



Home Performance with ENERGY STAR®



# YOUR HOME ASSESSMENT

## About Home Performance with ENERGY STAR®

New Yorkers are spending more money than ever to heat and cool their homes. Many homeowners are not getting the comfort they are paying for. Many homes suffer from cold spots, rooms that are too hot or too cold, ice dams, drafts, building rot, and mold and mildew problems. They may all be common signs that the house is not properly insulated or that the heating system is improperly balanced, or that moist air in the house is not being effectively controlled. Many homes are simply heating the outdoors.

Now there's something you can do about it. The Home Performance with ENERGY STAR initiative is sponsored by the New York State Energy Research and Development Authority (NYSEDA) as part of the New York Energy Smart (SM) Program. Contractors participating in this initiative have successfully completed a comprehensive skills evaluation in home performance diagnostics. Each participating contractor has earned certification through the Building Performance Institute (BPI), a nationally recognized organization for building science technology that sets the standards for assessing and improving the energy performance of homes.

## About Your Home's Assessment

Your Home Assessment is customized to identify the particular needs of your home based on our analysis. The information that your Contractor gathered has been entered into a computer software package that helps your Contractor determine the most cost-effective measures you can take to make your house more efficient and comfortable. This report outlines that analysis, prioritizes recommended home repairs and helps you determine the best improvements for your home.



BUILDING INFORMATION	
<b>Address:</b>	1234 Bruckner Drive Pittsburg PA 84104
<b>Total Floor Area:</b>	2,400 Sq.Ft.
<b>Heated Floor Area:</b>	1,200 Sq.Ft.
<b>Year built:</b>	1955

PREPARED FOR	
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<b>Email:</b>	
<b>Date:</b>	12/4/2007

PREPARED BY	
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# YOUR ASSESSMENT

## Blower Door Tests & Air Leakage

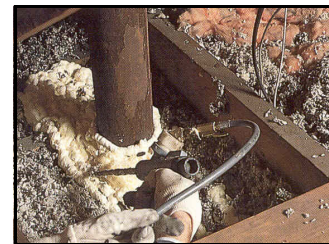
Everyone assumes that a home is built with enough insulation to help keep warm air inside during the winter, and outside in the summer. But the truth is that not all insulation performs the same, and insulation is only half the solution to making sure that your home performs at its best and to your satisfaction.

The second part of the solution to creating a better living environment is reducing uncontrolled air leakage. Typically, as much as 25% of your heating and cooling dollars escape through unseen cracks and gaps in your home, which are usually found in attics, basements, duct systems, and around floors, doors, and windows. If you combine all the holes and gaps in a typical house, it can be like leaving a window or door wide open year-round. In addition, sealing air leaks also helps prevent moisture from entering the attic and walls, which protects your home from structural or insulation damage.

Your certified Home Performance Contractor has assessed the air loss in your home using a “blower door test,” an effective and accurate method to expertly measure and identify areas where air is escaping. You probably saw it being used during the site visit. The test provides some key information about your home. “Shell Leakage” indicates the measurement of air leaking into your home. The “Building Air Tightness Limit” indicates how much air should be entering your home to help ensure that you have sufficient fresh air even when the windows are closed. If you have too much air infiltration, your Contractor will provide recommended measures to seal air leaks. If the test indicates that your house is tight, your Contractor may recommend mechanical ventilation to assist in the removal of potential indoor air pollutants.

## Stopping Air leaks

Once air leaks are detected, a variety of materials are used to eliminate air passages in attics, basements, and living spaces. The materials used in air sealing include sealant foams, rigid baffles, caulking, weather-stripping, and foam board insulation. When leaks are properly sealed, less air escapes into your attic, or passes through walls, floors, and vent stacks, or is drawn into your basement. This procedure also helps prevent moisture problems, including peeling paint and structural damage in walls and building cavities. For this reason, air sealing must accompany most attic insulation work.



## YOUR HOME'S RESULTS

### Air Leakage

Blower door test has indicated that your building shell leakage is 3200 CFM50. The current industry standard is 1064 CFM50.

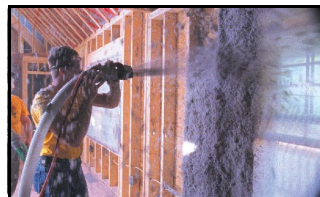
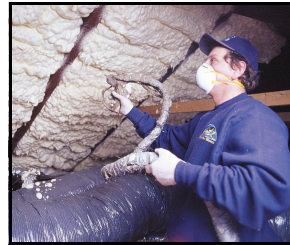
# YOUR ASSESSMENT

## Insulation

Insulation decreases your energy usage by slowing heat loss and is most effective when installed in conjunction with air sealing. Insulation also acts as a sound buffer, so you can enjoy a quieter home.

Several insulation types are available.

- Cellulose insulation is an excellent insulator made out of recycled newsprint treated with a fire retardant. It provides excellent coverage, filling in gaps often left between insulation batts and ceiling or wall joists.
- Foam insulation can be one of several products, generally spray polyurethane or spray polyisocyanurate. These are environmentally safe synthetic foams that fill gaps and holes, have excellent insulation values and block air movement.
- Fiberglass batts are the most common form of insulation. The batts must be installed very carefully to avoid leaving gaps that become leakage paths for air.



## YOUR HOME'S RESULTS

### Insulation

#### CEILING

Wood 2x6 frame, fiberglass insulation, R-19 with area of 1,200 square feet, adjacent to outdoors.

#### FLOOR ABOVE GRADE

Wood 2x10 frame, none insulation, R-3 with area of 1,200 square feet, adjacent to basement.

#### RIM JOIST

Wood 2x10 frame, none insulation, R-3 with area of 148 square feet, adjacent to outdoors.

#### SLAB BELOW GRADE

Concrete 4" frame, none insulation, R-0 with area of 1,200 square feet, adjacent to ground.

#### WALL

Block 8" frame, none insulation, R-2 with area of 1,184 square feet, adjacent to ground.

Wood 2x4 frame, uninsulated, R-4 with area of 1,332 square feet, adjacent to outdoors.

# YOUR ASSESSMENT

## Heating and Cooling Systems

About half of your home's energy costs are for heating and cooling. That's why maximizing its efficiency is important. One way to maximize performance on an existing system is through periodic maintenance, including cleaning and tuning. Oil systems should have maintenance performed annually, while gas-fired systems should be checked and serviced every two years. If your system is more than 10 years old, it may be time to replace the system with a high-efficiency and correctly sized system. New gas-fired systems should have an Annual Fuel Utilization Efficiency (AFUE) rating of at least 90%, while the minimum efficiency for oil furnaces and all types of hot water boilers is 84% AFUE. If you are considering a new system, ask for one with the ENERGY STAR label for optimum efficiency. If your Contractor recommends that your system be replaced, the assessment summary at the end of this report will include the system's estimated cost, annual savings and payback (the projected number of years it takes for the fuel savings to pay for the system).

## Hydronic Heating System

Hot water boilers distribute heat through a system of pipes and radiators or baseboard heaters. Hot water usually requires a pump to circulate the water through the home and then return it to the boiler to be reheated. Insulating these pipes can often be cost effective and is especially important when these pipes are located in cold areas such as crawl spaces, attics and drafty basements.

Pipe insulation is available in a variety of materials. Foam sleeves are the most common, however, fiberglass sleeves may be required if pipes are exposed to higher temperatures. The insulation sleeves should be cut to fit with special attention to joints, especially elbows. The insulation should be clamped or taped every two feet to secure them in place.



## YOUR HOME'S RESULTS

### Heating and Cooling Systems

#### Main Heating System

Your main heating system is a boiler with hot water distribution. It was manufactured in 1965. The efficiency of this boiler is 75 %. The fuel is natural gas. You have a total of 47 square feet of uninsulated piping in unconditioned spaces. Your distribution system efficiency is 82%.

#### Backup Heating System

None

#### Cooling System

None

# YOUR ASSESSMENT

## Windows and Doors

It's important to have well-insulated, high performance windows and doors. You'll see and feel the difference through improved comfort, reduced condensation and lower utility costs. Look for the ENERGY STAR label to identify the most efficient windows, skylights, and sliding glass doors. A window's insulating ability is measured by its U-value. Since heat flows from warm to cold in the winter, heat flows from your home interior through the windows to the colder exterior. The reverse occurs in the summer.



## Health and Safety Inspection

Your Building Performance Contractor has been trained to inspect and test combustion appliances such as heating equipment, ovens and water heaters, for proper performance to ensure safe operation. This comprehensive evaluation includes measurement of carbon monoxide produced by the appliance and an evaluation to ensure that potentially dangerous combustion gases are not introduced into the home. Certified Home Performance Contractors test for any combustion safety problems before and after performing any insulation and/or air sealing measures.



## YOUR HOME'S RESULTS

### Windows and Doors

Your house has the following windows:

Single pane clear window. Quantity: 20

Your house has the following doors:

Panel door with 7/16-in. panels with no storm door and estimated R-Value of 1.80. Quantity: 3

### HEALTH AND SAFETY INSPECTION

The following measurements were performed in your home:

1. Location: Combustion Appliance Zone CAZ  
Measurement Type: Carbon Monoxide (Worst Case)  
Measured Value: 0.0 PPM  
Problem Description:
2. Location: Combustion Appliance Zone CAZ  
Measurement Type: Depressurization (Base)  
Measured Value: -2.0 Pascal  
Problem Description:
3. Location: Combustion Appliance Zone CAZ  
Measurement Type: Depressurization (Worst Case)  
Measured Value: -5.0 Pascal  
Problem Description:
4. Location: Hot Water Heater  
Measurement Type: Carbon Monoxide (Worst Case)  
Measured Value: 7.0 PPM  
Problem Description:

# YOUR ASSESSMENT

## Health and Safety Inspection - Continued

5. Location: Primary Heating System  
Measurement Type: Carbon Monoxide (Worst Case)  
Measured Value: 21.0 PPM  
Problem Description:
6. Location: Primary Heating System  
Measurement Type: Flue Draft  
Measured Value: -4.0 Pascal  
Problem Description:

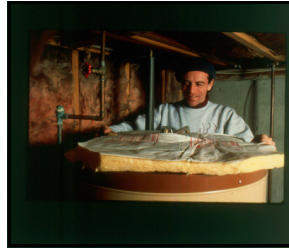
The following observations were made during a visual inspection of your home:

1. Roof and Attic1: Moisture-related damage
2. Gas Dryer Flue1: Damaged or working improperly
3. Venting Type1: Natural draft boiler/furnace commonly vented w/water heater, no vent damper
4. DHW Heater Spillage (Worst)1: Pass
5. Main Heat Spillage (Worst)1: Pass

# YOUR ASSESSMENT

## Water Heaters

Typical improvements of domestic hot water system include insulating an existing tank, replacing the existing tank with a more efficient model using the same fuel, or replacing the existing tank with another fuel source, usually natural gas or a heat pump water heater. If your hot water pipes are not insulated in a cold basement, your Home Performance Contractor will often recommend insulating the first six feet of pipe.



## Appliances

When it's time to buy or replace your home appliances, be sure to ask for models with the ENERGY STAR label. These appliances use up to 50% less energy than conventional models, saving you money on utility bills while reducing air pollution. For example, ENERGY STAR labeled clothes washers use up to 60% less energy and 36% less water. In one year, that's more water than the average person drinks in a lifetime. Many dishwashers that carry the ENERGY STAR label are built with innovative technology to clean better while using less energy and water. And, today's ENERGY STAR labeled refrigerators use half the energy of a 10-year old conventional refrigerator.



## YOUR HOME'S RESULTS

### Domestic Hot Water System

Your water heater was manufactured in 1985. Its fuel is natural gas. It has a rated volume of 40 gallons and a rated input capacity of 40,000 Btu/Hr. The heater is located in an unconditioned space and is set at 130 F. There are 10.0 square feet of hot water piping running through unconditioned spaces.

### Appliances

You have the following appliances in your home:

Clothes dryer, natural gas with estimated annual electricity usage of 96 kWh, annual natural gas usage of 92 Therm. Quantity:1

Clothes washer, hot-cold water cycle with estimated annual electricity usage of 156 kWh and annual hot water usage of 7,188 gallons.

Quantity:1

Dishwasher, 1994 or older model with estimated annual electricity usage of 470 kWh and annual hot water usage of 3,432 gallons. Quantity:1

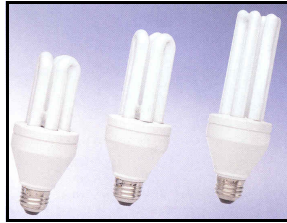
Range, electric with estimated annual electricity usage of 2,409 kWh. Quantity:1

Refrigerator - auto def top freezer, 1980 model with estimated annual electricity usage of 941 kWh. Quantity:1

# YOUR ASSESSMENT

## Lighting

When replacing light bulbs or installing new light fixtures, you'll save time and money when you choose models that have earned the ENERGY STAR. According to the EPA, today's ENERGY STAR labeled lights equal or surpass the quality of light found in conventional incandescent bulbs, using 75% less energy and lasting 10 times longer. You'll save on energy bills plus the cost and trouble of constantly replacing bulbs.



## YOUR HOME'S RESULTS

### Lighting

You have the following lighting fixtures in your home:

12 75-Watt fixtures.



# YOUR SUMMARY

This report addresses the key recommendations for improving the comfort, safety and efficiency of your home. You should use it as a guide for deciding what work you want to have done. Remember, your Home Performance Contractor is ready to complete these projects promptly, and the work is guaranteed.



Measure Description	Non-energy benefits	Package1	Package2	Package3
● Dense pack exterior walls: Upgrade 1,332 square feet of existing wall to Gyp Bd, 2x4 16" OC, 3.5" Cellulose, 1" Wood, R-12	● Improve comfort, increase value of building.	➔		\$ 1,665
● Rim Joist: Upgrade 148 square feet of existing rim joist to 2" High Density Foam, 1.5" Wood, 0.5" Wood, Siding, R-15	● Improve comfort, increase value of building.	➔		\$ 370
● Insulate Ceiling: Upgrade 1,200 square feet of existing ceiling to Gyp Bd, 2x6 16" OC, 14" Cellulose, R-46	● Improve comfort, increase value of building.	➔		\$ 2,160
● Air sealing: Reduce overall air leakage of heated area from 3200 CFM50 to 1800 CFM50.	● Reduce drafts.	➔		\$ 1,250
● High efficiency boiler: Install new natural gas 75,000 Btu/hr boiler with outdoor reset control with efficiency of 95.0 %.	● Increased equity.	➔		\$ 6,500
● Install CFL: Replace 12 existing lighting fixtures with 12 new 26-Watt 25 W Fluorescent.	● Reduce maintenance, reduce replacement cost (fluorescent bulbs last 10,000 hours whereas incandescent bulbs typically last less than 1,000 hours).	➔		\$ 0
● High efficiency water heater: Install new natural gas 40 gallon 40000 Btu/Hr hot water heater with energy factor of 0.60 and recovery efficiency of 85.0 %.	● Increase value of building.	➔		\$ 1,900
● Replace dryer flue: Improve the following condition uncovered during gas dryer flue1 : Damaged or working improperly	● Improve indoor air quality and comfort.	➔		\$ 200
● Roof repair: Improve the following condition uncovered during roof	● Improve indoor air quality and comfort.	➔		\$ 1,000

# YOUR SUMMARY

and attic1 : Moisture-related damage	
Total Installed Cost	\$ 15,045
Annual Energy Cost Savings	\$ 1,462
Annual KWh Savings, KWh	644
Total Energy Savings, MMBtu	78.7
Simple annual payback, years	10.3
Savings to Investment Ratio	NA

The following fuel prices were used to estimate annual energy cost savings, payback and savings to investment ratio:

- Electricity: 0.1560 \$/kWh
- Natural gas: 1.7800 \$/Therm



Home Performance with ENERGY STAR is sponsored by the New York State Energy Research and Development Authority (NYSERDA) and developed under the New York Energy SmartSM Program to help New Yorkers save money, energy and the environment.

Homeowner Financing Incentive
Selected Package _____
Total Amount _____
Eligible Measures at ___% _____ with Home Performance with ENERGY STAR Financing
Additional Measures at ___% _____
Monthly Payment of _____ for _____ term.
-or-
Cash Back _____

# Common House Problems That Cause High Energy Costs and Sacrifice Comfort

Many homes have these common problems which may go undetected by the homeowner. The problems are color coded in the diagram below.

## Problem: Inadequate Insulation Levels

**Effects:** Warm and cool air escapes, causing heating and cooling equipment to work harder than necessary  
Ice damming may occur, leading to roof and ceiling leaks  
Freezing pipes

## Problem: Air Leakage

**Effects:** Drafts and cool spots  
Overworking of heating and cooling equipment  
Moisture problems leading to peeling paint, mold, mildew or structural damage in walls and attic  
Inadequate air exchange causing unhealthy air quality, high humidity or dryness

## Problem: Duct Leakage

**Effects:** Uneven distribution of warm or cool air  
Uncomfortable room temperatures  
Poor heating and cooling equipment performance

## Problem: Improperly Vented Appliances

**Effects:** Dangerous carbon monoxide fumes can enter the living space when gas or oil-fired appliances are not vented properly. This is known as backdrafting and often occurs with poorly vented heating systems, stoves, water heaters and clothes dryers.

