

From Townhouse to Green House

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From Townhouse to Green House

What was done to take an ordinary townhouse and make it into a more energy efficient and sustainable residence.

- Appliances
- Lighting
- Flooring
- Other Materials & Products
- Renewable Energy
- Eco Friendly Products
- What worked and did not work
- Water Conservation Measures
- Practices for Energy Conservation
- Practices for Sustainable Living

Appliances

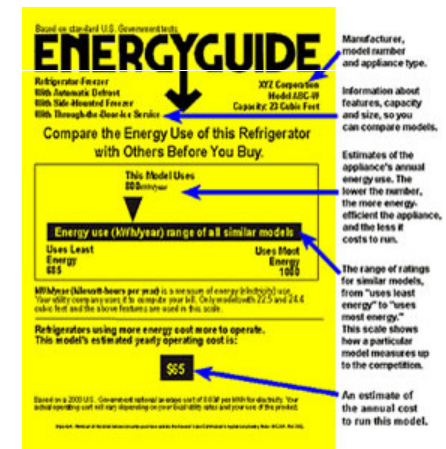


Appliances

When selecting new and replacement appliances the first thing I looked for was the Energy Star Label.



- Ranges ,Ovens, Microwaves and Clothes Dryers do not receive Energy Star Ratings
- Look at the Energy Guide Label – not all appliances are created equal
- Televisions & Audio Video Equipment
- Ceiling Fans & Lights
- Refrigerators & Freezers
- Computers & Monitors
- Heaters & Air Conditioners
- Hot Water Heaters



<http://www.energystar.gov/>



Appliances

GeoSpring Hybrid Electric Heat Pump Water Heater

- Uses an advance heat pump and traditional electric elements.
- Porcelain lined tank for insulation
- 10 Year Parts Warranty
- Programmable Controls with a Vacation Mode
- Incorporates Saver's Switch Technology
- Xcel Energy \$450 rebate (Available for 2012)
- Xcel allowed self installation
- Federal Tax Credit \$300 (Expired)
- ENERGY STAR® qualified
- Powered by 100% Renewable Energy



Installation View



LED Lighting



LED Lighting Cost Savings

	Incandescent	vs.	LED
• Bulb Life	1500 hours		30,000 hours
• Bulb Cost	\$3.50		\$30.00
• Bulbs Wattage	65 watt		20 watt dimmable
• Number of Bulbs	5		5
• Bulb Cost	\$17.50		\$150.00
• Lumens of Brightness	640		830
	Annual Operating Cost		
• Bulbs + Replacement	\$3.41		\$1.46
• Electricity @ \$.10 /kWh	\$9.19		\$2.92
• Total Cost Each Bulb	\$12.90		\$4.38
• Total for 5 Bulbs	\$64.50		\$21.90

Based on 4 hours usage per day. GE 65 Watt Flood vs. Lights of America 20 Watt Flood



LED Lighting Cost Savings

Estimated Savings for LED Bulbs

• Annual Savings	\$ 8.52/per Bulb	\$42.60/ 5 Bulbs
• Simple Paybacks/Years	3.11 years	
• Return on Investment	32.15%	
• Energy Cost Saving Over Life	\$225.00	\$1,125.00
• Total Savings Over Life	\$291.78	\$1,458.90
• Annual Energy Savings kWh	328.50	1642.50
• Annual Carbon Footprint Savings/LBS *	426.06	2130.32

* = Per DOE US Avg.

The bottom line is... Going Green is good for your wallet too!



LED Lighting



LED Lighting



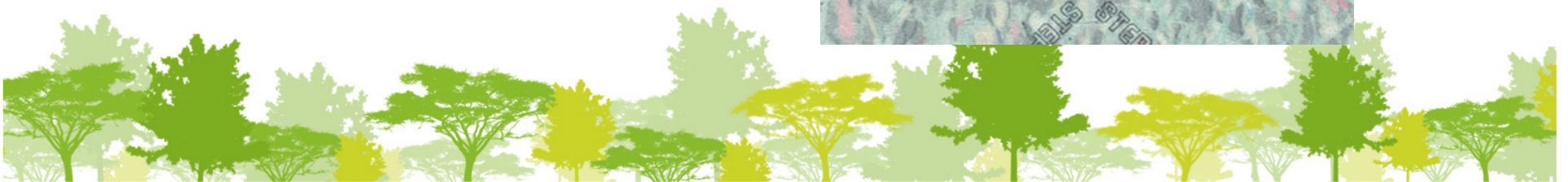


Home Remodeling



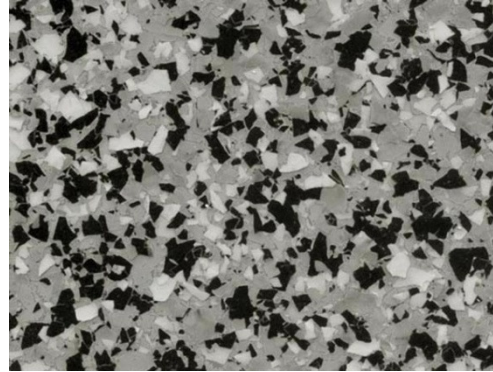
Flooring

- Used Fast Growth Woods
- Bamboo
- Sustainably Harvested Brazilian Walnut
- No- Formaldehyde Carpet
- Nike Carpet Padding
- Recycled Aggregate Tile



Remodeling Materials & Upgrades

- No VOC Paints
- Biodegradable Flooring Chips
- Whole House Fan
- Solar Attic Exhaust Fan



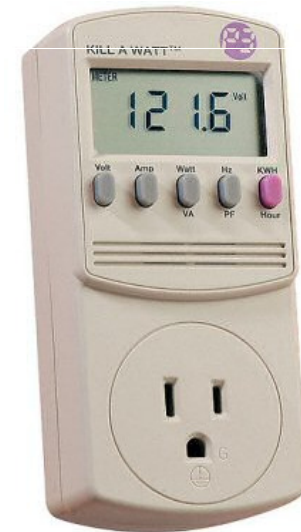
Remodeling Materials & Upgrades

Bio Fuels Fireplace



Energy Monitoring & Management

- Black & Decker EM100B Energy Saver Series Power Monitor
- Kill A Watt Electricity Usage Monitor
- Filtrete Wi-Fi-Enabled Programmable Thermostat



Renewable Energy



Xcel Energy Windsource®

Benefits of Wind Energy

- No carbon dioxide emissions
- No sulfur dioxide, nitrogen oxide, or mercury emissions
- No water consumption requirement
- Creates jobs
- Creates income for farmers
- Wind is forever (renewable)
- Wind energy reduces need for importing energy and exporting dollars
- To qualify, you must be an electricity customer of Xcel Energy in Colorado
- Requires a one-year commitment for residential customers



5kW Photovoltaic Array

Key Considerations for Photovoltaic System

- Utility Rebates - Xcel Solar*Rewards Currently \$1.00 per kW
- Renewable Energy Credits (REC) Currently \$0.09 per kWh
- Federal Tax Credit Currently 30% of System cost after Utility Incentives
- Out of Pocket Cost
- Payback/Return on Investment
- Local Companies
- Monitoring System

System Cost

- Grand Total (@ \$3.91 / Watt) \$19,539
- Xcel Solar*Rewards (@ \$1 / Watt) (\$5,000)
- Out of Pocket Cost (@ \$2.91 / Watt) \$14,539
- 30% Federal Tax Credit * (\$4,362)
- Final Cost (@ \$2.04 / Watt) \$10,177
- Time to Break Even 7 years 11 months
- Total Profit from Solar Investment / 30 years \$42,770



Solar Suppliers



LUMOS













Ig280 Lightgauge Monitor

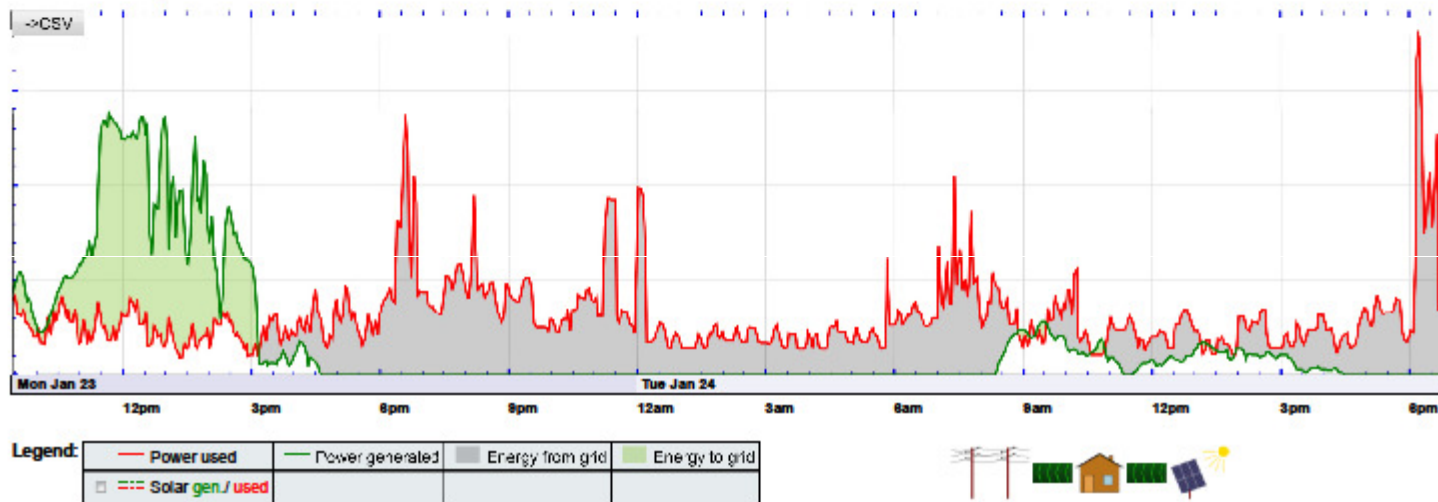
[Direct Access](#) | [Monthly Summary](#) | [Tools](#) | [Help](#) | [My Lightgauge](#)

Real-Time Data Monitoring

Emissions Savings since 09-29-09		Total Power Summary since 09-29-09		Current Performance		Cumulative Results Since now	
CO ₂ saved	14013.74 lbs	Produced	9.46 MWh	Producing	610 W	Produced	62.0 Wh
Miles not driven	19948 miles	Consumed	11.4 MWh	Consuming	219 W	Consumed	40.0 Wh
Trees planted	4.78 trees	Net	1.95 MWh bought			Net	22.0 Wh sold

Time range: Mon Jan 23, 9:26 AM - Wed Jan 25, 9:26 AM (Energy: 11.5 kWh generated, 30.6 kWh used, 19.1 kWh net)

Time zoom: Max 1y 6m 3m 1m 3w 2w 1w 4d 2d 1d 12h 6h 3h 1h Power zoom: Auto 200kW 100kW 50kW 10kW 5kW 1kW 500W 100W 50W



Be part of the solution™

Powered by Gauge



Eco Friendly Products

Water Conservation



Eco Friendly Products

- Paper Products – Earth First Paper Towels & Bath Tissue
- Non – Toxic Cleaning Products - Method brand cleaners & Simple Green
- Biodegradable Products - Clorox Green Works
- Dishwashing Soap - Kirkland Environmentally Friendly Dish Soap
- Hand Soap – Method Hand Wash- Non Toxic Ingredients
- Bath & Shower Gel - Alpine Xtreme Biodegradable formula
- Laundry Soap – Kirkland, ECOS® & Boulder Cleaners
- Dishwashing Detergent – Palmolive Eco, Meyers, Method & 7th Generation



Eco Friendly Products

What Worked – What Did Not Work

- ✓ Paper Products – Earth First Paper Towels & Bath Tissue
- ✓ Non – Toxic Cleaning Products - Method brand cleaners & Simple Green
- ✓ Biodegradable Products - Clorox Green Works
- ✓ Dishwashing Soap – Kirkland Environmentally Friendly Dish Soap
- ✓ Hand Soap – Method Hand Wash- Performed best in automatic soap dispenser
- ✓ Bath & Shower Gel - Alpine Xtreme Biodegradable formula
- ✓ Laundry Soap – Kirkland, ECOS® & Boulder Cleaners
- ✗ **Dishwashing Detergent – Palmolive Eco, Meyers, Method & 7th Generation**
- ✓ Eco Dishwashing Detergent in Pre Wash & ½ of the amount of traditional dishwashing detergent.



Water Conservation Measures

- BlueSource HYR270 HydroRight Drop-in Dual Flush Converter



- Niagara Conservation 1.5 GPM shower head



Practices for Energy Conservation & Sustainable Living



Practices for Energy Conservation

- Measure & Monitor Energy Usage
- Turn off the lights!
- Replace incandescent bulbs with LED's
- Turn off your Computer
- Use a Smart UPS
- Unplug small appliances with LCD screens
- Unplug the wall warts
- Shorter cycles for Dishwasher
- Shorter cycles for Washer



Practices for Sustainable Living

- Recycle, Recycle, Recycle
- Recycle Old Electronics (computers, monitors, TV's, wall warts)
- Reuse Items
- Use Eco Products
- Buy Local
- Paper or Plastic?
- Composting
- Urban Gardening
- Alternative Transportation
- Telecommute
- Buy organic foods
- Purchase products from companies with that support sustainable practices



Questions



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