Your Energy Audit

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Home
Sample Home

Your Address

Audit Date
May 18, 2013

Audited By
Jeremy Bryan
e3 Power
1616 17th St.
Suite #383
Denver, CO 80202
jeremy@e3power.net

Top Three Recommendations

- Replace lighting with CFL's and LED's
- Add attic insulation/ attic ventilation
- Upgrade your cooling system- See this section for more details

Safety Concerns- Fix the furnace CO problem before next winter / keep a working CO detector between the furnace/water heater and living space.

Inside Your Report

Your Concerns

We listen to you!

As our client, we want to make sure we are addressing all of your concerns for your home. If we have missed any concerns in this report, please let us know right away.

Too hot in the summer.

The homeowner would like suggestions for cooling the home during the summer. The air conditioning does not seem to provide the necessary cooling needed for the 2nd story. A combination of adding attic insulation, adding an attic fan/ventilation, and replacing your current air conditioner with a newer, more efficient model can make your home much cooler during the summer. Installing a solar powered attic fan on the south side gable vent could help create airflow through the attic by drawing cooler air from the north side gable vent and exhausting it through the south gable vent. Adding extra ventilation in the roof can create even better airflow in the attic. Closing all the shades on the west side and south side of the home will reduce the solar heat gain in the summertime.

Garage to attic connection

Garage is 30' x 26'. attic is garage is connected to the attic of the main house, through wire penetrations. Sand or shave attic hatch in garage so that it closes. This is a health and safety concern.

Solutions for your home

Estimated Totals

Approximate Cost

$ 7500

This is a ballpark estimate. Ask your contractor for a detailed bid.

Estimated Savings

$ 280/yr

This is an estimate of how much you could save starting in Year 1. Savings will only increase as energy prices rise over the years.

Impact of upgrades

Energy Reduction	17%
Carbon (CO2) Savings	5.4 tons
Equivalent cars removed from the road	1.1/yr
Equivalent number of tree seedlings grown for 10 years	139.1

Details	Approx Installed Cost	Approx Annual Savings	SIR*
Replace Lighting with CFLs or LEDs	$ 90	$150	12.9
Upgrade Water Heater	$ 1300	$70	0.8
Add Attic Insulation	$ 1600	$30	0.5
Upgrade Your Cooling System	$ 4500	$10	0

* SIR is the Savings to Investment Ratio. Simply put, if the SIR is 1 or greater, then the energy savings from the item will pay for itself before it needs to be replaced again. We use this metric to help prioritize the recommendations by financial merit.

Solution: Lighting

Benefits Estimate

Installed Cost
Approx. $ 90

Energy Savings
Approx. $ 150

Why it matters
Compact Florescent Lightbulbs (CFLs) use 1/4 of the energy of regular incandescent lightbulbs and last 8 to 15 times as long. Replacing them with CFLs will save significant energy and replacement costs over time.

LED Lights

Notes to Homeowners

Solution: Lighting

Benefits Estimate

Installed Cost
Approx. $ 90

Energy Savings
Approx. $ 150

Why it matters
Compact Florescent Lightbulbs (CFLs) use 1/4 of the energy of regular incandescent lightbulbs and last 8 to 15 times as long. Replacing them with CFLs will save significant energy and replacement costs over time.

Replacing your incandescent bulbs with CFL or LED's can reduce your lighting cost by 50% or more. When upgrading lighting to CFL's there are a couple of things to keep in mind. COLOR TEMPERATURE - This refers to the appearance of the light. Lower color temperatures (2,700 K - 3,500 K) have a warmer (orange) color to them, much like an incandescent bulb. Higher color temperatures (4,100 K - 5,000 K) have a cooler (blue) color. COLOR RENDERING INDEX (CRI) - This is the light's ability to reflect colors. Look for a higher CRI especially for clothes closets. Based on a scale of 0 – 1, A CRI of .8+ will allow easier distinction between black and navy blue. Buy one to see how it looks. Then buy the rest accordingly. Newer CFL's and LED's are made to be compatible with dimmer switches.

Notes to Contractors

Details	Now	Goal
# of Fixtures	50	
% CFLs or LED	14	90

Solution: Water Heater

Benefits Estimate

Installed Cost
Approx. $ 1300

Energy Savings
Approx. $ 70

Why it matters
Replace your water heater with a tankless model to save energy and reduce the ability for dangerous Carbon Monoxide to leak into your home.

(Left) A picture of the draft hood for the water heater. Usually there is more space between the draft hood and flue of the water heater for air to flow through. (Right) The long run of the water heater vent pipe. The flue gases have to travel a long way before they reach the chimney.

Furnace cavity return. Sealing this return can help balance available air between the water heater and furnace.

Notes to Homeowners

Solution: Water Heater

Benefits Estimate

Installed Cost
Approx. $ 1300

Energy Savings
Approx. $ 70

Why it matters
Replace your water heater with a tankless model to save energy and reduce the ability for dangerous Carbon Monoxide to leak into your home.

We are not recommending to replace your water heater at this time.The ambient CO reached 3ppm upon starting up the water heater. There is no combustion air piped in for the water heater and furnace and the water heater vent pipe has a long run to the chimney. These two issues are most certainly making it harder for the water heater to vent flue gases, which may explain the amount of CO present when the water heater was started. Sealing any air leaks in the basement is not recommended, because the water heater and furnace need the extra air. Instead, it may be helpful to seal the furnace cavity return in the basement. This leaky return sucks air out of the basement whenever the furnace kicks on and can take air away from the water heater. Sealing this return will help balance the air available to the furnace and water heater, so they can both operate more efficiently. When the time comes to replace your current water heater, buy the most efficient model you can afford. Your current water heater has an energy factor of .54. A newer water heater with a damper control can bring your EF to .64. Xcel Energy offers a $150 rebate for upgrading to a higher efficiency water heater.

Notes to Contractors

Details	Now	Goal
Energy Factor (EF)	56	82

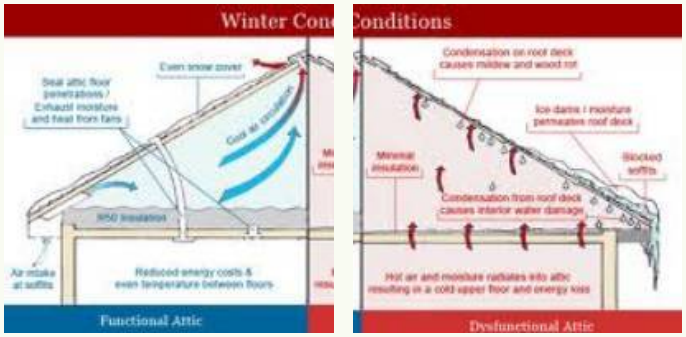
Solution: Attic

Benefits Estimate

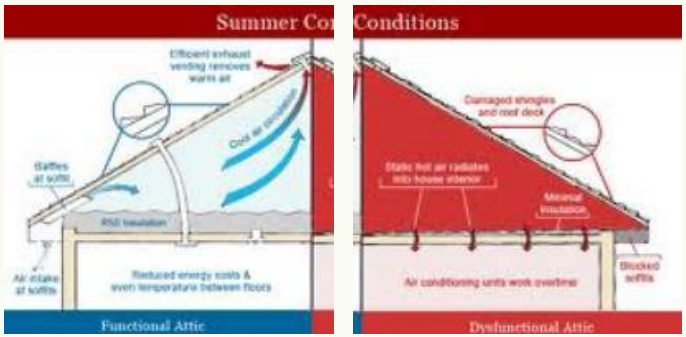
Installed Cost
Approx. $ 1600

Energy Savings
Approx. $ 30

Why it matters
Adding insulation to your attic can lead to a dramatic reduction in your utility bills. The estimated cost shown here is for a contractor adding cellulose throughout your attic space to increase the R-value to at least 38.



Winter time attic conditions: With and without insulation.



Summer time attic conditions: With and without insulation.

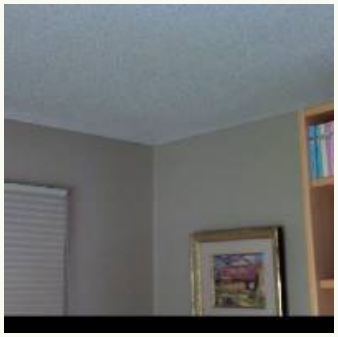
Solution: Attic

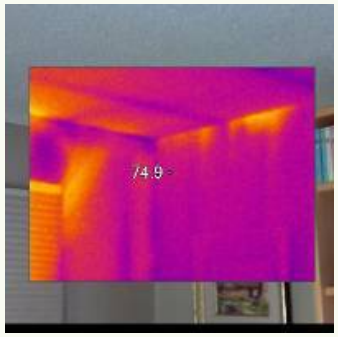
Benefits Estimate

Installed Cost
Approx. $ 1600

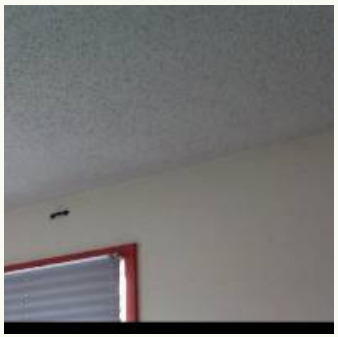
Energy Savings
Approx. $ 30

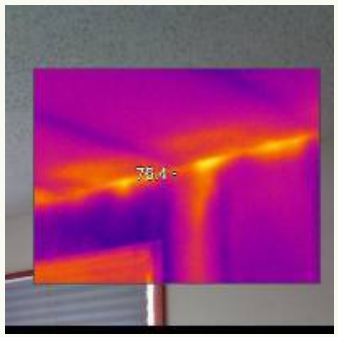
Why it matters
Adding insulation to your attic can lead to a dramatic reduction in your utility bills. The estimated cost shown here is for a contractor adding cellulose throughout your attic space to increase the R-value to at least 38.





Inconsistent insulation along the eve area in this bedroom.





Another area of inconsistent insulation.

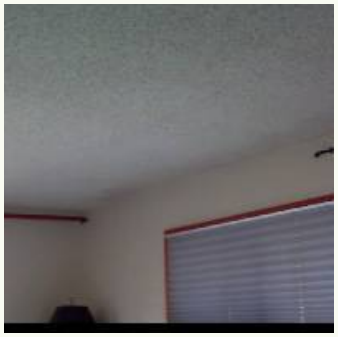
Solution: Attic

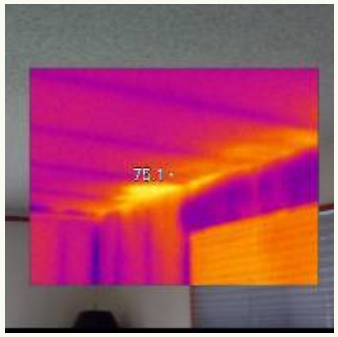
Benefits Estimate

Installed Cost
Approx. $ 1600

Energy Savings
Approx. $ 30

Why it matters
Adding insulation to your attic can lead to a dramatic reduction in your utility bills. The estimated cost shown here is for a contractor adding cellulose throughout your attic space to increase the R-value to at least 38.





More areas of inconsistent insulation.

Notes to Homeowners

Insulating the attic can substantially reduce heat loss during the winter and heat gain during the summer, making the home easier to heat and cool as well as reduce your heating and cooling costs.

Notes to Contractors

Details	Now	Goal
Attic Area (SqFt)	1014	
R Value	20	49

Solution: Cooling System

Benefits Estimate

Installed Cost
Approx. $ 4500

Energy Savings
Approx. $ 10

Why it matters
Install a more efficient air conditioner or evaporative cooler. Depending on the age of the unit, substantial savings may be gained by replacing it with an Energy Star rated appliance. If it doesn't quite make sense to replace your air conditioner now, be prepared to choose a high efficiency Energy Star unit (14 SEER or higher) when it finally wears out.

Your current air conditioner.

Notes to Homeowners

Your current air conditioner is between 31 and 35 years old. Your air conditioner should have between 2 and 3 tons of cooling capacity to effectively cool your particular home. I could not determine the size of the unit. Currently Xcel Energy has rebates available for the replacement of the unit.

Notes to Contractors

Details	Now	Goal
Output Capacity (KBtu)	2	2
Efficiency (SEER or EER)	7.4	14

Health & Safety Tests

What's This?

These tests are recommended by the Building Performance Institute (BPI). They can help identify potential health and safety concerns in your home.

Test Summary

Ambient Carbon Monoxide	✔
Undiluted Flue CO	!
Draft Pressure	✔
Worst Case Depressurization	✔
Worst Case Spillage	✔

✔ Passed
✘ Failed
! Warning

Notes for Homeowner

Worst case depressurization was -2.5. Water heater and furnace both passed worst case spillage. Undiluted flue CO for the water heater was 10 ppm. Undiluted flue CO for the furnace was 49 ppm. IT IS RECOMMENDED TO HAVE THE FURNACE CO PROBLEM FIXED. 49 ppm not a huge amount of CO for the furnace flue, but it is a little higher than it should be. Make sure to have your furnace checked before next winter. The furnace draft was -7.7. Ambient CO reached 3 ppm for less than 60 seconds when starting up the water heater. The Ambient CO was zero for the remainder of the testing. JUST TO BE SAFE, MAKE SURE THERE IS A WORKING CO DETECTOR BETWEEN THE FURNACE / WATER HEATER AND THE SPACES YOU OCCUPY.

Xcel Energy 2013 Rebate Schedule: CO Residential Energy Efficiency Programs

Check with your local jurisdiction for additional rebates, financing, and incentives you may qualify for beyond the stated Utility Rebates. Rebates and incentives are not guaranteed. Programs are subject to change. Rebates subject to change under pending PUC filings. Current information is located at xcelenergy.com/HomeRebates.

Code	Rebate Area	Qualifiers		Rebate	More Information
Cooling					
	Evaporative Coolers	Standard unit 2500 CFM	First time install	$250	Must select a qualified unit from the list on xcelenergy.com/HomeRebates
			Replacement	$100	
		Premium unit — 85% media efficiency, with purge control and thermostat	First time install	$600	
			Replacement	$500	
		Whole house system — Same equipment as Tier 2 but with ducts covering the whole house. Minimum of four supply ducts.	First time install and replacement	$1,000	
	High Efficiency Cooling (AC or ASHP)	SEER 14/EER 12 or less	New	$0	In order to receive an AC rebate, customers must use a contractor who is approved by Xcel Energy, as listed on http://hvacreducation.net/xcel-co/public_search.cfm. Contractors must have at least one NATE-certified technician, perform a load calculation for proper sizing, and use Quality Installation techniques during installation. Only new equipment located on ahridirectory.org qualify for a rebate.
			Trade-in	$500	
			Maximum rebate	$500	
		SEER 14.5/EER 12 (Tier 1)	New	$250	
			Trade-in	$500	
			Maximum rebate	$750	
		SEER 15/EER 12.5 (Tier 2)	New	$350	
			Trade-in	$500	
			Maximum rebate	$850	
		SEER 16, EER 13 (Tier 3)	New	$500	
			Trade-in	$500	
			Maximum rebate	$1,000	
	Ground Source Heat Pump	ENERGY STAR®-Qualified equals 3.3 COP, 14.1 EER	Per ton	$300	Special contractor requirements: to offer GSHP, one IGSHPA certified or NATE installation certified tech is required per contractor
			Maximum rebate	$1,500	
Heating					
	Boilers	85% AFUE	$100		
	Furnaces	92% AFUE	$80		
		94% AFUE	$120		
Water Heating					
	Standard Tank	.62 EF	$25		List of qualifying units can be found on www.energystar.gov or www.ahridirectory.org
		.65 EF	$70		
		.67 EF	$90		
	Tankless	.82 EF	$100		
	Electric Heat Pump Water Heater		$450		
Insulation and Air Sealing*					
	Insulation and air sealing, weather stripping and/or air sealing		As % of invoice, labor included	20%	Wall insulation brought to R-13. Attic insulation that's currently R-19 needs to go to R-40. Attic insulation currently at R-20+ gets additional R-25.
			Maximum rebate	$300	

Xcel Energy 2013 Rebate Schedule Continued...

Power	Rebate Area	Qualifiers		Rebate	More Information
Home Energy Audit By Xcel Energy					
	Infrared Audit		Maximum rebate	$200	Rebate is 60% of audit cost, up to maximum allowable rebate. Customers can only get rebates if using an auditor approved by Xcel Energy. Approved auditor list can be found at http://hvacreducation.net/xcel-co/public_search.cfm
	Blower door audit		Maximum rebate	$160	
	Standard audit		Maximum rebate	$100	
Home Performance With Energy Star®. Gas and electric use or electric heat only customers. Begins with a Home Energy Audit by Xcel Energy. Customers should specify that they want the higher, bundled rebates before any work is performed by a contractor.					
	Attic insulation and Bypass Sealing*	R38 or higher		$350	
	Air Sealing and Weather Stripping*	.15 NACH reduction		$160	
	High Efficiency lighting*	20 CFLs		$40	
	Wall insulation	R11 or higher		$800	
	Evaporative Cooling	Standard unit — first time use		$275	
		Standard unit - replacement		$125	
		Premium unit — first time use		$625	
		Premium unit - replacement		$525	
		Whole house system with new ducting		$1,000	
	Central AC/ASHP	14.5 SEER/EER 12		$300	
		15 SEER/EER 12.5		$400	
		16 SEER/EER 13		$550	
		Trade-in		$550	
	Ground Source Heat Pump	Energy Star Qualified equals 3.3 COP, 14.1 EER, 5 ton maximum	Per ton	$300	
			Maximum rebate	$1,500	
	Electric Heat Pump Water Heater			$550	
	Set Back thermostat	ES programmable		$25	
	High Efficiency Furnace	.92 AFUE, new		$170	
		.94 AFUE or higher, new		$200	
	High Efficiency Boiler	.85 AFUE or higher		$160	
	Electrically Efficient Furnace	ECM furnace fan motor		$200	
	Tankless Water Heater	.82 EF or higher		$200	
	Power Vented Water Heater	.65 EF or higher		$100	
	New ENERGY STAR® Refrigerator	Primary ES refrigerator		$15	
	Dishwasher (Gas or electric DHW)	.65 EF or higher		$15	
	Clothes Washer (Gas or electric DHW)	ENERGY STAR® CW		$70	

*If any of these three measures are a recommended improvement from the energy audit, they must be completed in order to successfully earn the Home Performance rebates.

KEY: Natural Gas: This symbol indicates a program designed for our natural gas customers. Electric: This symbol indicates a program designed for our electricity customers.
Participating contractor: This symbol indicates a program that requires you use an Xcel Energy participating contractor to install the equipment or make the improvement.

Tech Specs

Property Details

Year Built:	1976
Conditioned Area:	1980 SqFt
House Volume:	16580 CuFt
# of Stories:	2
# of Occupants:	1.5
Home Style:	Single-family Detached
Tuck Under Garage:	Yes
# of Cars:	2

Insulation & Air Leakage

Attic Insulation Type:	Fiberglass
Attic Insulation Amount:	7-9
Foundation Type:	
Basement	100 %
Crawlspace	-
Slab on Grade	-
Basement Wall Insulation Type:	None or Bare Walls
Crawlspace Insulation Type:	-
Exterior Wall Construction:	Frame
Exterior Wall Cladding:	Wood/Fiber Cement siding
Wall Insulation:	Yes
Air Leakage:	1925 CFM50

Heating Equipment

Primary Energy Source:	Gas
Type:	Furnace
Condensing Unit (> 90 AFUE):	No
Age:	6-15
Capacity:	100 kBtu
Duct Location:	Conditioned Space
Duct Leakage:	15% - Somewhat leaky
Duct Leakage Measurement:	-
Duct Insulation:	None

Cooling Equipment

Type:	Central AC
Ultra Efficient (16+ SEER):	No
Age:	31-35
Capacity:	2 kBtu
Ducts Shared with Heating System?	Yes

Water Heating

Energy Source:	Gas
Type:	Standard
Age:	11-15
Location:	Indoors
Temperature:	120-130

Thermostat Setpoints

Programmable Thermostat Installed?:	Yes
Heating (at home):	66 °F
Heating (sleeping):	59 °F
Cooling (at home):	78 °F
Cooling (sleeping):	85 °F

Windows & Doors

Glazing Type:	Double
Frame Type:	Wood
North Window Area:	5 %
East Window Area:	25 %
South Window Area:	20 %
West Window Area:	20 %
North Overhang:	1 Ft
East Overhang:	2 Ft
South Overhang:	1 Ft
West Overhang:	4 Ft
Skylight Area:	0 SqFt
Entry Door Type:	Wood with Storm

Tech Specs

Appliances & Lighting

Refrigerator 1 Age:	6-10
Refrigerator 1 Size:	19-21
# of Standalone Freezers:	-
Cooking Range Fuel:	Electric
Dryer Fuel:	Electric
Lighting % CFLs or LEDs:	1-25
Approx. # of Light Fixtures:	50

Utility Details

Electric Utility Name:	Xcel
Electric Utility Account Number:	53-3570358-1
Fuel Utility Name:	Xcel
Fuel Utility Account Number:	53-3570358-1
Fuel Usage Units:	Therms
Electric Usage Units:	kWh

Utility Bills

	Fuel Meter Read Date	Fuel Usage	Electric Meter Read Date	Electric Usage
End Bill 1:	06/13/2012	15	06/13/2012	349
End Bill 2:	07/13/2012	7	07/13/2012	351
End Bill 3:	08/13/2102	6	08/13/2102	206
End Bill 4:	09/13/2012	7	09/13/2012	395
End Bill 5:	10/11/2012	21	10/11/2012	304
End Bill 6:	11/09/2012	32	11/09/2012	318
End Bill 7:	12/12/2012	76	12/12/2012	501
End Bill 8:	01/16/2013	170	01/16/2013	651
End Bill 9:	02/13/2013	97	02/13/2013	399
End Bill 10:	03/14/2013	104	03/14/2013	401
End Bill 11:	04/15/2013	79	04/15/2013	470
End Bill 12:	05/14/2013	68	05/14/2013	526

Auditor's Contact Information

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About This Report

Report Date: May 18, 2013
Job ID: 12345678
Software: Snugg Pro
For software inquiries, visit
www.SnuggHome.com

Glossary

Annual Fuel Utilization Efficiency (AFUE) — The measure of seasonal or annual efficiency of a residential heating furnace or boiler. It takes into account the cyclic on/off operation and associated energy losses of the heating unit as it responds to changes in the load, which in turn is affected by changes in weather and occupant controls.

Annualized Return — The return an investment provides over a period of time, expressed as a time-weighted annual percentage. This is the equivalent annual interest rate you would get if you put the same amount of money spent on the energy upgrade into a savings account.

Asbestos — Asbestos is a mineral fiber that has been used commonly in a variety of building construction materials for insulation and as a fire-retardant, but is no longer used in homes. When asbestos-containing materials are damaged or disturbed by repair, remodeling or demolition activities, microscopic fibers become airborne and can be inhaled into the lungs, where they can cause significant health problems.

British Thermal Unit (Btu) — The amount of heat required to raise the temperature of one pound of water one degree Fahrenheit; equal to 252 calories.

Carbon Monoxide (CO) — A colorless, odorless but poisonous combustible gas with the formula CO. Carbon monoxide is produced in the incomplete combustion of carbon and carbon compounds such as fossil fuels (i.e. coal, petroleum) and their products (e.g. liquefied petroleum gas, gasoline), and biomass.

Cashflow — When financing energy efficiency improvements, cashflow is the difference between the average monthly energy savings and the monthly loan payment.

Combustion Appliance Zone (CAZ) — A contiguous air volume within a building that contains a combustion appliance such as furnaces, boilers, and water heaters; the zone may include, but is not limited to, a mechanical closet, mechanical room, or the main body of a house, as applicable.

Compact Fluorescent Light bulb (CFL) — A smaller version of standard fluorescent lamps which can directly replace standard incandescent lights. These highly efficient lights consist of a gas filled tube, and a magnetic or electronic ballast.

Cubic Feet per Minute (CFM) — A measurement of airflow that indicates how many cubic feet of air pass by a stationary point in one minute.

Carbon Dioxide (CO2) — A colorless, odorless noncombustible gas that is present in the atmosphere. It is formed by the combustion of carbon and carbon compounds (such as fossil fuels and biomass). It acts as a greenhouse gas which plays a major role in global warming and climate change.

Energy Efficiency Ratio (EER) — The measure of the energy efficiency of room air conditioners: cooling capacity in Btu/hr divided by the watts consumed at a specific outdoor temperature.

Energy Factor (EF) — The measure of efficiency for a variety of appliances. For water heaters, the energy factor is based on three factors: 1) the recovery efficiency, or how efficiently the heat from the energy source is transferred to the water; 2) stand-by losses, or the percentage of heat lost per hour from the stored water compared to the content of the water: and 3) cycling losses. For dishwashers, the energy factor is the number of cycles per kWh of input power. For clothes washers, the energy factor is the cubic foot capacity per kWh of input power per cycle. For clothes dryers, the energy factor is the number of pounds of clothes dried per kWh of power consumed.

Heating Seasonal Performance Factor (HSPF) — The measure of seasonal efficiency of a heat pump operating in the heating mode. It takes into account the variations in temperature that can occur within a season and is the average number of Btu of heat delivered for every watt-hour of electricity used.

Heat Recovery Ventilator (HRV) / Energy Recovery Ventilator (ERV) — A device that captures the heat or energy from the exhaust air from a building and transfers it to the supply/fresh air entering the building to preheat the air and increase overall heating efficiency while providing consistent fresh air.

Light Emitting Diode (LED) Lighting — An extremely efficient semiconductor light source. LEDs present many advantages over incandescent light sources including lower energy consumption, longer lifetime, improved physical robustness, and smaller size.

N-Factor — A factor of how susceptible your house is to wind, influenced by weather patterns, location, and the number of floors in the home. Used in the calculation of NACH.

Natural Air Changes per Hour (NACH) — The number of times in one hour the entire volume of air inside the building leaks to the outside naturally.

Payback Period — The amount of time required before the savings resulting from your system equal the system cost.

R-Value — A measure of the capacity of a material to resist heat transfer. The R-Value is the reciprocal of the conductivity of a material (U-Value). The larger the R-Value of a material, the greater its insulating properties.

Radon — A naturally occurring radioactive gas found in the U.S. in nearly all types of soil, rock, and water. It can migrate into most buildings. Studies have linked high concentrations of radon to lung cancer.

Rim Joist — In the framing of a deck or building, a rim joist is the final joist that caps the end of the row of joists that support a floor or ceiling. A rim joist makes up the end of the box that comprises the floor system.

Seasonal Energy Efficiency Ratio (SEER) — A measure of seasonal or annual efficiency of a central air conditioner or air conditioning heat pump. It takes into account the variations in temperature that can occur within a season and is the average number of Btu of cooling delivered for every watt-hour of electricity used by the heat pump over a cooling season.

Savings to Investment Ratio (SIR) — A ratio used to determine whether a project that aims to save money in the future is worth doing. The ratio compares the investment that is put in now with the amount of savings from the project.