

Improving Energy Efficiency in the Home – Making Practical Steps

March 20, 2011

GLC Education Hour

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ELCA Social Statement

“Caring for Creation”

We challenge ourselves, particularly the economically secure, to tithe environmentally.

Tithers would reduce their burden on the earth's bounty by producing 10% less in waste, consuming 10% less in nonrenewable resources, and contributing the savings to earth care efforts.

Environmental tithing also entails giving time to learn about environmental problems and to work with others toward solutions.

For the Beauty of the Earth

For the beauty of the earth,
For the glory of the skies,
For the love which from our birth
Over and around us lies.
Lord of all, to you we raise
This our hymn of grateful praise.

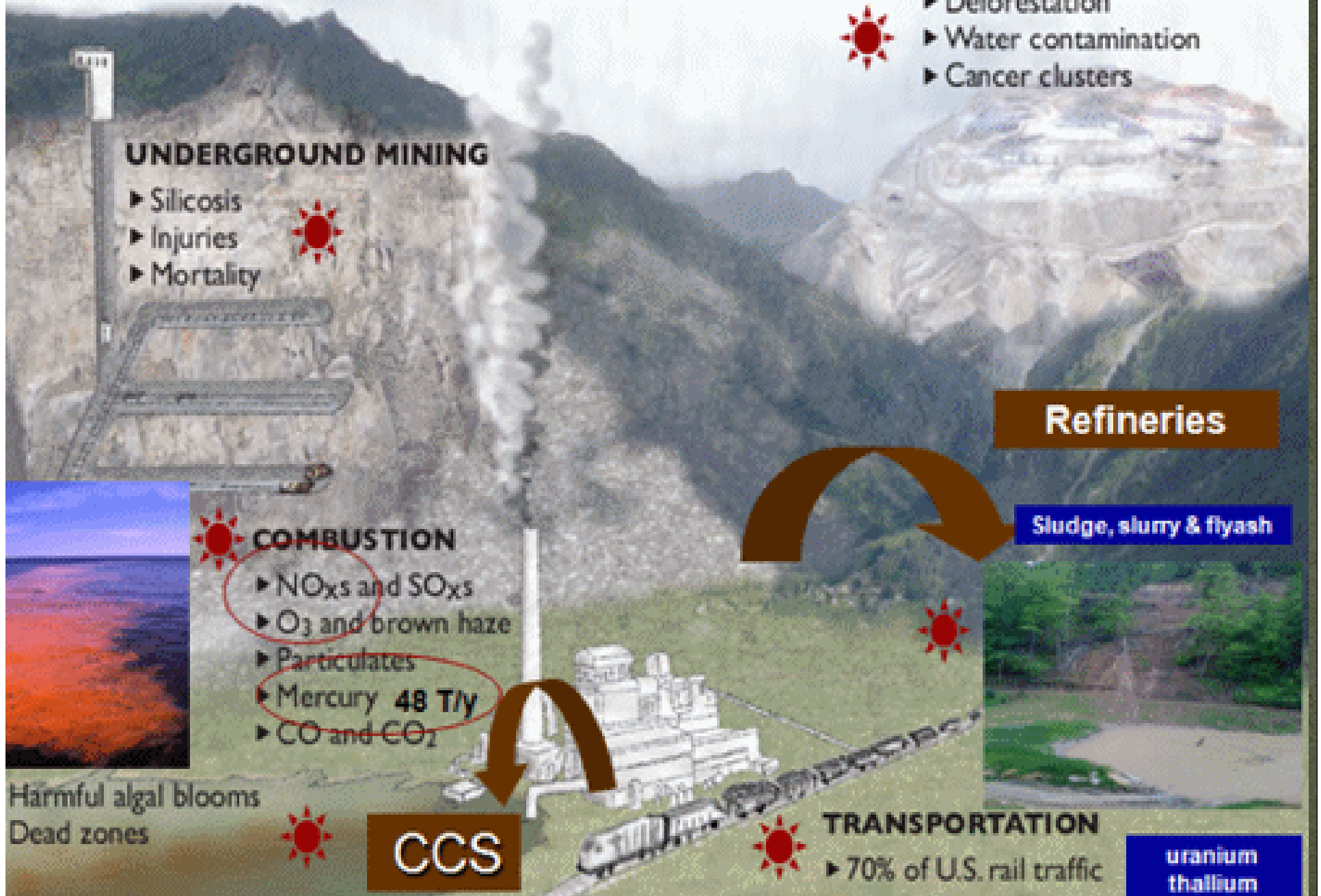
For the beauty of each hour
Of the day and of the night,
Hill and vale, and tree and flow'r,
Sun and moon, and stars of light:
Lord of all, to you we raise
This our hymn of grateful praise.

Hidden Costs of Coal

The electricity derived from coal is an integral part of our daily lives. However, coal carries a heavy burden. The yearly and cumulative costs stemming from the aerosolized, solid, and water pollutants associated with the **mining, processing, transport, and combustion** of coal affect individuals, families, communities, ecological integrity, and the global climate. The economic implications go far beyond the prices we pay for electricity.

Epstein, 2011 *Annals of the New York Academy of Sciences*

Coal life cycle



Hidden Costs of Coal

- Economic, health, and environmental costs are associated with each stage in the life cycle of coal – extraction, transportation, processing, and combustion. These costs are directly passed on to the public.
- Public health burdens in Appalachian communities, with a majority of the impact resulting from increased healthcare costs, injury, and death - **\$74.6 billion** annually
- Emissions of air pollutants - **\$187.5 billion** annually
- Mercury - **\$29.3 billion** annually
- Climate contributions from CO₂ **\$61.7 - \$205.8 billion** annually

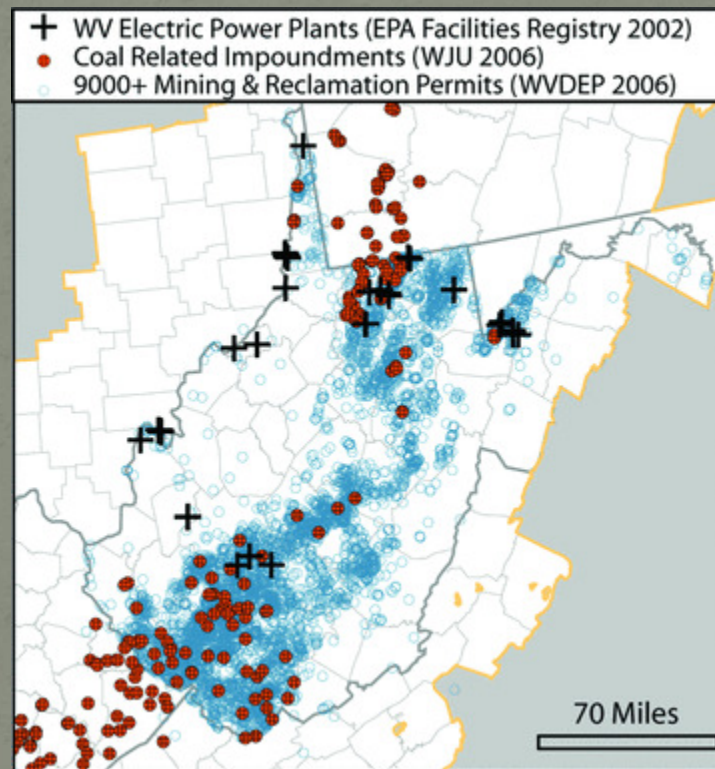
Epstein, 2011 *Annals of the New York Academy of Sciences*

Economic Analysis of Hidden Costs

- The best estimate for the total economically quantifiable costs, based on a conservative weighting of many of the study findings, amount to some **\$345.3 billion**, adding close to **17.8¢/kWh** of electricity generated from coal.
- The low estimate is \$175 billion, or over 9¢/kWh, while the true monetizable costs could be as much as the upper bounds of \$523.3 billion, adding close to 26.89¢/kWh.
- The average residential price of electricity is 12¢/kWh.

Clip from Burning the Future: Coal in America

4:58 -17:45



Recommendations

- 1. Comprehensive comparative analyses of life cycle costs of all electricity generation technologies and practices are needed to guide the development of future energy policies.**
- 2. Begin phasing out coal and phasing in cleanly powered smart grids, using place-appropriate alternative energy sources.**
3. A healthy energy future can include electric vehicles, plugged into cleanly powered smart grids; and healthy cities initiatives, including green buildings, roof-top gardens, public transport, and smart growth.
4. Alternative industrial and farming policies are needed for coal-field regions, to support the manufacture and installation of solar, wind, small-scale hydro, and smart grid technologies.
Rural electric co-ops can help in meeting consumer demands.

5. **We must end MTR mining, reclaim all MTR sites and abandoned mine lands, and ensure that local water sources are safe for consumption.**
6. Funds are needed for clean enterprises, reclamation, and water treatment.
7. Fund-generating methods include: maintaining revenues from the workers' compensation coal tax;
 - a. increasing coal severance tax rates;
 - b. increasing fees on coal haul trucks and trains;
 - c. reforming the structure of credits and taxes to remove misaligned incentives;
 - d. reforming federal and state subsidies to incentivize clean technology infrastructure.
8. To transform our energy infrastructure, we must realign federal and state rules, regulations, and rewards to stimulate manufacturing of and markets for clean and efficient energy systems. Such a transformation would be beneficial for our health, for the environment, for sustained economic health, and would contribute to stabilizing the global climate.

2008 Ohio Clean Energy Law

- Clean Energy Law calls for Ohio's major utilities to
 - save 22 % of sales volume through energy efficiency and
 - generate 12.5 % of electricity from renewable energy by 2025.
- The law sets four separate clean energy requirements, requiring the state's investor-owned utilities to:
 - Save 22 % of sales through efficiency by 2025
 - Reduce peak demand by 1% in 2009 and by 0.75% in each year of 2010-2018
 - Develop or purchase renewable electricity accounting for 12.5% of their sales in 2025
 - Develop or purchase solar electricity accounting for 0.5% of their sales in 2025
- The law sets annual benchmarks for the efficiency, renewables, and solar requirements, beginning with small steps in the first few years and then requiring greater annual savings later, once Ohio's clean energy industry has had time to expand.

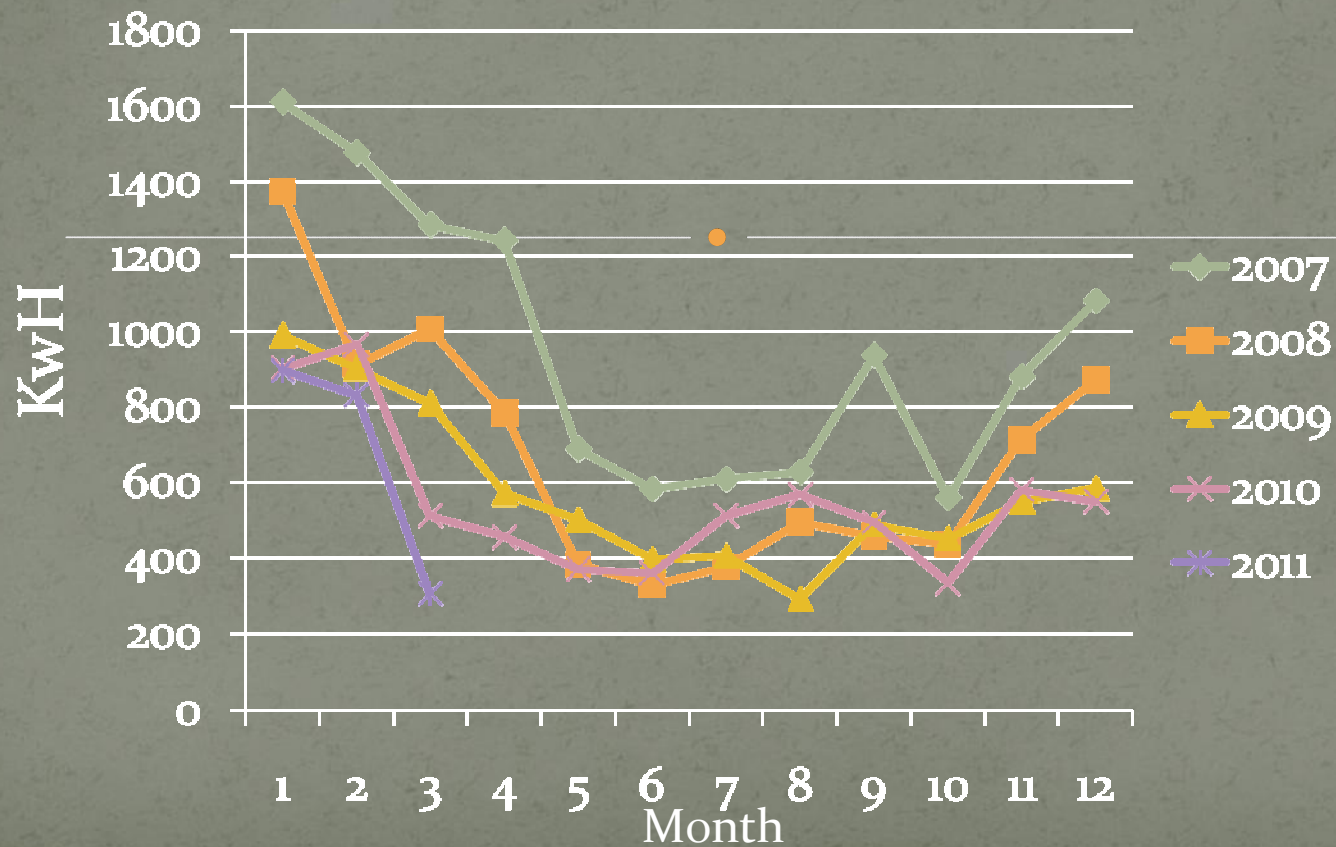
Ohio's Clean Energy Report Card 3/2011

Environment Ohio Research & Policy Center

Ohio has only begun to tap its potential for energy efficiency and renewable energy.

- The American Council for an Energy-Efficient Economy (ACEEE) estimates that Ohio could reduce its energy consumption by 33% by 2025 through cost-effective efficiency measures.
- Energy efficiency is the lowest cost energy resource available to Ohio
- Ambitious energy efficiency efforts have been shown to deliver greater benefits at lower costs to consumers than more modest efforts.
- Ohio has the potential to generate 288,000 gigawatt-hours (GWh) of electricity from wind turbines throughout the state and in Lake Erie, and 34,000 GWh from solar. Combined, Ohio's solar and wind resources could generate enough electricity to power all the state's homes **six times over**.

Ing Household Electricity Use KwH by Month



Energy Savings

Year	KwH	Versus Prior Year	Versus 2007	*Cumulative \$ Saved Versus 2007
2007	11,582	.	.	.
2008	8,146	29.7%	29.7%	\$304.39
2009	6,951	14.7%	40.0%	\$704.92
2010	6,611	4.9%	42.9%	\$1,125.18

* Adjusted for cost of electricity in 2007

Refrigerator Energy

- <http://www.kouba-cavallo.com/refmods.htm>

**Kouba-
Cavallo
Associates,
Inc.
Model Search
Results**



General Electric Refrigerator Models

Size is given in cubic feet, the Energy Rating is in kilowatt-hours per year, and the Adjusted Rating accounts for aging

Model	Year	Size	Style	Defrost Type	Energy Rating	Adjusted Rating
TBF18CV	1977	17.6	Not Available	Not Known	1260	1638
TBF18CV	1979	17.6	Top Freezer	Not Known	1452	1887
TBF18CV	1980	17.59	Top Freezer	Not Known	1277	1660

To close this page, click on the "x" in the upper righthand corner of the page.

153 Green Tips from Bankrate.com

- In small groups review Energy Tips
 - Home #1-30 Group 1
 - Energy #31-44 Group 2
- Household commitments on a GLC Leaf
- Discuss and report :
 - What measures have you already implemented in your home to reduce energy use?
 - What energy-saving measures will you commit to do?
 - What measures can GLC implement?

Some Useful Websites

http://www.energystar.gov/index.cfm?c=products.pr_find_es_product

<http://www.epa.gov/WaterSense/>

<http://www.sfiprogram.org/>

<http://www.greenenergyohio.org>

<http://energizeohio.osu.edu/>

<http://www.dsireusa.org>

<http://www.kouba-cavallo.com/refmods.htm>

<http://michaelbluejay.com/electricity/laundry.html>

Current Opportunities: AEP Appliance Rebate

- **\$50 rebate** on your purchase of an ENERGY STAR qualified clothes washer.
- Purchases made 1/1/2011 - 4/30/2011.
- Limit 1 rebate per residential electric customer account.
- www.aepohio.com

AEP: Appliance Recycling

- Turn in your old appliance through the Appliance Recycling Program and:
 - **Get paid** - receive **\$35** and **free, convenient pickup** of your old appliance.

AEP: CFLs Discounts

- No coupons or rebates needed -- just immediate savings at the register.
- Choose from a variety of CFL bulbs and light fixtures at these participating stores (including Home Depot, Lowe's, Costco, Meijer, Sam's Club and others).
- There is a 12-bulb limit per purchase. Discount is available while supplies last. Must be a member of Costco or Sam's Club to receive a discount at those stores.
- Saturday, March 26th, 10am - 2pm Lowe's
4141 Morse Crossing, Columbus, OH 43219
- Look at www.aepohio.com/save/programs/Lighting

Columbia Gas: Home Energy Audit

- Cost **\$50** (\$20 for income-eligible customers*).
- Fee is reimbursed when you make any qualified energy efficiency improvement.
- Rebates also made for qualified energy efficiency improvements
- Home Energy Auditor analyzes your home to identify ways to make your home more comfortable and energy efficient

Columbia Gas: Home Energy Audit

- Blower door locates and measures air leaks
- Combustion efficiency analyzer (health and safety device) checks gas stoves, furnaces, and water heaters for safety and efficiency
- Infrared photography or “thermal imaging” pinpoints areas of inadequate insulation levels and air leaking leading to wasted heating and cooling costs

Columbia Gas: Home Energy Audit

- Qualified energy efficiency recommendations may include:
 - Attic and wall insulation upgrades
 - Air sealing of cracks, gaps, and holes
 - High-efficiency gas furnace or boiler replacements
- Provide and install an energy-efficient shower head and a programmable thermostat where needed—at no charge.

Columbia Gas: Home Energy Audit

- **Rebates** of up to 70% may be available if you make more than one qualified energy efficiency improvement.
- You could save \$400 on a high-efficiency gas furnace or boiler replacement.
- Greater rebates are available for income-eligible customers.*
- www.columbiagasohio.com

AEP In Home Energy Assessment

- A qualified auditor will conduct a one-hour visual inspection of your home and install the following where applicable:
 - Up to 12 compact fluorescent light bulbs (CFLs)
 - Two low-flow faucet aerators
 - One low-flow shower head
 - One LED night light
 - 5' of pipe wrap
 - Programmable thermostat (except on a heat pump)

AEP: In-Home Energy Assessment

- The auditor will also give you a report detailing ways to improve your home's energy efficiency.
- The auditor will help you choose a contractor to make the recommended energy improvements.
- By implementing the recommended improvements within six months of your audit, you could qualify for rebates from AEP Ohio.

AEP: In-Home Energy Assessment

- The cost of the In-home Energy Assessment is \$25. The value of the energy-saving items alone is over \$100.
- To participate, you can either call a program-approved auditor directly to schedule your appointment or call (877) 856-2454, Monday-Friday, 8:00 am – 7:00 pm, to speak to a representative.

AEP: In-home Energy Audit

- This comprehensive diagnostic audit is performed by a program-approved auditor following Building Performance Institute (BPI) standards.
- This option includes a blower door test that shows the amount of air infiltration in your home and a combustion efficiency test that gauges the efficiency of your appliances and equipment.*
- The systems inspected in this option include:
 - Heating & Air Conditioning
 - Air Sealing
 - Insulation
 - Appliances
 - Lighting
 - Water Heating

AEP: In-home Energy Audit

- You pay the auditor's full cost of the audit, which is typically \$200-\$350. But, we'll reimburse you \$100 if you have an all-electric home or electric heat, or \$75 if you have central air conditioning and non-electric heat.
- To participate in this program, you can either call a program-approved auditor directly to schedule your appointment or call (877) 856-2454, Monday-Friday, 8:00 am – 7:00 pm, to speak to a representative.

Rebate* Chart	All Electric or Electric Heat	Central AC w/Gas
In-home Energy Audit ¹	\$100.00	\$75.00
Pin Based CFL Indoor Fixture ²	\$20.00	\$20.00
Pin Based CFL-Outdoor Fixture ²	\$35.00	\$35.00
CFL Torchieres	\$20.00	\$20.00
Wall Insulation ³	\$200.00	\$75.00
Air Sealing ⁴	\$200.00	\$50.00
Window Film	\$0.00	\$45.00
ENERGY STAR Window Replacement ⁵	\$200.00	\$75.00
Attic Insulation ⁶	\$200.00	\$90.00
Shower Start/Stop ⁷	\$25.00	\$25.00

ENERGY STAR Ceiling Fan	\$20.00	\$20.00
Heat Pump Programmable Thermostat ⁸	\$50.00	\$25.00
Duct Sealing ⁹	\$150.00	\$50.00
RCA Tune Up ¹⁰	\$50.00	\$50.00
Furnace Replacement w/ ECM ¹¹	\$150.00	\$150.00
ENERGY STAR Central Air Conditioning Replacement ¹²	\$100.00	\$100.00
ENERGY STAR Heat Pump Replacement ¹³ - existing HP must be SEER 13 and HSPF 7.7 or less and the new HP have a SEER of 14.5 or greater and an HSPF of 8.5 or greater	\$350.00	\$150.00
Complete System Bonus ¹⁴	\$150.00	\$150.00
Performance Bonus ¹⁵ Assessment \$25 Audit (gas) \$150 Audit (electric) \$200		

Devotion

You are the light of the world.

A city built on a hill cannot be hidden.

No one after lighting a lamp puts it under the bushel basket, but on the lamp stand, and it gives light to all in the house.

In the same way, let your light shine before others, so that they may see your good works and give glory to your Father in heaven.

Matthew 5:14-15

Prayer:

Lord of Light, you have called us to be light for the world. Help us to be lights for the created world, to use light and energy responsibly and to use our resources carefully and wisely. Holy God, you are known in the wind, in the water, in the brightness of the sun. Help us to responsibly use all your power to be the energy which powers our lives. Amen.

