ClimateSmart

City of Boulder

## 2007 Home Energy Makeover Contest Winner

## 1102 Portland Place, Boulder, CO

**Home built in 1902**
**1550 square feet**
**3 bedrooms/ 2 baths**
**3 adult occupants**

CESC
Colorado Energy Science Center

Xcel Energy

## 2007 Home Energy Makeover Contest Winner – 1102 Portland Place

**North-Central Boulder Neighborhood – House built in 1902 ~ 3 adult occupants**
**1150 square feet ~ 3 bedrooms/ 2 baths**

The majority of the energy and water efficiency measures were installed in December 2007, and work was completed by February 2008. February 2009 utility data will begin to reflect the actual energy and water savings realized by the improvements; this document details preliminary results. In the short time since the measures have been installed the savings have been huge! The home's natural gas usage dropped 67% in the first two months of 2008---a dramatic result considering not all the new products were yet installed. The home's residents paid only half the amount on their January 2008 bill as they did one year earlier.

### The Savings

This table shows the electricity and natural gas savings from the **first two months** of 2008

| | **Jan 07- Feb 07** | **Jan 08 – Feb 08** | **% Change** | **GHG emissions reduced Jan-Feb 08** |
|---|---|---|---|---|
| **Electricity Usage (KWh)** | 617 | 580 | -6.0% | 75 lbs CO2 |
| **Gas Usage (thermos)** | 439 | 146 | -66.7% | 3,426 lbs CO2 |
| **Xcel Bill Amount** | $515.71 | $128.24 | -75.1% | n/a |

### 1102 Portland Place ~ Highlights

- The As-Is original testing resulted in a HERS (Home Energy Rating System) index of 383 (Lower HERS scores reflect more energy-efficient homes)
- After improvements, the home's HERS index is 72 (311% better than it was originally and 28% better than a new code built home)
- The As-Is original seasonal average Natural Air-Change/hour (NACH) was 3.25. This was the leakiest house Lightly Treading, Inc. has ever tested
- After improvements the air leakage is 0.90 NACH...a 72% improvement in tightness
- The CO2 emissions were originally calculated to be 61,506 pounds/year (the equivalent in carbon emissions of 5.5 average automobiles)
- After improvements the home's annual CO2 emissions are estimated to be to be 14,738 pounds (the equivalent of just over one automobile's emissions)
- Utility bills were in the $3000-$3300 range per year prior to the improvements
- After improvements the utility bills are expected to fall to ~$865/year (an annual savings of $2100-$2400)

The following table summarizes the product sponsors and the measures installed in the home with respective costs and savings. It is worth noting that two of the measures (windows and window coverings), while providing significant comfort benefits and energy savings, are not as cost-effective as other measures. These measures are listed separately.

| Measure Implemented | Sponsor | Prior to Makeover | Measure Improvement | Cost of Measure | Estimated Annual Energy Savings **** |
|---|---|---|---|---|---|
| **Air-Leakage/ Repairs/Carpentry/General Contractor** | Big Horn Builders/BestWay | 3.25 NACH | 0.9 NACH | $3,000 | $901* |
| **Furnace** | Climate Masters | 60% AFUE converted oil furnace | 95% AFUE | $5,490 | $376 |
| **Water Heater** | Climate Masters | 2 older 40 gal gas tank types at 58% efficiency | Rinnai tankless with sealed combustion | $3,950 | $71 |
| **Insulation** | | | | $5,297 | |
| **Attic** | Bestway | R-7 | R-46.6 | - | $344 |
| **Wall** | Bestway | 0 | R-12 | - | $403 |
| **Crawlspace** | Bestway | No vapor barrier | Vapor barrier installed | - | $2 |
| **Foundation Walls** | Lightly Treading, City of Boulder, & Bestway | Unsealed, uninsulated rock walls | Sealed with layer of closed cell foam, insulated with R-19 Fiberglass | - | $31* |
| **Duct Work** | Climate Masters | Unsealed and leaky | All exposed ducts sealed | $1,650 | $85 |
| **Lighting** | City of Boulder | Incandescent | CFLs | $100 | $51 |
| **Washer and Dryer** | City of Boulder | None | Front Loader | $870 | $60 |
| **HERS rating** | Lightly Treading | 383 | 72 | | NA |
| **Dual-flow Toilets** | City of Boulder | 2 toilets: 6 gallon per flush & 3.5 gpf | 2 Dual-flush 0.9/1.6 gal | $1156 | 2,400 gallons |
| **Water Conservation (showerheads, faucet aerators)** | City of Boulder | standard | (2) 1.6 gpm showerheads & (2) faucet flow restrictors | $20 | 18,000 gallons |
| **Total Costs & Savings** | | | | **$21,533** | **$2,234 + 20,400 gal of water** |

**Windows and window coverings only:**

| Measure Implemented | Sponsor | Prior to Makeover | Measure Improvement | Cost of Measure | Estimated Energy Savings ****(Annual) |
|---|---|---|---|---|---|
| **Windows** | Accent | Single glazed double hung u-.90 | Heat Mirror u-.2 | $18,900 | $167** |
| **Window Coverings** | The Blind Spot | None | Hunter Douglas cellular shades | $15,278 | $82*** |
| **Total Costs & Savings** | | | | **$34,178** | **$249** |

* We estimate that ~70% of the air leakage was coming from the crawlspace walls. Thus, the $31/year in savings coming from insulating the crawlspace walls is only a fraction of the total savings from improving the crawlspace; the big savings (~$570) comes from the choice of using foam insulation to air-seal while insulating those walls.

** The windows added insulation value results in an estimated $195/year but the reduced solar heat gain results in an increase in energy costs by $28/year. Thus, the total savings is $167/year.

*** If they are closed each night during the winter this will save ~$80/year

**** All savings are calculated using today's energy prices.

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