



Home as a System - Saving on Home Energy Costs

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Solar home (photo courtesy of the West Penn Power Sustainable Energy Fund)

What is "Home as a System"?

The concept "home as a system" looks at all aspects of a home and how they contribute to the home's energy efficiency. It includes heating and cooling systems, windows, air ducts, appliances, insulation, and other aspects of the home that contribute to energy efficiency.

How can I improve my home's energy efficiency?

The first step to improving energy efficiency is to have an energy audit performed on your home. A contractor participating in Home Performance with Energy Star (<http://www.energystar.gov/>), sponsored locally by PA Home Energy (<http://www.pahomeenergy.com/>), can help you cost-effectively improve your home's energy efficiency. Energy Star is a government-

backed program that offers a comprehensive approach to home improvement to increase comfort and real energy savings. Only service providers who have entered into an agreement with PA Home Energy are allowed to display the Home Performance with Energy Star logo. These service providers have gone through in-depth classroom and hands-on field training, have been mentored, and agree to allow ongoing third-party quality assurance of their work.

A contractor will begin by evaluating your home using state-of-the-art equipment and recommend improvements that will yield the best results. Rather than focusing on a single component, such as drafty windows, the contractor will assess how improvements to all components of the home can contribute towards a more comfortable, more energy efficient home.

Homeowners should also consider how energy consumption can change over the course of a year. Every home has a fairly stable baseload consumption that includes the energy used by appliances throughout the year, such as the water heater, refrigerator, washer and dryer, computer and television. Every home also has seasonal consumption that includes heating costs in the winter and cooling costs in the summer. To reduce your annual baseload costs, installing compact fluorescent bulbs, replace an appliance, or insulate a hot water heater.

To reduce seasonal costs, add insulation, air seal your home, or improve the efficiency of your heating or cooling system.

Energy Audit

Your home performance contractor will perform an energy audit to develop a specific plan for your home. Aspects of the audit may include:

- A review of all utility bills for the last year.
- A thorough inspection of your home including heating and cooling systems, windows, appliances, lighting and cracks around doors, electrical outlets, in attics, and around chimneys.
- On-site tests:
 - Blower door test – determines the leakiness of your home
 - Duct test – determines the leakiness of the ducts
 - Heating and Cooling system test – ensures the system is operating and venting properly
- Recommendations based on the audit, which may include:
 - Sealing air leaks around doors, windows, electrical outlets, in attics, around chimneys and recessed lighting.
 - Adding properly installed insulation in walls, floors and attics.
 - Improving heating and cooling systems by replacing them with a properly sized unit that has the Energy Star label.
 - Sealing ductwork with mastic, metal tape or aerosol-based sealant and balancing the duct system to optimize air flow to all rooms. Installing ductwork in attics, crawlspaces and some basements can also help to ensure that your home will be comfort-

able.

- Upgrading lighting and appliances to Energy Star qualified products, such as refrigerators, dishwashers, electronic equipment, light fixtures and compact fluorescent bulbs.

How do I pay for the audit recommendations?

Trying to adopt all the recommendations in a home energy audit can be expensive, but many will pay for themselves within a few years because of improved energy efficiency. After evaluating your home, the contractor will assist you in selecting improvements that will best fit your needs and budget. Pennsylvania hom-

owners can take advantage of a program called Keystone Home Energy Loan Program (Keystone HELP)(<http://www.keystonehelp.com/>). In addition, a number of Pennsylvania lenders provide energy efficiency mortgages that will allow you to finance your home remodeling. Homeowners may also receive tax credits for installing certain energy-efficient measures.

Additional Resources

PA Home Energy
<http://www.pahomeenergy.com/>

Energy Star Program
<http://www.energystar.gov>

Keystone Help Energy Loan Program
<http://www.keystonehelp.com/>

Energy Information Administration
<http://www.eia.doe.gov/>

Penn State EMS Energy Institute
<http://www.energy.psu.edu/>

Penn State Cooperative Extension Renewable & Alternative Energy Information
<http://energy.extension.psu.edu/Community.htm>

Pennsylvania Public Utilities Commission
<http://puc.paonline.com>