



HOME ENERGY USE: MAKING SMART CHOICES

by Brian Atchinson

Energy efficient choices at home can cut families' greenhouse gas emissions and energy bills by about a third without sacrificing features, style or comfort.

The energy we use in our homes often comes from the burning of fossil fuels in power plants, a process that contributes to smog, acid rain and global warming. In fact, according to the U.S. Environmental Protection Agency (EPA), the typical home adds more greenhouse gas pollution to the atmosphere every year than the average car. However, energy efficient choices at home can cut families' greenhouse gas emissions and energy bills by about a third without sacrificing features, style or comfort.

Small Changes Help

New Yorkers have access to many state resources that help us use less energy at home and live a life more in tune with the environment. From changing a light

bulb to installing a photovoltaic (PV) electric system, the New York State Energy Research and Development Authority (NYSERDA) is the first place residents should turn to for ways to make smart energy choices for their homes and, ultimately, the environment.

“Investing in energy efficiency at home is a big step towards protecting the environment,” says Peter R. Smith, former President and CEO of NYSERDA. “Some people want to make small changes, like upgrading energy-efficient lighting and products. Other people are interested in wind power, geothermal heating and cooling, and solar electric power. NYSERDA has programs for both ends of the spectrum and virtually everything in between.”

Smart Energy Options for Existing Homes

The Home Performance with ENERGY STAR Program is one of the most practical ways to improve the environment inside and outside of an existing home. Through this program, homes of any size or style can be improved to use up to 40 percent less energy, significantly reducing their greenhouse gas emissions.

Through the Home Performance with ENERGY STAR Program, a participating Building Performance Institute (BPI) accredited contractor will test a home's energy performance and overall health and safety. During the assessment, the contractor will test the home for air leakage and will look for opportunities to improve the home's insulation, heating and cooling systems, windows, appliances and lighting. The contractor will also inspect and test combustion appliances such as heating equipment, ovens and water heaters to make sure dangerous combustion gases like carbon monoxide are not leaking into the home. When the assessment is complete, the contractor will identify what improvements can be made, the cost of making those improvements, and what kinds of financial incentives—such as low-interest financing—are available to homeowners. BPI accredited contractors use what they learned in the assessment to complete the energy-efficient improvements.

Multifamily buildings can also be improved to use less energy, increase comfort and safety, and reduce environmental impact. Thanks to NYSERDA's Multifamily Performance Program, energy efficiency services and incentives are available to owners, developers, and facility and property managers of existing and new residential buildings with five units or more. The energy efficiency and performance of existing multifamily buildings are assessed and improved much like a single-family home would be through Home Performance with ENERGY STAR.



Inadequate or improperly installed insulation can lead to wasted energy. Contractors participating in Home Performance with ENERGY STAR are trained to check insulation levels and make sure it is installed properly.

Thanks to investments made by homeowners and NYSERDA financial incentives, more than \$110 million in home improvements have been completed in recent years. This program has helped the state remove nearly 52,000 metric tons of carbon dioxide from the atmosphere every year. That's like taking an estimated 10,300 cars off the road for a year.

Smart Energy Options for New Homes

New Yorkers are becoming increasingly interested in green construction when it comes to buying and building a new home. Although sustainable products and materials are becoming more popular, energy efficiency is the best place to start when it comes to creating a green home.

NYSERDA works with a network of builders from all across New York State to construct energy-efficient new homes. These completed homes earn the title, "New York ENERGY STAR Labeled Home." A home earning this label is built to the highest energy standards, ultimately using approximately 30 percent less energy than a conventionally-built new home.

New York ENERGY STAR Labeled Homes achieve these benefits by using improved air sealing and insulation techniques, high quality windows and doors, high-efficiency heating and cooling systems, well-sealed duct systems and ENERGY STAR qualified lighting and appliances.

Most importantly, each New York ENERGY STAR Labeled Home must pass a stringent evaluation that involves a computer-based energy analysis, inspections of systems and the way they work together as a whole, and certification testing. This advanced whole-house performance testing helps ensure that the home is properly insulated, doors and windows are installed correctly, cracks and gaps in a home are sealed, and carbon monoxide gases from appliances and heating and cooling systems are vented properly.

As a result, New Yorkers benefit from not only reduced emissions from household pollution but also reduced energy use and lower monthly energy costs, lower operating and maintenance costs, increased health and safety in the home, and a quiet, more comfortable and durable living environment.

More than 9,000 New York ENERGY STAR Labeled Homes have been built in New York, resulting in eliminating more than 40,000 metric tons of carbon dioxide from the atmosphere every year, the same as taking approximately 8,000 cars off the road for a year.

Newly constructed buildings with five units or more can also earn the ENERGY STAR label. A New York ENERGY STAR Multifamily Building must meet a set of energy standards and use at least 20 percent less energy than those built to standards set by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). The energy savings and performance standards are met by using techniques similar to the single-family New York ENERGY STAR Labeled Home.

Smart Energy Options for All Homes

A simple way to cut energy use in any home is to use products that have earned the ENERGY STAR label. ENERGY STAR qualified lighting, appliances and home electronics can cut energy bills by up to 30 percent and reduce greenhouse gases generated from energy consumption. Additionally, unplugging home electronics such as TVs, VCRs, DVD and CD players, or using a power strip to turn them off when not in use, is an easy way to make a positive impact on the environment.

To reap even greater environmental benefits and energy savings, New Yorkers can combine a whole-house approach to energy efficiency with renewable technologies such as PV electric systems, wind power and geothermal heating and cooling systems. These systems are best suited to homes that are already operating efficiently.

PV systems convert energy from the sun to power homes. Today's PV systems are primarily grid-connected, meaning that the home has an electric meter. On days when power demands exceed the output of the solar system, the home can draw power from the electrical grid. On days



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when the PV system generates more power than is needed, the electricity produced is subtracted from a home's utility bill. The meter actually spins backwards and the homeowner gets credit for the energy.

Wind turbines can be used to produce electricity for a single home or building, or they can be connected to an electricity grid for more widespread electricity distribution. They can even be combined with other renewable energy technologies.

Geothermal systems take advantage of the earth's ability to store heat in the soil. Even in northern climates, the soil maintains a temperature of approximately 50 degrees four feet beneath the earth's surface. Heat pumps move this heat energy from the soil to the house in the winter and operate in reverse in the summer, pulling heat out of the house and into the soil. Ground-source heat pumps can use much less electricity than conventional electric heating and cooling systems.

NYSERDA provides incentives for the purchase of grid-connected PV systems through an eligible installer to help offset the total installation costs by 40 to 70 percent. Additionally, cash incentives and tax credits for new grid-connected wind energy systems are also available in New York and vary depending on the installation. When combined with NYSERDA's other residential energy-saving programs, cash incentives for wind power could help reduce the total installation costs by 15 to 70 percent.

As more homeowners take advantage of products and services that help them better manage household energy, it will be easier to protect New York State's most cherished natural resources from the comfort of our own homes.

To learn more ways to help protect the environment by making smart choices about energy use at home, visit www.GetEnergySmart.org or call toll-free 1-877-NY-SMART. For more information about renewable technologies, visit www.PowerNaturally.org.

Brian Atchinson is a project manager at NYSERDA and works to develop the infrastructure for building performance and residential ENERGY STAR market transformation programs.



A simple way to decrease wasted energy and the emissions it causes is to choose products that have earned the ENERGY STAR label, such as this compact fluorescent bulb.