



# ENHANCING THE VALUE OF SINGLE-FAMILY HOUSING PROJECTS WITH ENERGY STAR QUALIFIED PRODUCTS

Incorporating ENERGY STAR qualified products into American Recovery and Reinvestment Act (ARRA)-funded housing improvement projects can help maximize energy savings and environmental benefits.

- ENERGY STAR offers clearly defined energy performance specifications for more than 60 product categories. Recognized by more than 75 percent of the population, ENERGY STAR can be used to easily communicate energy efficiency expectations among project teams and suppliers.
- A vast network of ENERGY STAR partners including manufacturers and suppliers can be leveraged to help move projects forward. Engaging these partners helps reinforce that energy efficiency is an important and integral product feature and can help build a green work force for the long term.

This project brief focuses on opportunities for incorporating ENERGY STAR products in single-family new construction and major renovation projects. Resources for developing full-scale programs or incorporating other aspects of the ENERGY STAR portfolio are available at [epa.gov/cleanenergy/energy-programs/state-and-local/recovery.html](http://epa.gov/cleanenergy/energy-programs/state-and-local/recovery.html).

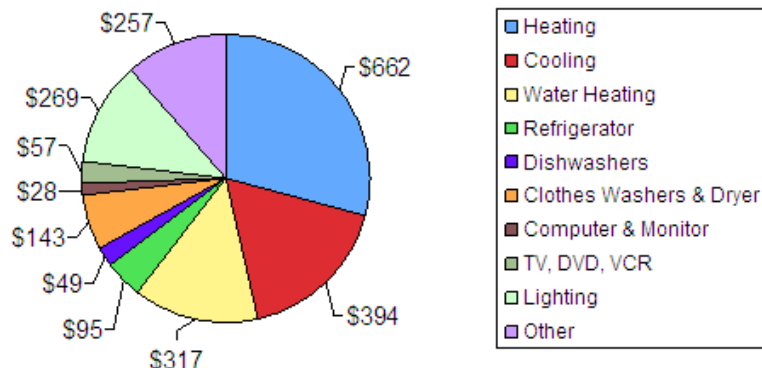
## ENERGY STAR PRODUCTS FOR SINGLE FAMILY HOUSING

Utility bills for an average U.S. household typically run about \$2,200<sup>1</sup> per year. With ENERGY STAR, these costs can be reduced by more than a third. Including ENERGY STAR products and related best practices into single-family new construction and renovation projects can provide significant benefits to homeowners, property managers, and housing authorities—improving comfort, reducing operating costs, and lowering maintenance requirements.

ENERGY STAR labeled products of greatest relevance to single-family projects include:

- *ENERGY STAR Qualified Residential Light Fixtures*
- *ENERGY STAR Qualified Appliances*
- *ENERGY STAR Qualified Windows*
- *Seal and Insulate with ENERGY STAR*
- *ENERGY STAR Qualified HVAC Equipment and Quality Installation*

**Typical House's Annual Utility Bill (\$2,200 total)**



<sup>1</sup> Source: 2009 ENERGY STAR Products Factoid Workbook. Note: Utility bills for single-family homes will be slightly higher than the **average household**, which includes apartments, attached and semi-attached home.

## TIPS FOR PROCURING ENERGY STAR PRODUCTS AND RELATED SERVICES

The following broad steps are useful to consider when procuring ENERGY STAR products and related services. More detailed information on product benefits, selection considerations, and key market actors involved in sales and installation are provided by product category in subsequent sections.

- **Procurement.** Specify ENERGY STAR in procurement language: “[Target product] must be ENERGY STAR qualified as of [insert date].” Samples of more detailed procurement language as well as key product criteria and qualifying lists by product category can be found at [energystar.gov/purchasing](http://energystar.gov/purchasing). Make sure there are no “or equal” clauses that would open the door for a contractor to install a non-ENERGY STAR product. Also, it is advisable to check for applicable building codes and state product efficiency standards in your area.
- **Bulk purchasing.** Use ENERGY STAR Quantity Quotes for bulk purchases of residential lighting, clothes washers, dehumidifiers, dishwashers, refrigerators and room air conditioners. Project managers can visit [quantityquotes.net](http://quantityquotes.net) and enter the type, quantity and other information about the product requirements; interested manufacturers will respond with a price quote and other relevant information for completing the transaction.
- **Financial incentives.** Contact your local utility or efficiency program sponsor to see if they offer financial incentives for ENERGY STAR products or related practices. Visit [energystar.gov/DIME](http://energystar.gov/DIME) for more information on utility-funded energy efficiency programs. When available, rebates are typically offered in the following ranges<sup>2</sup>:
  - Residential Light Fixtures - \$10 to \$20 per fixture, and up to \$280 for the Advanced Lighting Package<sup>3</sup>
  - Room Air Conditioners - \$25 to \$75
  - Refrigerators - \$25 to \$75
  - Clothes Washers - \$30 to \$150
  - Dishwashers - \$10 to \$60
  - Windows - \$1 to \$4/sq. ft.
  - Insulation - \$1 to \$4 /sq. ft. or percentage reduction off total project cost
  - HVAC Equipment and Quality Installation - \$100 to \$1,100 depending on equipment type
- **Recycling.** Properly recycle older appliances to ensure that inefficient products don’t end up in the landfill or get installed elsewhere. Visit [energystar.gov/recycle](http://energystar.gov/recycle) to find out about options in your area. If targeting a significant number of units across multiple projects, it may be beneficial to work with a national or regional appliance recycling company to provide turnkey services (eligibility verification, appointment scheduling, appliance pickup, recycling and disposal). The Steel Recycling Institute is another source for identifying recycling options ([recycle-steel.org](http://recycle-steel.org)).
- **Finding qualified contractors.** For home envelope and heating and cooling related improvements, it is important to find qualified contractors to perform the job.
  - If your local utility or energy efficiency program administrator sponsors a Home Performance with ENERGY STAR program, they may be the best resource. Home Performance with ENERGY STAR (HPwES) is a comprehensive, whole house approach to improving home energy efficiency and comfort. Visit [energystar.gov/homeperformance](http://energystar.gov/homeperformance) to see if a program is offered in your area.
  - Home Energy Raters (HERS) are another resource for identifying qualified contractors if a HPwES program is not available in your area. Visit [energystar.gov/homesealing](http://energystar.gov/homesealing) and click on “Home Energy Rater” to find raters in your area.

---

<sup>2</sup> Source: [energystar.gov/dime](http://energystar.gov/dime)

<sup>3</sup> Source: (Advanced Lighting Package) [energystar.gov/dime](http://energystar.gov/dime) and EEPS partner websites – Alliant, MidAmerican, and SMUD.

- For insulation projects, specify in procurement language that “Contractors are required to have prior air sealing experience, use insulation bearing the ENERGY STAR label, and install to the Seal and Insulate with ENERGY STAR guidelines posted at [energystar.gov/homesealing](http://energystar.gov/homesealing).”
- **Quality installation.** To ensure quality installation of heating and cooling equipment, make sure contractors can verifiably complete the necessary assessments and tasks listed on the ENERGY STAR *Heating & Air Conditioning Installation Bid Comparison Checklist* (available at [energystar.gov/heatcool](http://energystar.gov/heatcool)). Using this list in the vetting of bids can help define solid parameters for quality control in HVAC system upgrades.
- **Weatherization assistance.** Determine if your project qualifies for additional funding from the U.S. Department of Energy Weatherization Assistance Program, which provides funding and technical assistance for state-run low-income weatherization programs. For more information, access *Weatherization Assistance Program—the American Recovery and Reinvestment Act of 2009* by visiting [apps1.eere.energy.gov/weatherization/about.cfm](http://apps1.eere.energy.gov/weatherization/about.cfm).

## TOOLS FOR ESTIMATING ENERGY AND ENVIRONMENTAL BENEFITS

While the individual benefits of ENERGY STAR products vary by product category, savings can really add up, especially when purchasing for multiple housing units or projects. For example, installing 20 ENERGY STAR qualified clothes washers can save over \$900 annually on electric, water, and/or gas bills and over \$10,000 over the life of the units. This keeps more than 50,000 pounds of greenhouse gas emissions out of the atmosphere<sup>4</sup>.

To estimate savings from installing ENERGY STAR products, take advantage of calculators available at [energystar.gov/purchasing](http://energystar.gov/purchasing) for most product categories. The calculators allow users to customize utility rates and input the number of products and other relevant parameters to generate estimates of lifecycle energy and cost savings, simple payback, and air pollution reduction benefits.

The following chart provides national average estimates of energy and dollar savings by product category.

ENERGY STAR Qualified Product	Annual Energy and Water Savings per Product	Annual Dollar Savings per Product
Light Fixtures	45-260 kWh/year <sup>a</sup>	\$5-\$30/year
Room Air Conditioners	45 kWh/year	\$5/year
Refrigerators	105 kWh/year	\$12/year
Clothes Washers	124 kWh/year or .43 MBtu and approximately 7,000 gallons of water/year <sup>b</sup>	\$47/year
Dishwashers	30 kWh/year or .07 MBtu and 430 gallons of water/year <sup>c</sup>	\$6/year
Windows	6.1-30.9 MBtu <sup>d</sup>	\$126-\$465 for single-paned windows and \$27-\$111 for double-paned windows <sup>e</sup>
Seal & Insulate with ENERGY STAR	20 percent reduction in heating and cooling energy use/costs <sup>f</sup> ; 10 percent reduction in annual energy bills	\$200/year
HVAC Quality Installation	233-5,200 kWh/year and/or 6-10 MBtu	> \$200/year

Source: 2009 ENERGY STAR Products Factoid Workbook. (unless otherwise noted)

<sup>a</sup> Source: based on annual dollar savings shown the ENERGY STAR Factoid Workbook and \$0.1127/kwh electric rate

<sup>b</sup> Source: ENERGY STAR Factoid Worksheet

<sup>c</sup> Source: ENERGY STAR Factoid Worksheet

<sup>d</sup> Source: ENERGY STAR for Windows, Doors, and Skylights Cost and Energy Savings: National, Regional, and City Estimates, Factoids, and Their Use available at [energystar.gov/ia/partners/manuf\\_res/windows/ES\\_Windows\\_Cost\\_Energy\\_Savings.pdf](http://energystar.gov/ia/partners/manuf_res/windows/ES_Windows_Cost_Energy_Savings.pdf)

<sup>e</sup> Source: [energystar.gov/index.cfm?c=windows\\_doors.pr\\_savemoney](http://energystar.gov/index.cfm?c=windows_doors.pr_savemoney)

<sup>f</sup> Source: [energystar.gov/homesealing](http://energystar.gov/homesealing)

<sup>4</sup> Source: 2009 ENERGY STAR Products Factoid Workbook

## ENERGY STAR QUALIFIED RESIDENTIAL LIGHT FIXTURES

While ENERGY STAR CFLs may make the most sense for simple retrofit efforts, major renovation projects offer a prime opportunity to switch to light fixtures that can only accommodate efficient replacement bulbs—locking in savings for the long-term.

- ENERGY STAR fixtures use 75 percent less energy and their bulbs last up to ten times longer than standard incandescent bulbs providing both efficiency and maintenance benefits. In addition, ENERGY STAR qualified outdoor fixtures provide security and energy savings through the use of photo sensors and motion sensors.
- The fixture, lens/shade, lamps (bulbs) and ballasts are designed as an integrated unit to ensure the lamps and ballasts can deliver the designated long life and light output; as well as provide exceptional aesthetics and shielding of the bulb.
- ENERGY STAR fixtures are available from a wide variety of manufacturers in a broad array of styles. Today, 160 lighting manufacturers offer nearly 20,000 ENERGY STAR qualified fixture models (April 2009)<sup>5</sup>.

**Selection and other considerations:** Outdoor fixtures (near the front door and patio/balcony), recessed, ceiling flush mount, and bath vanity fixtures are practical, cost-effective applications in major renovation projects due to their long hours of use and widespread availability in different sizes and styles.

For additional savings, select ENERGY STAR ceiling (flush) mount fixtures instead of recessed light fixtures (“recessed cans”). Flush mount fixtures help prevent the conditioned room air from escaping up into the attic and unconditioned spaces. Recessed fixtures require a much larger hole in the ceiling and often create a chimney effect that allows conditioned air to escape the room. When using recessed fixtures, select ICAT (insulation-contact, air-tight) fixtures to minimize air loss.

Specifying that contractors install an ENERGY STAR Advanced Lighting Package where 60 percent of the fixtures and 100 percent of ceiling fans are ENERGY STAR qualified is a more flexible approach to achieving significant energy savings. Some utilities provide incentives for installing an ENERGY STAR Advanced Lighting Package.

**Working with key lighting market actors:** Engaging the following key lighting market actors as soon as possible can help ensure projects run smoothly.

- **Electrical distributors.** Electrical distributors serve as the go-between with manufacturers and builders/lighting contractors to assemble lighting packages and sometimes determine pricing. They typically sell only to contractors and can usually deliver in large quantity. Informing electrical distributors well in advance of intent to exclusively source ENERGY STAR qualified fixtures for major renovation projects can help ensure products are available when needed and help with obtaining the best price. A list of ENERGY STAR distributor partners is available at: [energystar.gov/index.cfm?c=pt\\_reps\\_lighting\\_upgrade.partners](http://energystar.gov/index.cfm?c=pt_reps_lighting_upgrade.partners). These distributor partners are knowledgeable about ENERGY STAR features and benefits and carry ENERGY STAR products from several manufacturers.
- **Manufacturers.** For larger projects or a portfolio of projects (e.g., involving 100 or more fixtures), project implementers may find it beneficial to contact the lighting manufacturer directly. This can be done by calling the manufacturer’s customer service line and requesting the local sales representative’s contact information. A list of ENERGY STAR manufacturing partners can be found at: [energystar.gov/partnersearch](http://energystar.gov/partnersearch) by clicking on the manufacturer list link. Manufacturer sales reps usually have relationships with electrical distributors and often work directly with the builders and project implementers to determine price and ensure product availability.
- **Showrooms.** Showrooms are a good resource for smaller projects. While they typically sell to the general public, they may be directly linked to a distributor or have a contractor desk. Using the zip code search function of the ENERGY STAR store locator ([energystar.gov/storelocator](http://energystar.gov/storelocator)) can be an easy way to identify an initial list of knowledgeable showrooms.

---

<sup>5</sup> Source: Manufacturer and qualified product lists for CFL and LED fixtures available at [energystar.gov/index.cfm?c=fixtures\\_pr\\_fixtures](http://energystar.gov/index.cfm?c=fixtures_pr_fixtures)

- **Contractors.** Although contractors generally install what is specified, sometimes changes are made in the field. Contractors should be notified that non-ENERGY STAR substitutes are not allowed. A random visual inspection may be needed to verify the project was installed as specified.

## ENERGY STAR QUALIFIED APPLIANCES

ENERGY STAR qualified appliances, such as room air conditioners, refrigerators, dishwashers, and clothes washers use 10–50 percent less energy and water than standard models<sup>6</sup>. With rising utility bills, switching out a standard model appliance for an ENERGY STAR qualified one offers many benefits.

- **Room air conditioners.** Roughly one quarter of U.S. homes have at least one room air conditioner<sup>7</sup>. They are most commonly found in older housing stock located in cooler climates. ENERGY STAR qualified room air conditioners use at least 10 percent less energy than conventional models. Depending on the climate, this could mean savings of \$20 to \$300 over the lifetime of the unit<sup>8</sup>.
- **Refrigerators.** Today’s ENERGY STAR qualified refrigerators use less energy than a 60 watt light bulb run continuously. Unfortunately, one quarter of the existing stock of refrigerators in U.S. homes were manufactured before minimum efficiency standards took effect in 1993.<sup>9</sup> In fact, replacing refrigerators manufactured before 2001 is generally cost-effective<sup>10</sup>. Inputting the model number of an existing unit in the ENERGY STAR online calculator can help quantify savings more precisely, visit [energystar.gov/purchasing](http://energystar.gov/purchasing) and click on “Refrigerator Savings Calculator.”
- **Clothes washers.** A single clothes washer can save nearly \$50 per year and use 7,000 fewer gallons of water<sup>11</sup>. ENERGY STAR clothes washers also have more room for bulky items, get clothes cleaner, and are gentler on clothes.
- **Dishwashers.** ENERGY STAR qualified dishwashers are on average 10 percent more energy efficient than non-qualified models. Compared to a 2008 conventional model, an ENERGY STAR dishwasher will save \$6 per year on energy costs. Replacing a dishwasher manufactured before 1994 with an ENERGY STAR qualified dishwasher can save more than \$30 a year in utility costs<sup>12</sup>.

**Selection considerations:** Major manufacturers offer ENERGY STAR qualified appliance models with a variety of styles and features. For single-family housing projects, consider the following:

- Room air conditioners are usually specified based on the types of windows installed and room size. It is particularly important to have accurate information on room size to determine proper sizing, as oversized air conditioners are both less effective and less efficient. Information on proper sizing is available at [energystar.gov/index.cfm?c=roomac.pr\\_properly\\_sized](http://energystar.gov/index.cfm?c=roomac.pr_properly_sized).
- Single-family housing projects typically specify basic refrigerator models with a top freezer. ENERGY STAR also qualifies compact refrigerators and freezers with volumes less than 7.75 cubic feet<sup>13</sup>. To achieve ideal energy savings and performance, refrigerators should be set between 35 and 38 degrees Fahrenheit and freezers set to 0 degrees Fahrenheit.

<sup>6</sup> Source: [energystar.gov/index.cfm?c=appliances.pr\\_appliances](http://energystar.gov/index.cfm?c=appliances.pr_appliances)

<sup>7</sup> Source: 29<sup>th</sup> Annual Portrait of the U.S. Appliance Industry, *Appliance Magazine*, September 2006.

<sup>8</sup> Source: ENERGY STAR 2007 Room Air Conditioners Partner Resource Guide, [energystar.gov/ia/partners/manuf\\_res/downloads/2007RoomAC\\_prg.pdf](http://energystar.gov/ia/partners/manuf_res/downloads/2007RoomAC_prg.pdf)

<sup>9</sup> Source: US Department of Energy: Energy Efficiency and Renewable Energy, “*Emerging Technologies: Appliance Research and Development.*”

<sup>10</sup> Source: “Refrigerator / Freezer Fun Facts” [energystar.gov/ia/products/recycle/documents/RefrigeratorAndFreezerFunFacts\\_FINAL.pdf](http://energystar.gov/ia/products/recycle/documents/RefrigeratorAndFreezerFunFacts_FINAL.pdf)

<sup>11</sup> Source: ENERGY STAR Factoid Worksheet

<sup>12</sup> Source: [energystar.gov/dishwashers](http://energystar.gov/dishwashers)

<sup>13</sup> Source: [energystar.gov/refrigerators](http://energystar.gov/refrigerators)

**Working with key appliance market actors:** Engaging the following key market actors as soon as possible can help ensure projects run smoothly.

- **Project Team.** Depending on the size of the project, the project team may include the owner or developer, architect, general contractor, consultants (that may include a “green consultant”), and funding organizations. Key team members to influence include:
  - **Architect:** Specifies ENERGY STAR qualified products for the project and authorizes payment to the general contractor after verifying installation.
  - **General Contractor (GC):** Issues Request for Proposals (RFPs) from distributors and/or manufacturers for products as specified in project documents.
- **Distributors.** Local distributors serve as the go-between with manufacturers and general contractors to offer appliance packages and negotiate pricing. They typically sell only to contractors and can usually deliver in large quantity. Informing distributors well in advance of intent to exclusively source ENERGY STAR qualified products for major renovation projects is important for timely product delivery. Local distributors may be invited by the general contractor to participate in pre-bid meetings to learn about project specifications.
- **Manufacturers.** For larger jobs, project implementers may find it beneficial to contact the manufacturer directly. The manufacturers and their sales representatives may also directly contact the project team members who are identified and reported in building industry updates announcing RFP’s and project construction timelines. A list of ENERGY STAR manufacturing partners can be found at [energystar.gov/partnersearch](http://energystar.gov/partnersearch).
- **Retailers.** Local retailers are a good resource for smaller projects. While they typically sell to the general public, they may be directly linked to a distributor. Using the zip code search function of the ENERGY STAR store locator ([energystar.gov/storelocator](http://energystar.gov/storelocator)) can be an easy way to identify an initial list of local retailers.
- **Recyclers.** Appliance recyclers and energy efficiency program sponsors may be able to assist with proper disposal of old units. See the previous “*Tips for Procuring ENERGY STAR Products and Related Services*” section and [energystar.gov/recycle](http://energystar.gov/recycle) for additional information.

## ENERGY STAR QUALIFIED WINDOWS

ENERGY STAR qualified windows can save between \$126 and \$465 per year when replacing older single-pane windows and between \$27 and \$111 per year over double-pane, clear glass replacement windows<sup>14</sup>. Estimated savings vary from region to region depending on utility rates and are generally greatest in climates with extreme temperatures. In addition, ENERGY STAR qualified windows create less condensation and protect valuables from sun damage better than conventional clear-glass, double-pane alternatives. Manufacturers offer a wide variety of ENERGY STAR qualified windows in different styles and sizes for most residential applications.

**Selection considerations:** ENERGY STAR criteria for residential windows are tailored to four climate zones across the United States. A product’s energy efficiency for a given climate is based on its impact on heat gain and loss in cold weather and heat gain in warm weather. Windows that are energy efficient in Florida will not necessarily be energy efficient in Michigan and vice-versa. ENERGY STAR helps simplify the process of selecting the right ENERGY STAR qualified window for the local climate through an on-line tool at [energystar.gov/windows](http://energystar.gov/windows) (click on “Purchasing Tips”).

**Working with key window market actors:** Engaging the following key window market actors can help ensure projects run smoothly.

- **Distributors/Retailers:** Distributors/retailers typically work with the manufacturer and contractor in the sales/procurement process. Informing distributors and retailers of intent to exclusively source ENERGY STAR qualified windows for major renovation projects can help ensure product is available when needed.

---

<sup>14</sup> Source: [energystar.gov/index.cfm?c=windows\\_doors.pr\\_savemoney](http://energystar.gov/index.cfm?c=windows_doors.pr_savemoney)

- **Contractors:** Finding a professionally trained contractor to install windows according to manufacturer instructions is critical. Improper installation can void the warranty and lead to water infiltration, which can cause indoor air quality issues. Home Energy Raters may be able to help identify qualified contractors. Visit [energystar.gov/partnersearch](http://energystar.gov/partnersearch) and click on “Home Energy Rater” to find a list of Home Energy Raters.
- **Manufacturers:** For large projects, it may be beneficial to directly contact the manufacturer, which can open up opportunities for bulk purchasing and more competitive pricing. Manufacturers have local sales reps who often work directly with builders. The windows are then supplied through a local distributor.

## SEAL AND INSULATE WITH ENERGY STAR

Sealing and insulating the “envelope” or “shell” of a home — its outer walls, attic, ceiling, windows, doors, and floors — is often the most cost-effective way to improve energy efficiency and comfort. EPA estimates that quality sealing and insulating can save up to 20 percent on heating and cooling costs (or 10 percent on a home’s total annual energy bill)<sup>15</sup>.

**Project considerations:** Determining leaking areas in a home is the first course of action. Sometimes these areas can be palpably felt, but in other instances more advanced testing may be necessary to achieve full benefits. For example, open stud cavities that lead directly into unconditioned spaces can be huge sources of air leaks and should be identified by a contractor with air sealing experience.

Sealing unconditioned spaces, such as attics or storage areas in single-family homes, may be most cost-effective for renovation projects<sup>16</sup>, but sealing the basement and duct work also saves significant energy and money. Approaching sealing and insulating systematically is essential for determining how to save the most energy. *The Do-It-Yourself Guide to Sealing and Insulating with ENERGY STAR*, available at [energystar.gov/index.cfm?c=diy.diy\\_index](http://energystar.gov/index.cfm?c=diy.diy_index), is a good reference document for even very experienced project implementers, and essential for those with less experience.

Information about the appropriate type and level of insulation by climate zone and other helpful diagnostic tools are also available at [energystar.gov/homesealing](http://energystar.gov/homesealing).

**Working with key market actors:** Engaging the following market actors as soon as possible can help ensure that projects run smoothly.

- **Contractors:** Qualified contractors should be involved for quality control and verification and should have advanced testing tools and products to help them find and seal hidden leaks. If the main labor force for the project has minimal training, a contractor should still be engaged for certain parts of the job (e.g., for homes with old electrical wiring, roof damage, attic ventilation issues, or if there are recessed can lights in the attic floor). A professional can also perform a combustion safety test to make sure the home’s furnace, boiler, or water heater are venting properly after sealing and insulating. Home Energy Raters may be able to help identify qualified contractors. Visit [energystar.gov/homesealing](http://energystar.gov/homesealing) (click on “Home Energy Rater”) to find HERS raters in your area.
- **Community organizations:** Community organizations are getting involved with energy efficiency and weatherization projects in low-income communities. Community organizations often emphasize the energy cost savings for residents, but many programs also consider weatherization projects for job training activities and may recruit youth or unemployed persons from the community to participate.

---

<sup>15</sup> Source: [energystar.gov/homesealing](http://energystar.gov/homesealing)

<sup>16</sup> Source: Business Case Study: Adopting a Whole-House Approach, *Energy Coordinating Agency and Smart Energy Solutions, Philadelphia, PA*

## ENERGY STAR QUALIFIED HEATING, COOLING AND VENTILATION (HVAC) EQUIPMENT AND QUALITY INSTALLATION

As much as half of the energy used in a home goes to heating and cooling. Depending on the climate zone, replacing inefficient heating and cooling equipment with ENERGY STAR qualified equipment can save more than \$200 on total annual energy bills. As a general rule of thumb, air conditioners and heat pumps that are more than 12 years old are good targets for evaluation and potential replacement with new ENERGY STAR qualified units<sup>17</sup>.

**Selection considerations:** Replacement of HVAC equipment should be done in coordination with air sealing and insulation projects in order to ensure equipment is sized correctly and that any related changes in airflow throughout the home do not cause combustion safety problems for gas-fired appliances. A complete guide to effective residential HVAC system assessment and upgrade is available at [energystar.gov/heatcool](http://energystar.gov/heatcool), (click on *Guide for Energy Efficient Heating and Cooling*).

For new equipment upgrades, emphasis should be placed on [quality installation](#). Much of the energy consumed by HVAC systems can be attributed to improper sizing and poor installation of duct work and insulation, which cause equipment to run longer or with greater intensity to maintain desired comfort levels. In fact, from an efficiency standpoint an improperly installed SEER 13 unit can perform like a SEER 10 air conditioner—a 30 percent drop in expected efficiency<sup>18</sup>!

**Working with key HVAC market actors:** Engaging the following market actors as soon as possible can help ensure that projects run smoothly.

- **Manufacturers:** Working initially with the manufacturer can open up opportunities for bulk purchasing and more competitive pricing. A list of manufacturing partners can be found at [energystar.gov/partnersearch](http://energystar.gov/partnersearch).
- **Contractors:** Qualified contractors are critical for proper sizing and installation of equipment. ENERGY STAR provides tips for choosing appropriately sized equipment<sup>19</sup> and has developed guidelines together with the Air Conditioning Contractors of America (ACCA) on HVAC quality installation ([energystar.gov/qispec](http://energystar.gov/qispec)). Additionally, ENERGY STAR offers tips for recruiting HVAC contractors at [energystar.gov/heatcool](http://energystar.gov/heatcool). It is important to note that contractors usually only carry products from certain manufacturers.

### Optimize HVAC Equipment with Proper Maintenance

If equipment upgrades are not required then the following maintenance checks are recommended:

- Inspect; clean or change air filters
- Check thermostat settings
- Tighten all electrical connections
- Lubricate all moving parts
- Check and inspect the condensate drain
- Check controls of the system
- Clean evaporator and condenser air conditioning coils
- Check central air conditioner's refrigerant level
- Clean and adjust blower components
- Check all gas (or oil) connections, gas pressure, burner combustion and heat exchanger

For more specifics on the above recommended maintenance items, visit [energystar.gov/heatcool](http://energystar.gov/heatcool) (click on "Maintain your Equipment: A Checklist.")

<sup>17</sup> Source: *Guide for Energy Efficient Heating and Cooling* [energystar.gov/ia/products/heat\\_cool/GUIDE\\_2COLOR.pdf](http://energystar.gov/ia/products/heat_cool/GUIDE_2COLOR.pdf)

<sup>18</sup> Source: [energystar.gov/heatcool](http://energystar.gov/heatcool)

<sup>19</sup> Visit [energystar.gov/index.cfm?c=heat\\_cool.pr\\_properly\\_sized](http://energystar.gov/index.cfm?c=heat_cool.pr_properly_sized)

## ENERGY STAR AND OTHER RELATED RESOURCES:

Resource	Web or Info Link	Description
Manufacturer List	<a href="http://energystar.gov/partnersearch">energystar.gov/partnersearch</a>	Provides a searchable list of ENERGY STAR manufacturing partners by product category.
Qualified Products Lists	<a href="http://energystar.gov/purchasing">energystar.gov/purchasing</a>	Provides a list of qualified products by manufacturer and product type.
Lighting Showroom Locator	<a href="http://energystar.gov/storelocator">energystar.gov/storelocator</a>	A retail store locator searchable by zip code, which includes ENERGY STAR showroom partners.
Electrical Distributor List	<a href="http://energystar.gov/index.cfm?c=pt_reps_lighting_upgrade.partners">energystar.gov/index.cfm?c=pt_reps_lighting_upgrade.partners</a>	Provides a list of distributors that supply ENERGY STAR lighting.
Home Sealing and Insulation Diagnostic Tools	<a href="http://energystar.gov/homesealing">energystar.gov/homesealing</a>	Provides links to diagnostic tools, home graphics to help guide sealing and insulating efforts, tips on types and appropriate levels of insulation by climate zone.
U.S. Department of Energy Home Weatherization Program	<a href="http://apps1.eere.energy.gov/weatherization/about.cfm">apps1.eere.energy.gov/weatherization/about.cfm</a>	Provides links to funding and technical resources for the DOE's Low Income Home Weatherization Program.
HVAC Diagnostic Tools	<a href="http://energystar.gov/heatcool">energystar.gov/heatcool</a>	Provides links to useful diagnostic web tools, such as the Home Energy Yardstick and The Guide to Energy Efficient Heating and Cooling that can help evaluate a homes energy performance.
Energy Efficiency Programs and Incentives (DIME)	<a href="http://energystar.gov/dime">energystar.gov/dime</a>	Provides a list of utility partner incentives by product category.
Federal Tax Credits	<a href="http://energystar.gov/taxcredits">energystar.gov/taxcredits</a>	Provides information on available federal tax credits for energy efficient products.
Quantity Quotes	<a href="http://quantityquotes.net">quantityquotes.net</a>	A useful tool to purchase some ENERGY STAR products in bulk.
Procurement Language	<a href="http://energystar.gov/purchasing">energystar.gov/purchasing</a>	Provides sample procurement language and other related resources for ENERGY STAR qualified products.
Product specifications	<a href="http://energystar.gov/purchasing">energystar.gov/purchasing</a> <a href="http://energystar.gov/lighting">energystar.gov/lighting</a> <a href="http://energystar.gov/homesealing">energystar.gov/homesealing</a> <a href="http://energystar.gov/heatcool">energystar.gov/heatcool</a> <a href="http://energystar.gov/windows">energystar.gov/windows</a>	Provides technical specification information for ENERGY STAR qualification. Can be used as background information, and/or reference in procurement documents.
Recycling	<a href="http://energystar.gov/recycle">energystar.gov/recycle</a>	Provides savings calculators and program planning guides for developing a successful recycling program.