

## Quick Start Energy Efficiency Programs

Developing a portfolio of cost-effective energy efficiency programs is a proven strategy for meeting growing energy demand. Energy efficiency program administrators typically start with a basic set of programs that are quick to get off the ground, offer measurable benefits in the near-term, and can be expanded to a broader and more comprehensive set of programs over a few years. A number of energy efficiency programs and portfolio development strategies, many which leverage the federal ENERGY STAR program, have proven to be effective in delivering measurable near-term benefits while simultaneously positioning program administrators to capture additional savings moving forward. Such programs include:

### Residential Sector

- Promoting the purchase of ENERGY STAR qualifying lighting and appliances in the residential sector through existing supply channels with financial incentives for some products, coupled with education and outreach on the full suite of ENERGY STAR qualifying products for the home to consumers, retailers, and equipment suppliers.
- Promoting retirement and recycling of old and inefficient appliances such as refrigerators, freezers, and room air conditioners through turn-in incentive programs.
- Promoting proper functioning of existing residential heating, ventilating, and air conditioning (HVAC) equipment, as well as proper sizing and installation of new equipment.
- Developing pilot-scale initiatives to promote comprehensive home energy improvements for existing homes through Home Performance with ENERGY STAR.
- Developing pilot-scale initiatives to promote the construction of ENERGY STAR qualified new homes (both site built and manufactured) through builder networks.

### Commercial Sector

- Offering prescriptive incentives for lighting and HVAC measures to a broad range of commercial facilities along with education and/or technical assistance to promote increased energy efficiency in lighting and HVAC system design.
- Offering prescriptive incentives to promote the purchase of ENERGY STAR qualifying commercial food service equipment for use in restaurants, hotels/hospitality venues, schools, and other applicable commercial or institutional facilities.
- Developing pilot-scale initiatives to facilitate whole-building energy performance using the ENERGY STAR building performance rating system, coupled with incentives for energy efficient lighting and HVAC systems, and general education about building tune-ups and/or retrocommissioning to improve building operation and maintenance.
- Promoting power management of computer monitors through direct outreach to large end users and online tools for smaller end users, along with education about additional opportunities for saving energy through purchase and proper use of ENERGY STAR qualifying office products.

## Overview of Early Energy Efficiency Program Design<sup>1</sup>

The initial approach taken by a program administrator will depend on how quickly the program needs to ramp up to meet regulatory or other requirements, and on the availability of service industry professionals who know how to plan for, and deliver, energy efficiency to the marketplace. A sample of how energy efficiency program approaches may evolve over time is presented in Figure 1.

Figure 1: Sample Progression of Program Designs

| SECTOR                                 | PROGRAM RAMP UP  |   |   |
|--|--|---|---|
|  | EARLY (6 MONTHS-2 YRS)   | MIDTERM (2-3 YRS)   | LONGER TERM (3 to 7 YRS)  |
| <b>Residential – existing homes</b>    | Market-based ENERGY STAR lighting & appliance program  | Continue market-based ENERGY STAR lighting & appliance program  | Continue market based ENERGY STAR lighting & appliance program. Increase efficiency levels/refocus technologies as needed |
|  |  | Expand outreach for hard-to-reach market segment (low income, multifamily, affordable housing)                      | Continue hard-to-reach program components   |
|  | Refrigerator/freezer recycling program   | Continue recycling program. Add incentives for ENERGY STAR qualified replacement appliance                          | Continue appliance recycling program. Add incentives for ENERGY STAR qualified replacement appliance                      |
|  | Pilot residential HVAC diagnostics and installation program  | Full-scale residential HVAC diagnostics and installation program  | Continue ENERGY STAR residential HVAC diagnostics and installation program  |
|  | Pilot Home Performance with ENERGY STAR  | Expand Home Performance with ENERGY STAR pilot  | Full-scale Home Performance with ENERGY STAR program  |
| <b>Residential – new construction</b>  | ENERGY STAR Homes pilot (in areas w/out existing infrastructure)   | Full-scale ENERGY STAR Homes program  | Add incentives for ENERGY STAR Advanced Lighting Package and Indoor Air Package   |
| <b>Commercial – existing buildings</b> | Sector-based education on whole building energy management and benchmarking using the EPA energy performance rating                              | Sector-based education on whole building energy management and benchmarking using the EPA energy performance rating |   |
|  | Prescriptive rebates for lighting and HVAC measures across a range of commercial facilities; specify ENERGY STAR qualifying products as relevant | Custom rebates based on assessment of whole building and/or portfolio of buildings                                  | Refine incentives to reward comprehensive whole building upgrades   |
|  |  | Incentives for improved operations and maintenance and/or retrocommissioning  | Continue incentives for improved operations and maintenance and/or retrocommissioning                                     |
| <b>Commercial – food service</b>       | Prescriptive rebates for ENERGY STAR qualifying food service equipment   | Pilot custom rebates for whole-kitchen efficiency projects (remodeling or new construction)                         | Expand whole kitchen efficiency program   |
| <b>Commercial – new construction</b>   | Education and training on ENERGY STAR Design Guidance, setting energy performance targets, and High Performance Buildings                        | Integrate Design Guidance with incentives and design assistance   | Continue design assistance, and promote continuous tracking of energy performance   |

As the above table illustrates, program administrators typically start with proven models and simple implementation approaches that minimize burdens on program participants, such as offering prescriptive rebates for the purchase of energy efficient technologies. Such programs are typically offered across

<sup>1</sup> Adapted from the *National Action Plan for Energy Efficiency: Chapter 6, Energy Efficiency Program Best Practices*. (2006).

broad customer classes, such as existing buildings in the residential and commercial sectors. For more complex and targeted initiatives—such as programs promoting energy efficient new construction or whole building energy performance in existing buildings—including small-scale pilot programs in the initial portfolio is an effective strategy for minimizing risk, while allowing program administrators to test market conditions, establish relationships with key trade allies, and gain the experience needed to optimize implementation processes and procedures. In later years, these pilot programs can be expanded to full-scale initiatives that provide a more effective mechanism for securing long-term energy savings than measure-based incentives.

The early years of program implementation are critical to establishing the necessary internal relationships—across key departments such as customer service, marketing, and technical personnel—and external relationships—between program administrators, trade allies, regulators, and other stakeholders—to ensure program success. Simple and straightforward programs will help establish trust, develop familiarity with program processes and procedures, and facilitate a better understanding of roles and relationships between program administrators and other market actors.

As energy efficiency program administrators gain internal experience and a greater understanding of local market conditions, and regulators and stakeholders gain greater confidence in the value of the energy efficiency programs being offered, program administrators can increase the complexity of the programs provided and technologies addressed. Additional complexity can include alternative financing approaches (e.g., performance contracting), the inclusion of custom incentives for savings associated with more complex projects that may include multiple energy efficiency upgrades, bidding programs, expanded whole building and whole home approaches, or new cutting edge technologies. In addition, once programs are proven within a broad end use sector, they can often be modified to meet the needs of targeted subsectors. For example, proven residential program offerings can be tailored to address the needs of multifamily or low-income customers, and broad commercial offerings can be adapted to serve small businesses or multifamily applications.

## Residential Opportunities

### Promoting ENERGY STAR® Qualifying Residential Lighting and Appliance Products

#### Lighting

ENERGY STAR qualifying lighting offers a significant and highly cost-effective opportunity for increasing residential energy efficiency, as lighting consistently emerges as a dominant technology with high energy savings potential in the residential sector. The Northeast, Northwest, and California report lighting to be the single largest energy savings opportunity in their respective regions. In addition, residential lighting energy consumption is expected to increase about 1.4 percent per year through 2025<sup>2</sup> due to the escalating number of light sources per home, increasing square footage of households, and the growth in new home construction in the United States. In 2007, an estimated 1.5 million homes will be constructed nationwide,<sup>3</sup> with 20 to 30 hardwired fixtures per home.<sup>4</sup>

ENERGY STAR qualifying lighting products are making great strides in the marketplace. For customers replacing burned out bulbs in existing fixtures, ENERGY STAR qualifying compact fluorescent light (CFL) bulbs are widely available throughout the United States. And as homes are built, remodeled, and renovated, an increasing array of stylish ENERGY STAR qualifying light fixtures can lock in energy savings for years to come.

Major program elements typically employed by energy efficiency program administrators include:

- Consumer marketing, outreach, and education including coordination with the national ENERGY STAR *Change a Light, Change the World Campaign* that occurs each fall.



<sup>2</sup> U.S. Department of Energy, Energy Information Administration, *Annual Energy Outlook*. (2004).

<sup>3</sup> National Association of Home Builders (NAHB), *Housing and Interest Rate Forecas.t* (2003-2007). Available at: <http://www.nahb.org/generic.aspx?genericContentID=631>.

<sup>4</sup> Atkinson, B.; Denver, A.; Koomey, J.; Moezzi, M.; Shown, L.; and Vorsatz, D., Lawrence Berkeley National Laboratory, *Lighting Market Sourcebook for the U.S.* (1997).

- Outreach and training to retailers and other major distribution channels (e.g., big box retailers, local retailers, grocery and hardware stores, lighting showrooms, electrical distributors, home builders) to support promotion of ENERGY STAR qualifying lighting products.
- Cooperative marketing incentives whereby manufacturers team up with retailers to promote ENERGY STAR qualifying lighting in a way that is compatible with their business model. Opportunities are usually bid through a request for proposal process (RFP) and require sales data/results be provided to the energy efficiency program administrator in order for payments to be received.<sup>5</sup> Manufacturers and retailers often contribute in-kind resources. Proposals range from upstream buy downs, product mark downs, point of sale discount coupons, and consumer rebates, to creation of lighting bays or specialized promotions.
- Coordination with other energy efficiency program administrators including utilities, government agencies, and regional energy efficiency organizations. Proper coordination ensures program consistency across a broader geographic region, also increasing program effectiveness by creating greater incentives for manufacturers and retailers to participate.

Programs that are on particularly aggressive timelines for implementation have outsourced program implementation to contracting firms that have experience in implementing effective programs for other energy efficiency program sponsors throughout the country. Lighting programs can be administered for a levelized cost of conserved energy (CCE) between \$0.01 and \$0.03/kWh,<sup>6</sup> with scores ranging from 1.6 to 3.5 on the total resource cost (TRC) test.<sup>7</sup>

### *Appliances and Other Products*

ENERGY STAR qualifying clothes washers represent another cost-effective opportunity to promote energy efficiency and also reduce water consumption. To meet new ENERGY STAR criteria which came into effect on January 1, 2007, clothes washers must be at least 37 percent more energy efficient than the federal standard, and must also meet stringent water efficiency criteria. For energy efficiency program administrators that evaluate programs using the societal version of the TRC test, factoring water savings into benefit-cost calculations can further improve cost-effectiveness results.

Energy savings in the residential sector can also be achieved by promoting many other ENERGY STAR qualifying products including other appliances (refrigerators and freezers, dehumidifiers, and room air conditioners), consumer electronics, and computers. A specification for ENERGY STAR qualifying residential water heaters is also being developed. As these products are also sold through retail channels, energy efficiency program administrators may consider offering retailer education and training to promote the full suite of ENERGY STAR products in relevant retail channels. Such an approach seeks to fully engage retail partners and avoid lost opportunities by cross-selling a bundle of ENERGY STAR qualifying products.

### *Resources for Additional Information*

ENERGY STAR resources:

- ENERGY STAR Web site: <http://www.energystar.gov/>.
- National campaigns promoting ENERGY STAR qualified products: [http://www.energystar.gov/index.cfm?c=promotions.pt\\_national\\_promotions](http://www.energystar.gov/index.cfm?c=promotions.pt_national_promotions).
- ENERGY STAR Change a Light campaign: [http://www.energystar.gov/index.cfm?c=change\\_light.changealight\\_index](http://www.energystar.gov/index.cfm?c=change_light.changealight_index).
- Information on ENERGY STAR product specification development: [http://energystar.gov/index.cfm?c=prod\\_development.prod\\_development\\_index](http://energystar.gov/index.cfm?c=prod_development.prod_development_index).

<sup>5</sup> This model requires agreement between the oversight authority and program administrator on acceptable monitoring and evaluation criteria.

<sup>6</sup> EPA estimates levelized CCE based on data from California IOUs, Efficiency Vermont, National Grid, Wisconsin Focus on Energy, and United Illuminating. Programs encompass both CFLs and fixtures, and achieve levelized costs that are similar to programs with CFLs alone.

<sup>7</sup> Quantum Consulting, *National Energy Efficiency Best Practices Report, Volume R1 – Residential Lighting Best Practices Report*. (2004).

Example programs from ENERGY STAR partners:

- Midwest Energy Efficiency Alliance Change a Light, Change the World Campaign 2006: [http://mwalliance.org/program\\_page.php?page=Change%20A%20Light,%20Change%20The%20World%202006](http://mwalliance.org/program_page.php?page=Change%20A%20Light,%20Change%20The%20World%202006).
- Wisconsin Focus on Energy Cash-Back Rewards for Lighting and Appliances: <http://www.focusonenergy.com/page.jsp?pagelid=647&>.

Publications and other resources:

- Quantum Consulting, *National Energy Efficiency Best Practices Study. Volume R1-Residential Lighting Best Practices Report*: [http://www.eebestpractices.com/pdf/BP\\_R1.PDF](http://www.eebestpractices.com/pdf/BP_R1.PDF).
- Southwest Energy Efficiency Alliance, *Policies and Programs for Increasing the Adoption of High-Efficiency Lighting in Homes in the Southwest*: [http://www.swenergy.org/pubs/Lighting\\_Policy\\_Report.pdf](http://www.swenergy.org/pubs/Lighting_Policy_Report.pdf).
- Midwest Energy Efficiency Alliance, *The Illinois Residential ENERGY STAR Lighting Program: Final Report to the Illinois Department of Economic Opportunity*: [http://www.mwalliance.org/image/docs/page/Final%20Report\\_IL%20Res%20Light.pdf](http://www.mwalliance.org/image/docs/page/Final%20Report_IL%20Res%20Light.pdf).
- Itron, Inc., *SDG&E Hard-to-Reach Lighting Turn-In Program*, program evaluation: [http://calmac.org/publications/SDGEHTRLightingFinal\\_03012006ES.pdf](http://calmac.org/publications/SDGEHTRLightingFinal_03012006ES.pdf).

## Promoting Retirement and Recycling of Old Refrigerators/Freezers

Of the existing stock of refrigerators in U.S. homes, approximately 25% (31 million) were manufactured before minimum efficiency standards took effect in 1993.<sup>8</sup> Promoting the retirement and recycling of old, inefficient refrigerators or freezers through a turn-in incentive program is a straightforward model for achieving cost-effective energy savings. Programs typically offer a turn-in incentive (averaging around \$35 for refrigerators) and cost-free pickup of the functioning older appliance. A recent review of refrigerator recycling programs suggests that in the early years of a program, most participants will be retiring (and not replacing) secondary models, while in later years of implementation a higher percentage of participants will be replacing primary equipment.<sup>9</sup> Thus, education and incentives to promote the purchase of ENERGY STAR qualifying new equipment may be beneficial for long-standing programs—new ENERGY STAR qualifying refrigerators use less energy than a 75-watt light bulb.

Major program elements typically employed by energy efficiency program administrators include:

- Consumer education on the cost of keeping a second refrigerator or freezer in their basement or garage, as well as education on replacing primary refrigerators that were manufactured before 1993.
- Simplified program administration by contracting with a national or regional appliance recycling company to provide turnkey implementation services (eligibility verification, appointment scheduling, appliance pickup, recycling and disposal, and incentive processing).
- Specification of key eligibility criteria such as appliance size, age (some programs specify that refrigerators must be models produced before 1993 efficiency standards took effect), and requirements that units are functioning at the time of pick up. Consumers should be informed that they will be charged a fee to recycle equipment that is not functioning.
- Pickup of old equipment to ensure proper recycling and disposal, with some programs requiring that recycling contractors incinerate foam insulation to prevent the release of chlorofluorocarbons (CFCs).

In addition, programs may wish to work with major appliance retailers to offer an incentive for retirement and recycling of refrigerators when new appliances are delivered to ensure that older refrigerators do not become second refrigerators or are not sold through resale markets.

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<sup>8</sup> U.S. Department of Energy: Energy Efficiency and Renewable Energy, "Emerging Technologies: Appliance Research and Development." [www.eere.energy.gov/buildings/tech/appliances](http://www.eere.energy.gov/buildings/tech/appliances)

<sup>9</sup> eSource, *Refrigerator Recycling Programs: Rounding up the Old Dogs for Easy Energy Savings*. (2006).

Refrigerator recycling programs can be administered for a levelized CCE between \$0.03 and \$0.05/kWh.<sup>10</sup> In general, levelized CCE is lower in the early years of program implementation when there is a higher percentage of retired secondary units that are not replaced. Long-running programs like Southern California Edison's have shown a gradual decline in cost-effectiveness as the average age of collected refrigerators decreases and the percentage of units being replaced increases.<sup>11</sup>

### *Resources for Additional Information*

ENERGY STAR Resources:

- ENERGY STAR Appliance Promotions: Refrigerator Retirement (July-September): [http://www.energystar.gov/index.cfm?c=appliance\\_cmpgn.appliance\\_cmpgn](http://www.energystar.gov/index.cfm?c=appliance_cmpgn.appliance_cmpgn).
- ENERGY STAR Refrigerator Retirement Savings Calculator: <http://www.energystar.gov/index.cfm?fuseaction=refrig.calculator>.
- ENERGY STAR Refrigerators: 2007 Partner Resource Guide: [http://www.energystar.gov/ia/partners/manuf\\_res/downloads/2007Refrigerator\\_prg.pdf](http://www.energystar.gov/ia/partners/manuf_res/downloads/2007Refrigerator_prg.pdf).

Example programs from ENERGY STAR partners:

- Alliant Energy Appliance Recycling Program: <http://www.alliantenergy.com/docs/groups/public/documents/pub/p014680.hcsp>.
- Ameren Refrigerator Rebate and Recycling Program implemented by the Midwest Energy Efficiency Alliance: [http://www.mwalliance.org/program\\_page.php?page=Refrigerator%20Rebate%20and%20Recycling%20Program](http://www.mwalliance.org/program_page.php?page=Refrigerator%20Rebate%20and%20Recycling%20Program).
- Commonwealth Edison Room Air Conditioner Exchange and Recycling Program implemented by the Midwest Energy Efficiency Alliance: [http://www.mwalliance.org/program\\_page.php?page=Room%20Air%20Conditioner%20Exchange%20and%20Recycling%20Program](http://www.mwalliance.org/program_page.php?page=Room%20Air%20Conditioner%20Exchange%20and%20Recycling%20Program).
- Southern California Edison Refrigerator & Freezer Recycling Program: <http://www.sce.com/RebatesandSavings/Residential/Appliances/RefrigeratorandFreezerRecycling/>.

Publications and other resources:

- American Council for an Energy Efficient Economy (ACEEE), *America's Best: Profiles of America's Leading Energy Efficiency Programs*, profile of Sacramento Municipal Utility District's Exemplary Residential Appliance Recycling Program: <http://www.aceee.org/utility/4brefrigrecylingsacramentca.pdf>.

### Promoting Residential HVAC Diagnostics and Improvement

HVAC systems represent another substantial opportunity for residential energy savings and demand reduction, and programs targeting HVAC systems are frequently included as a basic element of energy efficiency portfolios. Where product rebate programs promote the purchase of energy efficient new equipment, HVAC diagnostics and improvement programs promote proper functioning of existing equipment as well as proper sizing and installation of new equipment. With the increase in federal efficiency standards for central air conditioning (AC) systems, best practice for energy efficiency programs is rapidly evolving toward a focus on proper sizing, installation, charge and airflow for both new and existing systems.

Major program elements typically employed by energy efficiency program administrators include:

- Recruiting and registering trade allies such as HVAC contractors to provide services that are eligible for incentives.

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<sup>10</sup> eSource estimates are based on data from Fort Collins Utilities, Nevada Power, Sacramento Municipal Utility District, Southern California Edison, and Utah Power.

<sup>11</sup> eSource, *Refrigerator Recycling Programs: Rounding up the Old Dogs for Easy Energy Savings*. (2006).

- Requiring contractors to participate in training sessions and providing materials to support their marketing efforts (letter templates, brochures, program sponsor logos, and other customizable marketing materials).
- Trade ally incentives to buy down the cost of the service for the end-user.
- Oversight by the program administrator to ensure quality control.

Central AC maintenance programs report a levelized CCE between \$0.03 and \$0.04/kWh.<sup>12</sup> Programs are most cost-effective in warm climates where high equipment usage produces larger energy savings, and where there is a high market saturation of central AC systems.

### *Resources for Additional Information*

ENERGY STAR Resources:

- ENERGY STAR information and tips on energy efficient heating and cooling in the home: [http://www.energystar.gov/index.cfm?c=heat\\_cool.pr\\_hvac](http://www.energystar.gov/index.cfm?c=heat_cool.pr_hvac).

Example programs from ENERGY STAR partners:

- Nevada Power Air Conditioning Incentives for HVAC Contractors: [http://www.nevadapower.com/conservation/business/business\\_rebates/efficientAC\\_contractor.cfm](http://www.nevadapower.com/conservation/business/business_rebates/efficientAC_contractor.cfm).

Publications and other resources:

- ACEEE, *America's Best: Profiles of America's Leading Energy Efficiency Programs*, profile of Proctor Engineering Group CheckMe! Program: <http://aceee.org/utility/2cckmeprocen.pdf>.
- Consortium for Energy Efficiency (CEE) Residential HVAC Installation Specification Web site: <http://www.cee1.org/resid/rs-ac/hvac.php3>.

### *Piloting Home Performance with ENERGY STAR*

In addition to the relatively straightforward, rapid startup residential programs discussed above, administrators of new energy efficiency portfolios may also consider including one or two pilot initiatives of more complex but well-tested program models targeting the residential sector. Energy efficiency program administrators have found pilot-scale implementation of Home Performance with ENERGY STAR to be an effective way to deliver exponentially larger energy savings over the longer term by investing in infrastructure and program development in the near term.

Home Performance with ENERGY STAR is an innovative program that goes beyond basic product incentives and seeks to capture the significant savings potential of improving whole-house energy performance in the existing housing market. The program is especially timely as product efficiency standards are increasing and there is less savings potential from single-product rebate strategies. The program is based on a whole-house assessment of energy efficiency savings opportunities, but it goes beyond a typical audit program, since the contractor who performs the assessment is prepared to offer comprehensive services to complete recommended improvements. Home Performance with ENERGY STAR can be a cost-effective addition to an energy efficiency program portfolio and deliver on customer needs to manage energy costs and improve the health, comfort and safety of their homes. The opportunity for improving this marketplace is significant: in 2005, the average age of an American home was 32, implying that more than half of the over 66 million single-family homes in the United States were constructed before modern energy codes existed.<sup>13</sup> Many of these homes have no wall insulation, high levels of air infiltration, inefficient heating and air conditioning, as well as inefficient water heaters and appliances.

Major program elements typically employed by energy efficiency program administrators include:

- Working with trade allies to train and develop a contracting industry capable of delivering whole house energy improvement services.

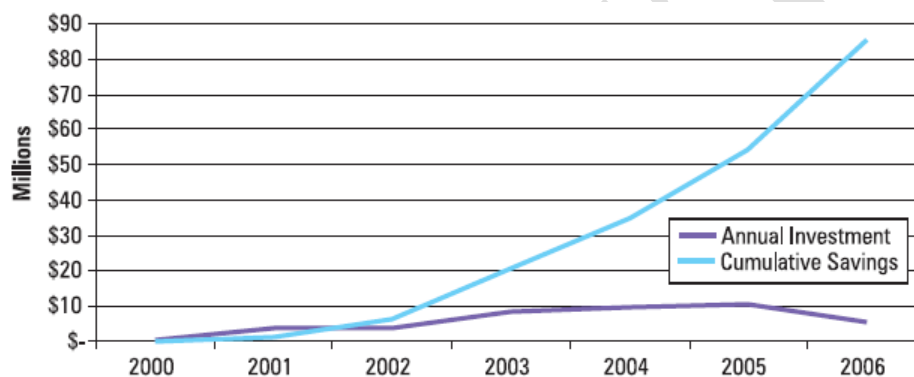
<sup>12</sup> EPA estimates levelized CCE based on data from PG&E.

<sup>13</sup> Harvard University, Joint Center for Housing Studies, *The Changing Structure of the Home Remodeling Industry*. (2005).

- Offering consumer financing and/or incentives to overcome barriers related to the up-front cost of improvements.
- Marketing and media activities to educate consumers about energy efficiency opportunities and incentives.
- Quality assurance and oversight by the program administrator to ensure contractors are delivering on energy performance.

Developing program infrastructure by building a network of qualified professionals to deliver whole-house efficiency services requires substantial resources during the first year. This is one reason many program administrators choose to start with a pilot in a target market, allowing flexibility to work out the details of efficient program design and delivery. Once the infrastructure is established in the pilot market, the investment to maintain and expand the program decreases and savings increase, as shown in the New York State Energy Research and Development Authority (NYSERDA) example in Figure 3 below.

Figure 3: New York Home Performance with ENERGY STAR Program Investment and Customer Savings (15 year life cycle)



For mature programs, cost effectiveness estimates indicate that Home Performance with ENERGY STAR has a levelized cost of conserved energy about \$0.05 /kWh.<sup>14</sup> Typical home performance improvements will deliver electricity savings as well as heating fuel savings, so programs that can account for both gas and electric savings score even higher on cost effectiveness tests.

### Resources for Additional Information

ENERGY STAR Resources:

- Home Performance with ENERGY STAR Web site: <http://www.energystar.gov/hpwebsitesponsors>.

Example programs from ENERGY STAR partners:

- Austin Energy Home Performance with ENERGY STAR: <http://www.austinenergy.com/Energy%20Efficiency/Programs/Rebates/Residential/Home%20Performance%20with%20Energy%20Star/index.htm>.
- Wisconsin Focus on Energy Home Performance with ENERGY STAR: <http://www.focusonenergy.com/page.jsp?pageId=25>.
- NYSERDA Home Performance with ENERGY STAR: <http://www.getenergysmart.org/WhereYouLive/HomePerformance/overview.asp>.

### Promoting Construction of ENERGY STAR Qualified New Homes

Every year more than 1.7 million new single family new homes are constructed in the United States, with life expectancies of 50 to 100 years. A huge opportunity for persistent energy and peak demand savings is lost if these homes are not designed to be energy efficient, as many energy-saving features cannot be added cost-effectively after a home is built. A new portfolio of energy efficiency programs may include a

<sup>14</sup> EPA estimates based on data from Austin Energy.

pilot initiative to promote ENERGY STAR qualified new home construction in order to lay the groundwork for long-term energy savings and peak demand reduction.

ENERGY STAR makes it easy for homebuyers to select homes that are approximately 15 to 20 percent more efficient than prevailing energy code requirements and are verified by an independent third-party certification process. For builders, ENERGY STAR provides a widely recognized label of excellence that distinguishes the energy performance of their homes and helps reduce liability through the increased rigor of the energy efficiency measures and additional subcontractor oversight. For energy efficiency program administrators, promoting construction of ENERGY STAR qualified homes provides an effective way to lock in energy savings for the long term and ensure that opportunities for capturing energy savings are not missed. Such programs can be a cost-effective addition to an energy efficiency portfolio that delivers on home owner needs to reduce energy costs and improve the health, comfort and durability of their homes, while simultaneously reducing peak demand (each home built to ENERGY STAR performance levels can reduce peak demand by approximately 1 kW).

Major program elements typically employed by energy efficiency program administrators include:

- Extensive builder outreach—including recruitment, education and training, tools, marketing support, and technical assistance—to communicate the benefits of energy efficient homes.
- Direct incentives to raters aimed at increasing Home Energy Rating System (HERS) verification infrastructure.<sup>15</sup>
- Co-operative marketing incentives to increase builder participation in lieu of direct incentives to offset increased construction costs. (Co-operative marketing helps builders sell homes and reinforces the message that they will recoup their expenditures by differentiating themselves from the competition and selling higher-quality, higher-priced homes).
- Outreach to other home industry professionals such as realtors.
- Quality assurance and oversight by the energy efficiency program administrator.
- Incentives for the ENERGY STAR Advanced Lighting Package and the ENERGY STAR Indoor Air Package to achieve additional cost-effective energy savings.

Timelines for ramp up and full-scale implementation are typically determined in consultation with the local homebuilding industry. Today, the strongest candidates for energy efficiency program sponsorship are markets where a network of home energy raters is growing or have HERS networks in neighboring states (the HERS rating network has experienced strong growth nationally in recent years). An administrator should also consider local building energy codes and discuss plans with builders and other market actors that have been exposed to ENERGY STAR business strategies to ensure proper infrastructure development.

Various electric utilities have reported that their investment in ENERGY STAR qualified homes yielded a levelized CCE between \$0.02 and \$0.08/kWh. However, as ENERGY STAR qualified homes deliver both electricity savings and heating fuel savings, the cost-effectiveness will be even higher for programs with integrated electric and gas savings. In many markets, strong market penetration of ENERGY STAR qualified new homes has increased market penetration of tight duct work, reduced the cost and increased the availability of high-performance windows, and increased market penetration of high-efficiency heating and cooling equipment.

### *Resources for Additional Information*

ENERGY STAR Resources:

- ENERGY STAR New Homes Web site:  
[http://energystar.gov/index.cfm?c=new\\_homes.hm\\_index/](http://energystar.gov/index.cfm?c=new_homes.hm_index/).
- ENERGY STAR New Homes partner locator, including HERS raters and builders in each state:  
[http://energystar.gov/index.cfm?fuseaction=new\\_homes\\_partners.showHomesSearch](http://energystar.gov/index.cfm?fuseaction=new_homes_partners.showHomesSearch).

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<sup>15</sup> Additional information on HERS rating is available on the RESNET Web site: <http://www.natresnet.org/>.

- Features of an ENERGY STAR New Home:  
[http://www.energystar.gov/index.cfm?c=new\\_homes.nh\\_features](http://www.energystar.gov/index.cfm?c=new_homes.nh_features).

Example programs from ENERGY STAR partners:

- Focus on Energy Wisconsin ENERGY STAR Homes Program:  
<http://www.focusonenergy.com/page.jsp?pageId=26>.
- Northwest Energy Efficiency Alliance ENERGY STAR Homes Program:  
<http://www.northwestenergystar.com/index.php?cID=132>.
- NYSERDA New York ENERGY STAR Labeled Homes Program:  
<http://www.getenergysmart.org/WhereYouLive/ENERGYSTARNewHomes/overview.asp>.

## Commercial Opportunities

### Promoting Efficient Commercial Lighting and Cooling

Lighting represents a significant portion of a commercial building's electricity bill, consuming about 23 percent of electricity in commercial buildings<sup>16</sup> and is a primary source of heat gain and waste heat. On average, cooling accounts for about 26 percent of electricity use in commercial buildings<sup>17</sup> and an even larger percentage in warm climates. The energy consumption of these two end uses can be greatly reduced through energy efficient technologies, proper design, and a systems-based approach to improving energy performance. Offices, retail spaces, warehouses, and schools are the largest consumers of commercial lighting and HVAC electricity on a national basis and are likely to be strong initial targets for commercial retrofit programs.

Prescriptive incentive programs are a proven strategy for capturing lighting and cooling savings across a range of non-residential sectors (commercial, industrial, and institutional). Such programs offer pre-determined incentives for a range of common energy efficiency measures for which per-measure energy savings can be readily estimated. To maximize market impact, prescriptive programs are typically trade ally-driven, and may involve manufacturers, vendors, equipment installers, and retailers. Such programs minimize barriers to participation through simple application processes and rapid incentive processing. Due to their straightforward design and implementation approach, prescriptive incentive programs can also be ramped up quickly, and are the basic building blocks of virtually every energy efficiency program portfolio.

Major program elements typically employed by energy efficiency program administrators include:

- Prescriptive incentives that cover a portion of the incremental cost of installing a higher efficiency technology, with many programs setting incentive levels to ensure payback in one to two years.
- Incentive designs linked to ENERGY STAR specifications and performance thresholds, when available.
- Program marketing via trade allies such as lighting and HVAC vendors and contractors. Regular communication with trade allies allows program administrators to address issues as they arise and ensures allies are actively engaged in promoting the program. In some cases, trade ally incentives are offered to motivate sales of qualifying equipment.
- Additional marketing and outreach to end users conducted through business and industry trade associations, as well as direct solicitation by mail and telephone.
- Straightforward incentive application processes, with some utilities like Pacific Gas & Electric Company (PG&E) offering online rebate application and processing.
- Streamlined verification/quality control processes to facilitate ease of participation and minimize the time required for incentive payment.

<sup>16</sup> U.S. Department of Energy, Energy Information Administration, *Preliminary End-Use Consumption Estimates by Principal Building Activity Based on 1999 Commercial Buildings Energy Consumption Survey*.

<sup>17</sup> Ibid.

- Simple tools and calculators to help customers understand the benefits of investing in energy efficient technologies, and to help trade allies sell high efficiency products by clearly demonstrating payback period and lifetime savings benefits.
- Particularly for HVAC systems where proper sizing and installation greatly improves performance, a quality assurance plan helps to ensure proper design and installation. Proof of proper sizing may be required as a condition of the rebate. For packaged HVAC units used in smaller commercial applications, programs have developed clear quality assurance standards and provided on-site verification using a sampling approach to verify performance. For larger units, some programs offer commissioning assistance and incentives to ensure proper function.

Prescriptive commercial lighting and HVAC programs have been market-tested and proven to be cost-effective across the country. Prescriptive programs targeting commercial lighting report a levelized CCE between \$0.005 and \$0.02/kWh.<sup>18</sup> Prescriptive programs targeting commercial HVAC systems report a levelized CCE between \$0.01 and \$0.06/kWh.<sup>19</sup> As savings associated with HVAC systems are highly dependent on base usage levels, HVAC programs are more cost effective in severe climates than mild climates.

### Further Considerations

A multi-faceted program approach is typically needed to minimize lost opportunities for energy efficiency improvement in commercial lighting and HVAC systems. Prescriptive incentive programs fail to capture savings that are associated with more complex measures or with systems that include multiple technologies. For example, a facility that is evaluating equipment for a cooling system upgrade may not consider how implementing a lighting system upgrade would reduce cooling load and potentially allow for down-sizing of cooling equipment. A balanced energy efficiency portfolio will also include programs to promote more comprehensive assessments of facility energy use and cross-cutting energy efficiency opportunities. Proven models include custom incentive programs that offer a greater degree of technical assistance and incentives based on calculated energy savings and/or demand reduction. Design assistance programs offer similar mechanisms to promote energy efficient design and construction of commercial facilities (new construction or major renovations), and target trade allies such as architects, engineers, and contractors.

In addition, a broad prescriptive program may not be an effective mechanism for increasing energy efficiency across all commercial customer classes. Small businesses, not-for-profit organizations, and renters often face barriers to participation in efficiency programs that are more severe or complex than those addressed by mainstream program design. Some program administrators include specialized programs designed to target hard-to-reach customer segments where a specific delivery approach is needed to overcome market-specific participation barriers. Common approaches employed by such programs include higher incentive levels, on-bill financing mechanisms to help customers finance costs not covered by incentives, direct installation of low-cost measures like CFLs, and more aggressive, grassroots outreach strategies.

#### Lighting Best Practice Note

To promote optimal efficiency in commercial lighting design, some best practice programs employ incentives based on energy savings or demand reduction (per kWh or kW). Though prescriptive per-fixture incentive programs are simple to administer, they are less effective in promoting optimal lighting design (for example, they do not address energy savings that could be achieved through delamping). Though savings-based incentives increase administrative complexity (particularly in terms of measurement and verification requirements) such approaches seek to optimize energy use in a given space, enabling customers to achieve the benefits of improved lighting quality as well as energy savings.

To minimize lost opportunities and serve a broad range of end-users, a program administrator may choose to include prescriptive, custom, and targeted program elements in the initial energy efficiency

<sup>18</sup> Quantum Consulting, *National Energy Efficiency Best Practices Study, Volume NR1 – Nonresidential Lighting Best Practices Report*. (2004). EPA estimates based on data from Xcel Energy, California IOUs, and the Sacramento Municipal Utility District.

<sup>19</sup> Quantum Consulting, *National Energy Efficiency Best Practices Study, Volume NR2 – Nonresidential HVAC Best Practices Report*. (2004). EPA estimates based on data from the Los Angeles Department of Water & Power and the New England Energy Efficiency Partnership.

portfolio, or establish the necessary market presence with a prescriptive program before launching more complex program designs in subsequent years.

### *Resources for Additional Information*

ENERGY STAR resources:

- *ENERGY STAR Buildings Manual*, lighting chapter: [http://www.energystar.gov/ia/business/BUM\\_lighting.pdf](http://www.energystar.gov/ia/business/BUM_lighting.pdf).
- *ENERGY STAR Buildings Manual*, HVAC chapter: [http://www.energystar.gov/ia/business/BUM\\_heat\\_cool.pdf](http://www.energystar.gov/ia/business/BUM_heat_cool.pdf).
- ENERGY STAR Web site for light commercial heating and cooling: [http://www.energystar.gov/index.cfm?c=lchvac.pr\\_lchvac](http://www.energystar.gov/index.cfm?c=lchvac.pr_lchvac).
- Information on ENERGY STAR qualified LED exit signs: [http://www.energystar.gov/index.cfm?c=exit\\_signs.pr\\_exit\\_signs](http://www.energystar.gov/index.cfm?c=exit_signs.pr_exit_signs).

Example programs from ENERGY STAR partners:

- NYSERDA New York Small Commercial Lighting Program: <http://sclp.lightingresearch.org/>.
- Efficiency Vermont Lighting and HVAC Program: <http://www.encyvermont.com/pages/Business/HVAC/Lighting/>.
- PG&E Business Rebates and Incentives: [http://www.pge.com/biz/rebates/rebates\\_assistance/](http://www.pge.com/biz/rebates/rebates_assistance/).

Publications and other resources:

- National Electrical Manufacturers Association (NEMA) lamp recycling Web site: <http://www.lamprecycle.org/>.
- Lighting Research Center at the Rensselaer Polytechnic Institute: <http://www.lrc.rpi.edu/>.
- CEE High-Performance Commercial Lighting Initiative Web site: <http://www.cee1.org/com/com-lt/com-lt-main.php3>.
- Quantum Consulting, *National Energy Efficiency Best Practices Study. Volume NR-1, Non-Residential Lighting Best Practices Report*: [http://www.eebestpractices.com/pdf/BP\\_NR1.PDF](http://www.eebestpractices.com/pdf/BP_NR1.PDF).
- ACEEE, *Commercial Lighting Retrofits: A Briefing Report for Program Implementers*: <http://aceee.org/pubs/a032full.pdf?CFID=873721&CFTOKEN=69155003>.
- Quantum Consulting, *National Energy Efficiency Best Practices Study. Volume NR-2, Non-Residential HVAC Best Practices Report*: [http://www.eebestpractices.com/pdf/BP\\_NR2.PDF](http://www.eebestpractices.com/pdf/BP_NR2.PDF).
- Northeast Energy Efficiency Partnerships Commercial Unitary HVAC Initiative Web site: [http://www.neep.org/initiatives/Comm\\_HVAC.html](http://www.neep.org/initiatives/Comm_HVAC.html).
- CEE Commercial HVAC initiative Web site: <http://www.cee1.org/com/hecac/hecac-main.php3>.

### **Promoting ENERGY STAR Qualifying Commercial Food Service Equipment**

Buildings that house restaurants and other food service operations are the most energy intensive commercial buildings to operate, consuming roughly two and a half times more energy per square foot than other commercial facilities.<sup>20</sup> Kitchens are found in a diverse array of commercial and institutional facilities, including restaurants, hotels, banquet halls, stadiums, casinos, schools, hospitals, and prisons. While the entire food service industry is growing, the restaurant industry is experiencing particularly rapid growth. Many commercial kitchens use both gas and electricity. Energy efficiency improvements in a commercial kitchen can produce energy savings of 10 to 30 percent.<sup>21</sup>

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<sup>20</sup> Consortium for Energy Efficiency, *Commercial Kitchens Initiative*. (2005). Available at: <http://www.cee1.org/com/com-kit/com-kit-init-des.pdf>.

<sup>21</sup> Consortium for Energy Efficiency, *Commercial Kitchens Fact Sheet*. (2007). Available at: <http://www.cee1.org/resrc/facts/comkit-fx.pdf>.

Due to the energy intensity of food service operations and the diverse array of customers that can be served by such a program, offering incentives for energy efficiency commercial food service (CFS) equipment can be an attractive opportunity for energy efficiency program administrators. At the same time, the commercial food service market is complex, with multiple equipment distribution channels. For program sponsors to have the largest market impact, they should engage a variety of market actors including end-users, dealers, distributors, manufacturers, product representatives, and kitchen design consultants.

To streamline administration of a new energy efficiency portfolio, program sponsors may choose to offer CFS equipment rebates as part of a broad-based commercial prescriptive incentive program. However, to ensure success program administrators should include targeted outreach to large food service end users (such as chain restaurants, school districts, hospitals, etc.) as well as to the diverse and specialized set of trade allies engaged in CFS equipment distribution.

ENERGY STAR specifications have been developed for the following CFS equipment: hot food holding cabinets, solid door refrigerators and freezers, fryers (electric and gas), and steam cookers (electric and gas). Specifications for commercial dishwashers and ice machines are currently in development, with market deployment of qualifying equipment expected in fall 2007. By promoting ENERGY STAR qualifying CFS equipment, energy efficiency program administrators can help their customers rein in operating costs while simultaneously reducing energy use and coincident peak demand.

Major program elements typically employed by energy efficiency program administrators include:

- Engaging key trade allies early in the program planning process and throughout program implementation, providing training and education on program offerings and attributes of high efficiency equipment.
- Prescriptive incentives for installing higher efficiency equipment, with larger incentives for equipment with a high incremental cost (such as fryers and hot food holding cabinets) and larger energy savings (such as steam cookers). Though financial incentives are usually directed at the end-user, they can also be directed at trade allies to motivate participation and ensure adequate stocking of qualified products.
- Incentives covering a suite of energy efficient CFS equipment. Since most space types use both gas and electric products, offering incentives and education on the full suite of ENERGY STAR qualifying products can provide a valuable customer service and make the program more attractive to equipment distribution networks and end-users.
- Free audits of commercial kitchens to educate end users about energy efficiency opportunities (including lighting and HVAC opportunities as well as CFS equipment).
- Marketing the program to a variety of end use sectors (independent and chain restaurants, hotels, hospitals, schools, etc.).
- Where applicable, providing education and incentives for ENERGY STAR qualified steam cookers in tandem with local water utilities.

Programs that promote ENERGY STAR qualifying CFS equipment report a levelized CCE of between \$0.01 and \$0.03/kWh and score around 2.2 to 3.0 on the TRC test.<sup>22</sup> While programs can be operational within a two to four month period, given the diffuse nature of the distribution and purchasing patterns associated with CFS equipment, seeing significant participation may take up to 12 months.

### *Further Considerations*

Once a prescriptive CFS program has achieved traction in the marketplace, program administrators may consider developing a “whole kitchen” pilot that promotes energy efficient design for commercial kitchen remodeling and new construction projects. In addition to providing opportunities to install the suite of ENERGY STAR qualified CFS equipment, the whole kitchen approach locks in additional savings by promoting other best practices and technologies to improve the efficiency of kitchens including ventilation, lighting, and hot water heating. The pilot program can also be designed to complement other programs promoting whole building energy performance in commercial buildings, leveraging ENERGY STAR whole

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<sup>22</sup> EPA estimates based on data from Otter Tail Power (MN), Southern California Edison, and Puget Sound Energy.

building efficiency tools and resources for hotels, hospitals, and schools (see *Improving Whole Building Performance* section below).

### [Resources for Additional Information](#)

ENERGY STAR resources:

- ENERGY STAR commercial food service Web site: [www.energystar.gov/cfs](http://www.energystar.gov/cfs).
- Putting Energy into Profits: ENERGY STAR Guide for Restaurants: [http://www.energystar.gov/ia/business/small\\_business/restaurants\\_guide.pdf](http://www.energystar.gov/ia/business/small_business/restaurants_guide.pdf).

Example programs from ENERGY STAR partners:

- Puget Sound Energy Rebates for Commercial Kitchen Equipment: <http://www.pse.com/solutions/kitchenrebates.aspx>.
- Energy Trust of Oregon Standard Incentives for Existing Buildings: <http://www.energytrust.org/buildingefficiency/forms.html>.
- NYSERDA Commercial Kitchens Program: [http://www.nysERDA.org/Commercial\\_Industrial/CommercialKitchens/default.asp](http://www.nysERDA.org/Commercial_Industrial/CommercialKitchens/default.asp).
- GasNetworks (New England) Program for Food Service Equipment: [http://www.gasnetworks.com/efficiency/comm\\_food-service.asp](http://www.gasnetworks.com/efficiency/comm_food-service.asp).

Publications and other resources:

- Food Service Technology Center: <http://www.fishnick.com/>.
- CEE Commercial Kitchens Initiative: <http://www.cee1.org/com/com-kit/com-kit-main.php3>.

### [Improving Whole Building Energy Performance](#)

A whole building performance approach moves beyond traditional energy efficiency programs focused on individual measures or end uses. Program administrators can enhance existing commercial programs and customer relationships while realizing greater savings by partnering with ENERGY STAR to develop whole building efficiency initiatives. Through these initiatives, commercial customers can reduce energy use by as much as 30 percent through operational and maintenance improvements and implementing energy efficiency upgrades.

The EPA energy performance rating system (within Portfolio Manager) is a key element of the ENERGY STAR whole building approach, helping building owners and managers understand energy performance, and motivating them to take action to increase efficiency. The energy performance rating system compares the energy use of an individual building against the national building stock of similar buildings using a 1 to 100 point rating system. The use of the performance rating allows program administrators to establish an important link to the national ENERGY STAR platform of tools, resources, and partners.

A range of program designs incorporating elements of the ENERGY STAR whole building approach have been implemented to date. Some programs are primarily informational, using ENERGY STAR tools and resources to educate building managers about facility energy use. Other programs use the EPA's energy performance rating system and whole building energy assessments to drive participation in existing equipment incentive programs. Still others have integrated ENERGY STAR tools as a required element of energy efficiency program participation, common in programs involving retro-commissioning or custom incentives where there is a natural linkage between tracking whole-building energy performance and a comprehensive assessment of energy efficiency opportunities across multiple building systems. The ENERGY STAR whole building energy performance approach can also support programs that provide incentives for energy performance improvement over time.

Major program elements typically employed by energy efficiency program administrators include:

- Segmentation of commercial buildings by market, enabling the use of more compelling value propositions that speak directly to a sector's key business drivers. ENERGY STAR has developed customized messaging, marketing materials, and financial value calculators to discuss energy performance with the following sectors: commercial real estate, corporate real estate, hospitality, retail, healthcare, K-12 schools, and government.

- Supporting use of the Portfolio Manager benchmarking tool by providing easy access to historical utility data and offering training and technical assistance. California utilities are pursuing automated processes where utility data is transferred directly into Portfolio Manager, eliminating the need for manual data entry.
- Engaging customers at the upper management level as well as the facility operations level to support energy performance improvements across multiple facilities and over time.
- Encouraging building owners and operators to benchmark facility energy use on an ongoing basis (through individual reminders, group newsletters, or additional technical assistance as needed), providing a simple way to monitor the results of energy efficiency upgrades and identify additional opportunities.
- Incorporating EPA recognition opportunities into program design. Buildings that receive a rating of 75 or higher from EPA's energy performance rating system can earn the ENERGY STAR, and program administrators can provide funding to support the required certification by a Professional Engineer. Program administrators can also leverage the ENERGY STAR Challenge campaign and ENERGY STAR Leaders recognition program to stimulate organization-wide energy savings of 10 percent or more.

In addition to increasing customer motivation to participate in existing energy efficiency programs and/or otherwise pursue improvements in energy efficiency, promoting the use of the EPA rating through early educational and informational efforts can help lay the foundation for a program administrator to develop more comprehensive program approaches as they gain experience with implementation. For example, energy efficiency program administrators are incorporating the EPA rating as their energy use intensity benchmark for retrocommissioning programs (Northeast Utilities and Southern California Edison) and whole-building benchmarking and upgrade programs (NSTAR Electric and National Grid). Programs incorporating these approaches are delivering substantial energy savings for a levelized CCE of \$0.03 to \$0.04/kWh.<sup>23</sup>

### *Resources for Additional Information*

ENERGY STAR resources:

- ENERGY STAR Buildings and Plants Web site: [www.energystar.gov/buildings](http://www.energystar.gov/buildings).
- EPA national energy performance rating system (available on-line through Portfolio Manager): [http://www.energystar.gov/index.cfm?c=evaluate\\_performance.bus\\_portfoliomanager](http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager).
- ENERGY STAR 10 percent Challenge: [http://www.energystar.gov/index.cfm?c=leaders.bus\\_challenge](http://www.energystar.gov/index.cfm?c=leaders.bus_challenge).

Example programs from ENERGY STAR partners:

- NSTAR ENERGY STAR Benchmarking Program: [http://www.nstaronline.com/business/energy\\_efficiency/electric\\_programs/benchmark.asp](http://www.nstaronline.com/business/energy_efficiency/electric_programs/benchmark.asp).
- Northwest Energy Efficiency Alliance Commercial Building Operations Program: <http://www.nwalliance.org/ourwork/projectssummary.aspx?ID=89>.
- NYSERDA Schools Energy Benchmarking Program: <http://www.nyserda.org/programs/schools/Benchmarking.pdf>.

Publications and other resources:

- National Action Plan for Energy Efficiency, *Benchmarking: Responding to End-User Interest in Increased Utility Provided Services*: [http://www.epa.gov/solar/pdf/napee\\_meeting/BenchmarkingPaper.pdf](http://www.epa.gov/solar/pdf/napee_meeting/BenchmarkingPaper.pdf).
- Building Owners and Managers Association International (BOMA) Energy Efficiency Program: [www.boma.org/beep](http://www.boma.org/beep).

### Promoting Power Management of Computer Monitors

<sup>23</sup> EPA estimates based on data from Northeast Utilities; NSTAR Electric and Southern California Edison.

Program sponsors in areas where there is a large commercial customer base can take advantage of substantial savings by helping those customers manage the way they operate their computers. Computers account for over 1 percent of the nation's commercial electricity usage. In a typical building, office equipment accounts for about 18 percent of electricity use<sup>24</sup> with computers accounting for more than half of that plug load. Both CRT monitors, which use roughly 60 to 70 watts when active, and flat panel monitors, which use half the power of CRTs when active, use only 2 watts when in a low-power sleep mode. All monitors have the ability to automatically enter this low-power sleep mode after a period of inactivity. The problem is that many computer monitors still are not power-managed and many businesses ask their employees to leave their computers on 24 hours a day, 7 days a week to accommodate nighttime software updates. Power managing a monitor left on all the time can save roughly 300 kWh per year. If an energy efficiency program administrator can help such a customer to power manage 1,000 monitors, savings of 300,000 kWh per year would be achieved. Savings can often be accomplished at low to moderate cost through network tools that can activate power management settings simultaneously on every computer monitor in a network.

Additional savings can also be realized through activating sleep functions in the computer as well as the monitor. Providing participants with additional information on purchasing options for a host of other ENERGY STAR qualifying products for the office (including computers, monitors, printers, copiers, televisions and electronics) provides an additional value-added service and helps avoid lost opportunities.

Major program elements typically employed by energy efficiency program administrators include:

- Programmatic capacity to discuss opportunities at a top level with business managers as well as the in-depth knowledge to communicate options and opportunities to IT managers.
- Targeted outreach and education including direct outreach to commercial customers with 500 computers or more and direct mail and online tools for smaller businesses and residential customers.
- In-depth knowledge of implementation options including commercial and publicly available software applications.

Programs can be implemented within a short time horizon, and because computers with the ability to power down and go to sleep are already installed in facilities, power management offers a great opportunity for reducing load during peak times on relatively short notice. Programs typically achieve a levelized CEE of \$0.01 to \$0.02 /kWh.<sup>25</sup>

### *Resources for Additional Information*

ENERGY STAR resources:

- ENERGY STAR Web site on PC power management: [www.energystar.gov/powermanagement](http://www.energystar.gov/powermanagement).
- ENERGY STAR train the trainer sessions can be arranged for energy efficiency program administrators interested in implementing a power management program.

Example programs from ENERGY STAR partners:

- New York EnergySmart Offices project: <http://www.nyserda.org/programs/offices/energystar.asp>.

## **Conclusion**

Though straightforward, cost-effective programs that can be launched quickly to achieve near-term energy savings will be essential to the success of early demand-side management efforts, pilot-scale initiatives that lay the groundwork for longer-term energy savings are an important component of a balanced energy efficiency portfolio. ENERGY STAR offers program administrators a powerful platform to support both types of programs. To support product-based efficiency improvement in the residential and commercial sectors, ENERGY STAR qualifying products serve a variety of end uses, including residential lighting, appliances, HVAC, and consumer electronics, as well as commercial food service and office

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<sup>24</sup> U.S. Department of Energy, Energy Information Administration, *Preliminary End-Use Consumption Estimates by Principal Building Activity Based on 1999 Commercial Buildings Energy Consumption Survey*.

<sup>25</sup> EPA estimates based on data from NYSEDA and PG&E.

equipment. ENERGY STAR also supports strategic approaches to improving whole building efficiency for new and existing homes as well as a variety of commercial and institutional facilities.

### *Resources for Additional Information*

ENERGY STAR resources:

- Overview of ENERGY STAR for energy efficiency program administrators
  - ENERGY STAR a Powerful Resource for Saving Energy  
[http://www.epa.gov/cleanenergy/pdf/napee\\_energystar-factsheet.pdf](http://www.epa.gov/cleanenergy/pdf/napee_energystar-factsheet.pdf)
- Program design fact sheets for the residential sector:
  - ENERGY STAR Qualified Residential Light Fixtures: A Cost-Effective Strategy for Improving Efficiency in Existing Homes
  - Home Performance with ENERGY STAR: A Cost-Effective Strategy for Improving Efficiency in Existing Homes
  - ENERGY STAR Qualified Homes: A Proven Solution for Reducing Peak Demand and Improving Energy Efficiency in New Homes
- Program design fact sheets for the commercial sector:
  - ENERGY STAR for Commercial Buildings: Improving the Energy Performance of Existing Buildings
  - ENERGY STAR Qualifying Commercial Food Service Equipment: A Cost-Effective Strategy for Improving Efficiency in the Food Service Industry

Publications and other resources:

- ACEEE, *America's Best: Profiles of America's Leading Energy Efficiency Programs*:  
<http://www.aceee.org/pubs/u032.htm>.
- Energy Trust of Oregon, *Best Practices from Energy Efficiency Organizations and Programs*:  
[http://www.energytrust.org/library/reports/Best\\_Practices/index.html?link\\_programs\\_reports\\_lin1Page=3](http://www.energytrust.org/library/reports/Best_Practices/index.html?link_programs_reports_lin1Page=3).
- PG&E, under the auspices of the California Public Utility Commission, and in association with the California Energy Commission, San Diego Gas and Electric, Southern California Edison, and Southern California Gas Company, *Best Practices Benchmarking for Energy Efficiency Programs*:  
<http://www.eebestpractices.com/>.