energy-efficient design possibilities in this energy-expensive region. Further, the annual Better Buildings by Design conference and its attendant design competition have generated high participation rates and high interest among design and construction professionals region-wide. As a result, there is widespread participation and deep savings in Vermont's business new construction market.

In Vermont approximately 500 new commercial and industrial buildings are constructed or undergo major renovation each year. Almost half of these new buildings are small (less than 5,000 square feet), with only about 10% of them larger than 25,000 square feet. Whether commercial buildings are built on speculation or for a particular owner, the technical decisions about building construction and systems, including energy decisions, are almost always made by the architects and engineers or the design/build team, with the contractors often contributing expertise and with some small input from developers or owners. Efficiency Vermont therefore focuses its services early in the design and specification process of new construction projects, and allows for the maximum integration of efficient design and the highest potential for energy saving at the least cost.

Efficiency Vermont's Business New Construction program works in collaboration with a commercial building project's team from the earliest design stage through project close-out to develop and implement an optimal package of energy efficiency measures. Efficiency expertise is integrated into each project, based on customer, design team, and contractor needs. Services include: technical assistance, field verification of efficiency measures, training and information resources, financial incentives for the incremental costs of high efficiency equipment and building design features, and commissioning.

Technical assistance is customized to support the project objectives of designers and owners while integrating optimal energy-efficient approaches. It might include:

- Customized comprehensive design assistance;
- Review of architectural and engineering plans and specifications coupled with consultation on energy efficiency opportunities;
- Energy and economic analyses of building systems;
- Project follow-through and cash-flow analyses to ensure that efficiency measures are not removed from the plan during value engineering or construction phases;
- Support for commissioning services; and
- Provision of post-construction metering or utility data analysis to verify original savings estimates.

Training and information resources include hard copy and online versions of the following publications produced by Efficiency Vermont, as well as copies of efficiency code and guidelines updates and revisions:

- The *High Performance Design Guide* and *Advanced Buildings Energy Benchmark for High Performance Buildings*: Developed to assist design professionals to become familiar with and incorporate high-performance elements into their projects
- The *Owner's Guide to High Performance Buildings*: Intended to educate building owners and therefore to help design professionals sell high performance to their clients
- The *Commissioning Guide for Vermont*: Promoting and supporting commissioning efforts in new buildings

The program offers financial incentives for the incremental costs of high-efficiency building and equipment, including the software that may be required to run it as well as design and commissioning incentives.

## **PROGRAM PERFORMANCE**

An evaluation of Efficiency Vermont's business programs completed in 2006 for the program period 2003-2004 found that the majority of the state's architects and engineers have worked with Efficiency Vermont. The evaluation also found that 45% of the participating architects and 65% of the participating engineers reported an increase in their use of energy efficiency measures.

For the period from calendar 2003 through 2005, this program saved 27,000 MWh of annualized savings which translates to more than 465,000 MWh of lifetime savings. This is equivalent to approximately 1/3 of Efficiency Vermont's business sector savings for this period.

Most new commercial and industrial buildings in Vermont could consume 30% to 50% less energy if designed and constructed using the latest high-performance strategies, compared to those constructed with standard building practices. When Efficiency Vermont started in 2000, the program struggled to gain traction in the design community. Today Efficiency Vermont is

brought in on almost all major new construction projects in the state. Many design firms, including some of the largest architectural and engineering firms in the state, have established internal policies to involve Efficiency Vermont in every one of their major building projects, as has the engineering staff of Vermont's Department of Buildings and General Services.

## LESSONS LEARNED

Efficiency Vermont has learned that a vigorous focus on design professionals was a disproportionately fast and effective way to accelerate adoption of energy-efficient design in new construction. The methods for achieving this were relatively simple: Project managers worked with design and construction professionals in a collaborative way, establishing that they could bring significant added value to projects, without competing with the design and construction professionals in obtaining and maintaining productive relationships with clients and customers.

Efficiency Vermont has also achieved very positive recognition with design and construction professionals from two major sources: (1) publications such as its *Design Guide for Architects* (published in cooperation with the Vermont chapter of the American Institute of Architects); and (2) its Better Buildings by Design Conference, an event that now attracts more than 1,000 participants across the Northeast. The conference provides in-depth information on new building materials, advanced technical training, and a forum for exchange of design ideas.

An additional lesson learned is that peer pressure works. Integral to the conference is a design competition for buildings in New Construction and Renovation/Retrofit categories. This competition has consistently raised the bar on energy efficient design in the region, and has added value to the conference, as well as to the industries it serves.

Throughout its 7-year existence, Efficiency Vermont has grown in its outreach and publicity efforts, recognizing the value to present and future customers of explaining bottom-line successes in various types of projects throughout the state. This has been achieved via publishing case studies, receiving regional and national recognition, and recognizing the work of other professionals during the Better Buildings by Design Conference.

All of these approaches have positioned Efficiency Vermont as a service that goes beyond technical assistance. The name Efficiency Vermont is increasingly becoming associated with high performance and leadership in helping business and residential customers with their energy-saving strategies and using energy efficiency as an investment tool.

## PROGRAM AT A GLANCE

**Program Name:** Business New Construction

**Targeted Customer Segment:** Commercial and industrial new construction

**Program Start Date:** 2000

**Program Participants:** A total of 84 business new construction projects were completed in 2006, bringing to 575 the total number of projects completed since 2001, when Efficiency Vermont began tracking Business New Construction projects.

**Annual Energy Savings Achieved:** For 2003- 2005, the program saved 27 GWh (annualized). In 2006

alone, the savings were approximately 4 GWh (annualized).

**Peak Demand (Summer) Savings Achieved:** Not available

**Budget:** \$2 million in 2006

**Funding Sources:** Energy efficiency charge on electricity ratepayers' bills (public benefits charge)

**Best Person to Contact for Information about the Program**

- Blair Hamilton, Policy Director, Vermont Energy Investment Corp.
- Phone: 802-658-6060 ext. 1024
- Email: bhamilton@veic.org

*Commercial/Industrial New Construction Programs  
Honorable Mention*

***Commercial Construction Program  
Long Island Power Authority***

**PROGRAM OVERVIEW**

The Commercial Construction Program (CCP) is the largest program of Long Island Power Authority's (LIPA) Clean Energy Initiative. CCP promotes a range of energy-efficient electric technologies and design opportunities through incentives, education, information and technical assistance. CCP is implemented directly by LIPA staff and is open to all commercial new construction, renovation, and equipment replacement projects in the LIPA service territory. Program savings have come mostly from the largest energy users but have project distribution throughout all customer classes.

CCP includes three components: Prescriptive, Custom, and Whole Building:

The Prescriptive Component provides financial incentives to customers who purchase and install qualifying energy-efficient electric equipment; qualification is determined from a list of technologies that exceed both current code requirements and standard practices in the marketplace. The list comprises the most commonly installed and best understood equipment available: HVAC, lighting, motors, variable frequency equipment, HVAC controls, compressed air, commercial kitchen equipment, and vending machine controls. Unit savings are predetermined from engineering algorithms. Prescriptive incentive levels are pre-defined dollar amounts for pre-qualified electric energy-efficient equipment.

The Custom Component offers financial incentives and technical assistance to customers who install cost-effective energy-efficient equipment, and customers who design and install more comprehensive systems than those in the Prescriptive Component.

The Whole Building Component rewards participants with the greatest energy efficiency by encouraging building owners, developers, and architects to design and construct the most energy-efficient buildings--from the very beginning phase of construction projects.

The Whole Building Component differs from the Custom Component in the comprehensiveness of the savings. Whole Building incentives require the applicant to include at least three building systems, e.g., HVAC, lighting, building shell. The Whole Building Component provides incentives for all new construction and major renovation projects. Custom and Whole Building incentives are based on cost differences between a baseline technology or design, and more efficient ones. LIPA contracts with several Technical Assistance (TA) providers to perform energy modeling of interactive systems. TA contractors develop energy cost and savings that form the input for LIPA's project screening and analysis tool. All program incentives cover a percentage of the incremental cost difference between the base case and higher efficiency equipment relative to the associated program component.

CCP also provides the following:

- Technical assistance for Custom and Whole Building Projects
- Building Commissioning
- Incentives for LEED certification points related to energy

In 2007 LIPA introduced incentives for Commissioning and LEED Certified Buildings. LIPA's Commercial Construction Program offers developers and building owners the technical and financial assistance necessary to help meet LEED Green Building goals, beyond what is typically offered under the program. Whole building energy modeling, building commissioning, and financial incentives are available under this program—up to a total financial commitment per project of \$650,000 for a combined package of technical services and incentives..

LIPA's encourages building owners to include commissioning in their design and construction processes to ensure building energy systems perform at optimal levels. LIPA will fund up to 50% of the Commissioning costs related to energy conservation measures up to a maximum of \$50,000 per project.

## **PROGRAM PERFORMANCE**

Through 2006 LIPA has saved 129,854 MWh of energy and 25 MW of demand. LIPA has established more aggressive energy and demand goals for the next 5 years.

As part of CCP, LIPA has administered a Contractor Incentive program targeted to lighting/electrical, HVAC, general contractors and energy service companies (ESCOs) over the past three years. By offering an incentive equal to 5% of the customer's rebate, LIPA has encouraged contractors to assist their customers with completing and submitting the program application materials in a timelier manner. Through 2006, 259 participating contractors submitted 706 prescriptive rebate applications worth 19,285 MWh of energy and 5.1 Mw demand savings.

## **LESSONS LEARNED**

In 2000-2001 LIPA conducted an evaluation of the new commercial construction market to establish a baseline for implementation of commercial new construction, renovation, and equipment replacements on Long Island. Follow-up on-site inspections of newly constructed and renovated buildings, conducted in 2004, demonstrated the initial impacts of the program. A number of positive changes were observed:

- Considerable increases from the baseline in the use of metal halide lamps with electronic ballasts, in both the new construction and renovation markets.
- Considerable movement away from standard efficiency and toward the installation of high efficiency HVAC equipment in the renovation market.

- Significant increases in the installation of high efficiency motors in both the new construction and renovation markets.
- Considerable increases in the installation of variable frequency drives (VFDs) in the renovation market.
- Decision-makers for the buildings inventoried commonly cited LIPA influence as the reason for installing high efficiency equipment. For those decision-makers citing LIPA as an influence rebates were a factor in only a small portion of the lighting installations. On the other hand, for HVAC and motors, LIPA's influence was largely felt through rebates.

These follow-up studies indicated increased adoption of energy efficient practices and equipment with a significant level of influence attributed to LIPA. However, it is still too early to determine the extent to which these changes are likely to be sustainable.

In 2007 to make the program more cost-effective and maintain a targeted \$/kWh cost, LIPA implemented a financial incentive screening tool for determining Custom incentives. The analysis tool focuses more on the value of the future dollar savings of the installed energy efficient equipment rather than on the initial rebate. Additionally, the tool provides a variety of paths a customer can chose from to realize a project: return on investment, internal rate of return, interest rate buy-down, etc.

Recognition of program partners is an important element of CCP. LIPA recognizes and honors the outstanding contractors at an Annual LIPA Contractor Breakfast Awards ceremony.

Outreach and education are also key elements of CCP. Towards this objective LIPA published two resource guides in 2006:

- *High Performance Design Guide to Energy Efficient Buildings:* This publication was developed to help architects, designers, and building owners create more energy efficient commercial buildings on Long Island and the Northeast region. This reference book contains a “self-designed” activity that if completed qualifies for AIA/CES Learning Credits
- *Commissioning for Better Buildings on Long Island:* This publication promotes the benefits of building commissioning, how to start the process, and a step-by-step approach to implementing the building commissioning process. Again, this publication is targeted to architects, engineers, building owners, and developers. LIPA is committed to the idea of building commissioning and provides enhanced financial incentives for customers who choose to commission their buildings.

## PROGRAM AT A GLANCE

**Program Name:** Commercial New Construction Program

**Targeted Customer Segment:** Commercial and industrial customers

**Program Start Date:** 2000-1

**Program Participants:** Through 2006 – 3,401 applications received.

***Separate Components (applications):***

C/I Geothermal – 545

Cooling – Prescriptive – 3,889

Lighting – Prescriptive – 275,328

Motors and VFDs – 1,295

Custom Component – 531

Whole Building – 14

**Annual Energy Savings Achieved:** 130 GWh  
cumulative impact through 2006

**Peak Demand (summer) Savings Achieved:** 25  
MW cumulative impact through 2006

**Other Measures of Program Results to Date:**

**Budget:** \$6.2 million in 2007

**Funding Sources:** LIPA Clean Energy Initiative  
(ratepayer funding)

**Best Person to Contact for Information about the Program**

- Stacey Wagner
- Phone: 631-755-5358
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*Commercial/Industrial New Construction Programs  
Honorable Mention*

***WorkPlace New Construction Program  
Vermont Gas Systems, Inc.***

**PROGRAM OVERVIEW**

The WorkPlace New Construction Program is designed to reduce natural gas consumption and peak-day demand by encouraging commercial and industrial building owners to incorporate cost-effective natural gas savings measures in both the design and construction of new buildings and in the expansion, renovation or remodeling of existing buildings.

Vermont Gas Systems, Inc. (VGS) provides customer with a review of the building plans and, as needed, energy analysis of potentially cost-effective natural gas savings measures. In addition, VGS supplies customers and/or their design teams with energy-efficient equipment information, technical assistance, lists of manufacturers, and information about improved construction techniques and building materials.

VGS provides technical assistance to customers needing Vermont Act 250 (legislation that establishes requirements for energy-efficient construction, detailed in the document, *2005 Vermont Guidelines for Energy Efficient Commercial Construction*) who have chosen natural gas a heating fuel choice. This technical assistance may include a plan review and life cycle cost analysis. VGS actively assists customers in their efforts to comply with the Act 250 permit criteria and strongly encourages them to exceed these minimum requirements. For natural gas savings measures that exceed baseline requirements, VGS may also provide financial incentives. Occasionally VGS may provide incentives up to 50% of the incremental costs of measures. These higher incentive levels are reserved for measures that may be new to the marketplace and may pose some reliability risks to users. Higher incentives may also be offered for measures that incorporate cutting edge technology and are relatively untested in VGS service territory.

For projects not requiring Act 250 permits, VGS may provide incentives to developers or building owners up to 50% of the incremental costs of installing cost-effective natural gas savings measures. Incentives may be negotiated on a case by case basis.

Baseline savings estimates for new construction projects are based on local, state and/or federal energy construction codes; primarily Vermont Act 250 requirements and ASHRAE 90.1-2004 guidelines.

VGS coordinates services offered with other energy efficiency programs in Vermont, primarily those offered by the City of Burlington and the statewide Efficiency Vermont (EVT) programs. VGS routinely recommends that customers in the City of Burlington contact Burlington Electric Department (BED) for additional energy efficiency assistance and eligible services. VGS also will contact BED on behalf of its customers and also often works together with BED on joint projects, sharing information and meeting jointly with customers. VGS also refers customers to

Efficiency Vermont when projects are outside the City of Burlington and often works closely with Efficiency Vermont to provide customers with a full range of energy efficiency assistance for both natural gas and electric applications. Such efforts include meeting jointly with customers, sharing plans and specifications, and coordinating rebate offers.

## **PROGRAM PERFORMANCE**

Program completed 23 projects in 2006 with an achieved savings of 6,784 Mcf. Expenditures for incentives and overhead cost for the program totaled \$139,167. A number of these projects were completed by VGS's large key account customers, many of whom are still new to the program.

## **LESSONS LEARNED**

VGS has continued to explore opportunities to share costs with Efficiency Vermont and Burlington Electric Department for related services that promote and sustain energy-efficient buildings, including commissioning and third part energy analyses. For example, VGS is working with a number of customers interested in LEED certification for their new construction projects. VGS has met with owners and their design teams, along with staff of Efficiency Vermont and BED as applicable, to promote LEED certification and educate customers on its value as it relates to energy efficiency.

VGS has worked closely with other stakeholders in the roll-out of the *2005 Vermont Guidelines for Energy Efficient Commercial Construction*. In continued support VGS personnel continue to interact and communicate with the design/construction community to answer questions regarding meeting new requirements as laid out in these guidelines. VGS also provides feedback to the Department of Public Service, Energy Efficiency Division, which is responsible for administering these guidelines.

VGS's key account representatives play important roles in encouraging larger commercial and industrial customers and schools to take advantage of VGS programs, such as WorkPlace New Construction. Other marketing efforts have included outreach at events such as the Vermont Business and Industry Expo, Association of Facilities Engineers Expo, Better Buildings by Design Conference, and the Vermont Home and Garden Show. VGS also meets regularly with various mechanical contractors, consulting engineers and architectural firms to introduce the WorkPlace programs (others in addition to New Construction) and invite their participation in referring projects to VGS for DSM program screening.

Coordination and cooperation with BED and EVT has been critical in ensuring customers gain maximum benefits possible through both electric and natural gas energy efficiency.

## **PROGRAM AT A GLANCE**

**Program Name:** WorkPlace New Construction Program

**Targeted Customer Segment:** All commercial and industrial customers who are building new facilities

or substantially expanding, renovating or remodeling existing buildings and using natural gas for space, water and/or process energy needs.

**Program Start Date:** 1992

**Program Participants:** Program completed 26 projects in CY 2006. 273 projects have been completed since program inception after 477 project audits.

**Annual Energy Savings Achieved:** Projects achieved 6,784 Mcf for CY 2006. A grand total of 139, 336 Mcf have been saved since program inception.

**Peak Demand (winter) Savings Achieved:** 43.7 Mcf peak day savings were realized in CY 2006. 959 Mcf have been achieved since program inception.

**Other Measures of Program Results to Date:** Lifetime savings of the measures installed for CY 2006 equal 139,072. 2,869,107 since program inception.

**Budget:** CY 2006 budget \$220,459. Actual expenditures total \$139,072

**Funding Sources:** Utility ratepayers

**Best Person to Contact for Information about the Program**

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