

Home Energy Auditing Home Performance Contracting

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Special Thanks

- Mark Janizek and Robin Mann for the invitation to speak today
- People of Radnor Township and my co speakers for supporting this activity.
- Chandler Von Schroeder from Energy Star
- Our Carbon Killing Crew which is on track to take 500,000 lbs of Carbon out of the air this year
- My Partner, Kimberly Auger, CEO of Hometown Green

Remember.....

- We are going to look at auditing
- An audit has financial implications
- Before then making a recommendation, we like to look at what's at risk for the client
- We start with a macro look at the bills
- Ask the client how much they think their bills will go up on average while they are in their home

Whats at Stake?

The first 5 years in a 15 year look

4 % annual increase

Present

Bills	2010	2011	2012	2013	2014
\$5,489	\$5,709	\$5,937	\$6,174	\$6,421	\$6,678

Whats at Stake?

The 2nd 5 years in a 15 year look

2015	2016	2017	2018	2019	2020
\$6,945	\$7,223	\$7,512	\$7,813	\$8,125	\$8,450

Whats at Stake?

The 3rd 5 years in a 15 year look

2021	2022	2023	2024	2025	Total
\$8,788	\$9,140	\$9,505	\$9,885	\$10,281	\$130,076

What is the context for this investment?

Converging factors:

- Mar 2008 Price of oil begins to drop
- July 2008 PA House Bill 1: Efficiency & Solar Money appropriated
- Summer 2008 Markets begin to drop: People look for other places to invest their money & turn to their homes
- September 2008 PA House Bill 2200: smart metering
- October 2008 U.S. Senate extends/expands U.S. Tax credits: opens door for solar, Wind, heating, DHW

Continuing Context

Converging factors:

- January 2009 PUC & Act 129 Efficiency requirements: Utilities have to cut demand on the Grid...CSP's created
- January 2009 Economic picture worsens and solar panel prices drop.
- February 2009 Federal Stimulus Plan proposal hits the street
- February 2009 KeystoneHelp unveils new program using monies appropriated with PA House Bill 1.
- March 2009 Interest rates are low making higher ROI on home measures attractive to home owners.

Context For the Client

Factors to consider:

- Change has payback every month in long run and may never be cheaper than now
- Market has some *High Quality Contractors with Control Elements* in it which are recognizable
 - **PA Home Energy** is monitoring energy auditors & home performance contractors
 - Keystone Help is monitoring HVAC, auditors, geo, & wind IF you go through their program
- Snake oil salesman are generally not in programs:
CONFIRM NATIONAL PROGRAM CERTIFICATIONS
- State DEP is monitoring Solar programs
- **HPWES rules are firm: go with a HPWES program**

Good Research will Show (1)...

Precursors to Efficiency

- a. Conservation (Reduce)
- b. Second use (Reuse)
- c. New use (Recycle)



Good Research Will Show (2).....

- Efficiency is about *Life Cycle Costs*... A good HPWES audit will save you more for a longer time than a poor cheap audit!
- Start with a HPWES energy audit
 - House as a system approach
 - Computer modeling ensures no snake oil salesman
 - Ensures tax credits are legitimate
 - Ensures predictable results/sound investment
 - Ensures a test out & a HERS Certificate



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Good Research Will Show (3)....

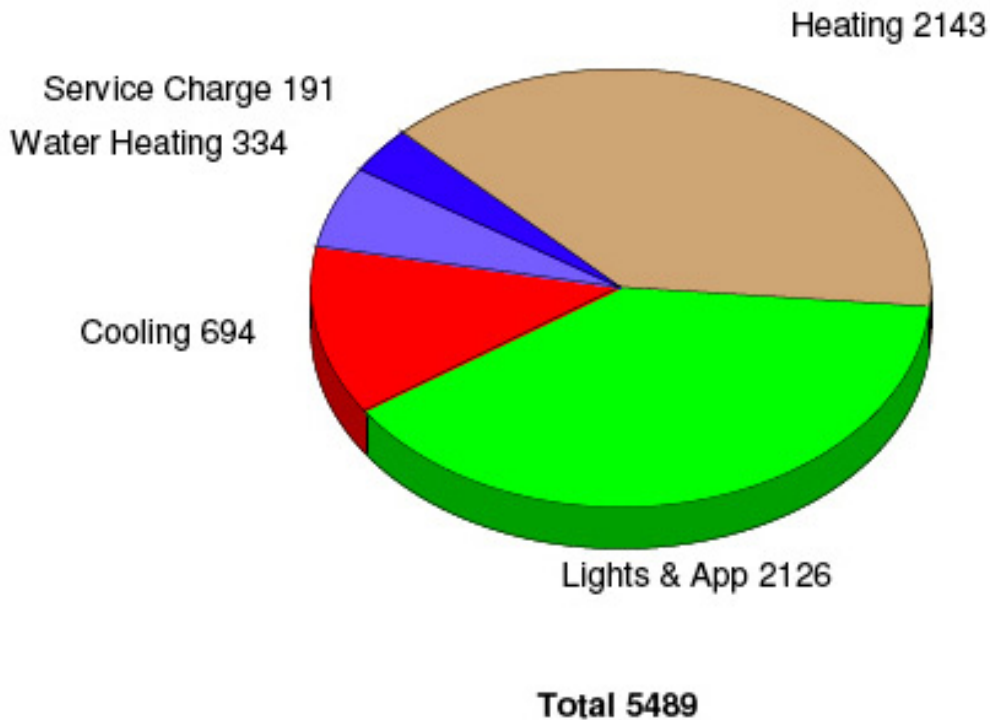
- Pre Equipment Processes
 - a. Air sealing to ASHRAE specs is usually a large factor. *Can only be done by **certified** personnel.*
 - b. Insulate **AFTER** sealing: low VOC, low embodied energy
 - c. House relationships with sun, wind, rain, snow, topography, vegetation, & people all can be modified)
 - d. Water flow control @ sinks, showers, & toilets
- Equipment...Energy Star only for credits
 - Install appliances & CFL/ LED / day lighting / solar tubes
 - Use renewables or HE for HVAC & hot water
 - Use renewables to produce power / reduce needs

Since it's Supper Time.....



Lets Look at Pie: A client home before

Annual Energy Cost (\$/yr)



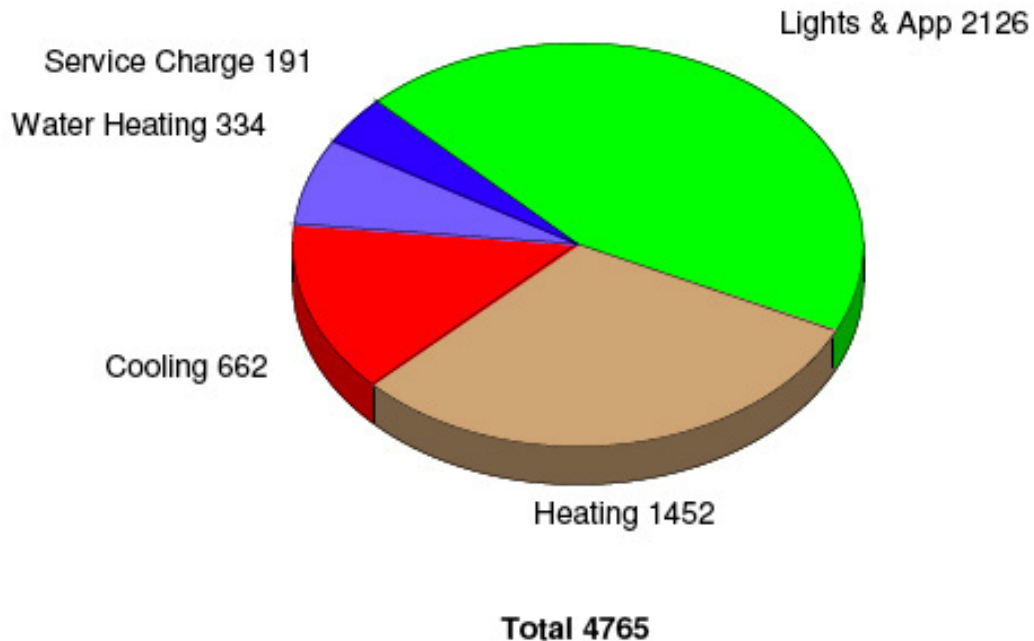
Total Emissions

Type of Emissions

Carbon Dioxide (CO2) - tons/year	21.8
Sulfur Dioxide (SO2) - lbs/year	169.9
Nitrogen Oxides (NOx) - lbs/year	57.8

Reduce Home Shell Need for Energy

Annual Energy Cost (\$/yr)



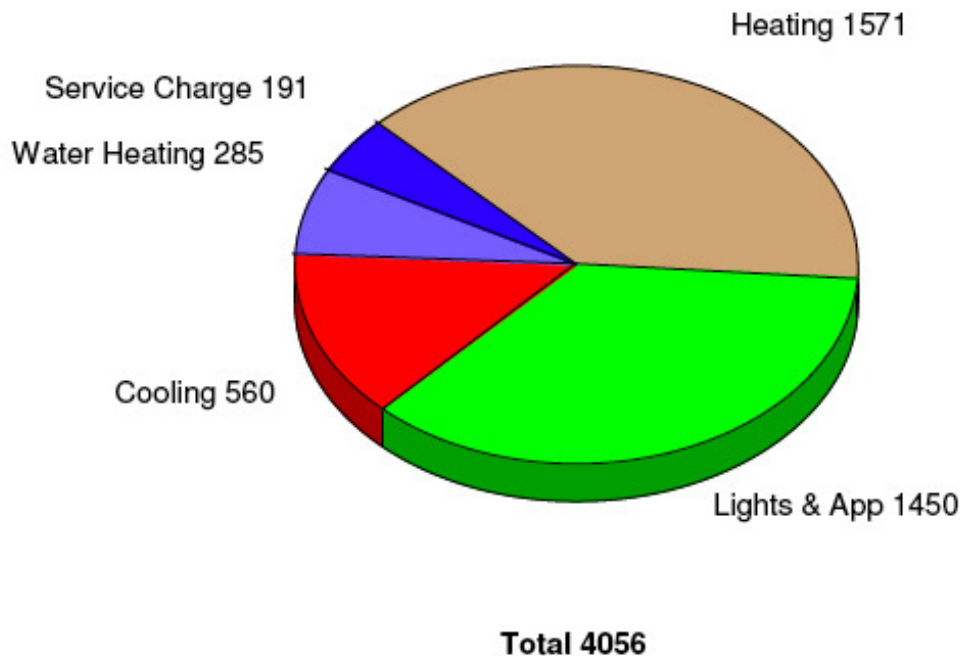
Total Emissions

Type of Emissions

Carbon Dioxide (CO ₂) - tons/year	18.6
Sulfur Dioxide (SO ₂) - lbs/year	166.0
Nitrogen Oxides (NO _x) - lbs/year	49.9

Reduce Light & Appliance Needs

Annual Energy Cost (\$/yr)



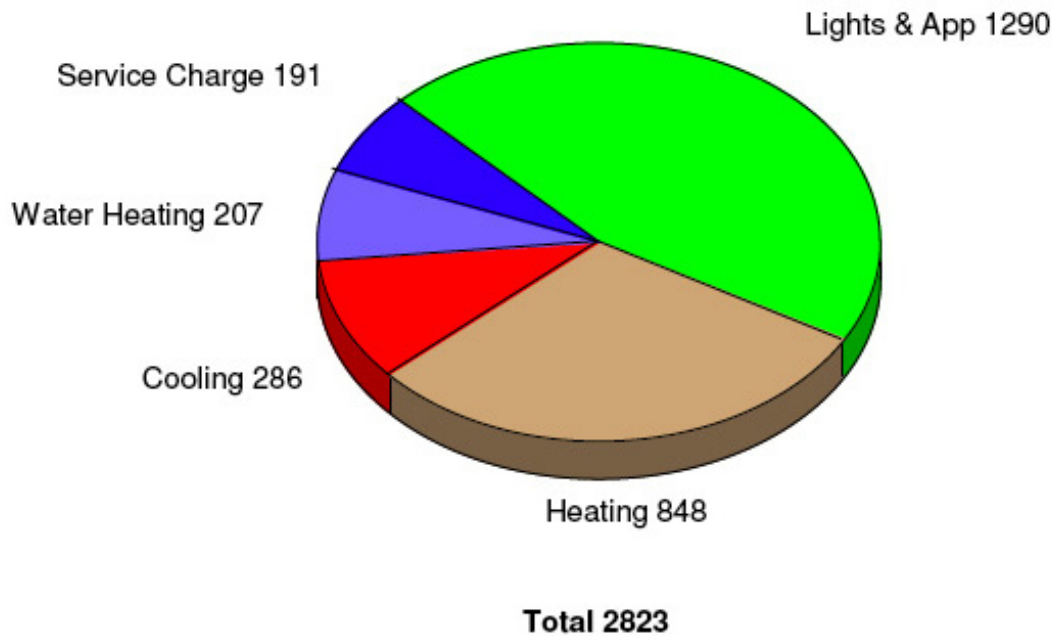
Total Emissions

Type of Emissions

Carbon Dioxide (CO ₂) - tons/year	15.9
Sulfur Dioxide (SO ₂) - lbs/year	122.6
Nitrogen Oxides (NO _x) - lbs/year	42.3

Change HVAC to Renewable or HE System

Annual Energy Cost (\$/yr)



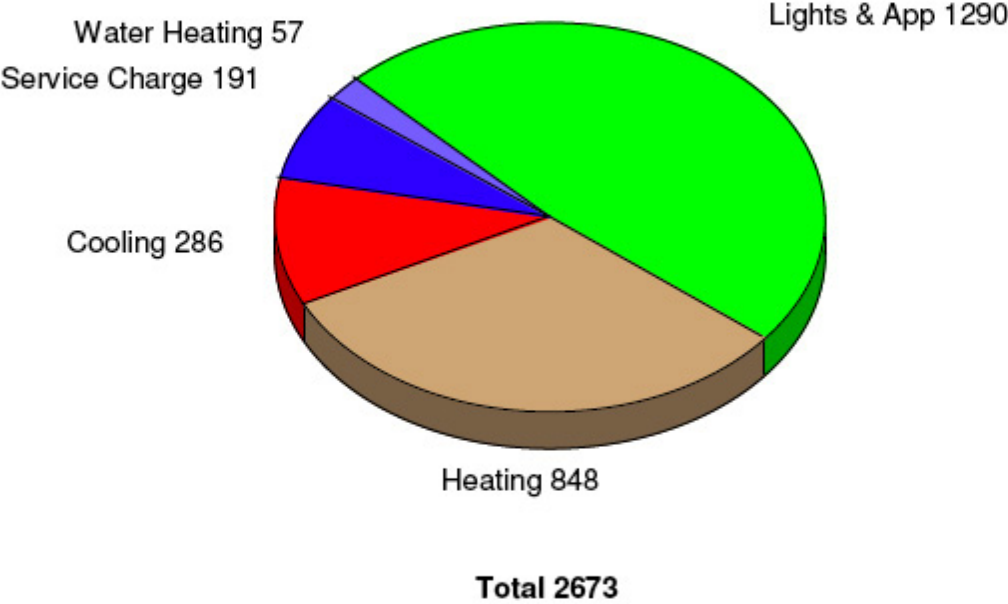
Total Emissions

Type of Emissions

Carbon Dioxide (CO ₂) - tons/year	12.3
Sulfur Dioxide (SO ₂) - lbs/year	170.3
Nitrogen Oxides (NO _x) - lbs/year	34.3

Use Renewable or Tankless or Solar Hot Water

Annual Energy Cost (\$/yr)

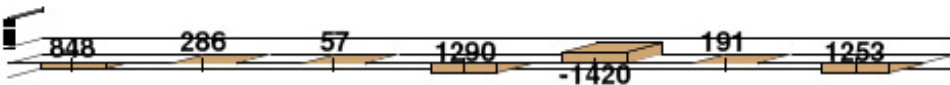


Total Emissions

Type of Emissions	Total Emissions
Carbon Dioxide (CO2) - tons/year	11.7
Sulfur Dioxide (SO2) - lbs/year	170.3
Nitrogen Oxides (NOx) - lbs/year	32.6

Offset remaining Electricity with Renewables: Net Bills \$1253 per year

Annual Energy Cost



Total Emissions

Type of Emissions

Carbon Dioxide (CO ₂) - tons/year	5.4
Sulfur Dioxide (SO ₂) - lbs/year	74.6
Nitrogen Oxides (NO _x) - lbs/year	14.9

Remember that time line?

Does Green Cost too Much?

4 % annual increase

Present Bills	2010	2011	2012	2013	2014
\$5,489	\$5,709	\$5,937	\$6,174	\$6,421	\$6,678
\$1,253	\$1,303	\$1,355	\$1,409	\$1,466	\$1,524

Does Green Cost too Much?

2015 2016 2017 2018 2019 2020

\$6,945 \$7,223 \$7,512 \$7,813 \$8,125 \$8,450

\$1,585 \$1,649 \$1,715 \$1,783 \$1,855 \$1,929

Does Green Cost too Much?

2021	2022	2023	2024	2025	Total
\$8,788	\$9,140	\$9,505	\$9,885	\$10,281	\$130,076
\$2,006	\$2,086	\$2,170	\$2,257	\$2,347	\$29,693
Max tax net investment @ 4%					\$100,383

Lets look at The Gross Costs?

Shell Efficiency	\$10K
Lighting	\$ 3K
Dual Fuel Heat pump	\$11K
7K in solarPV	\$56K
7K in solar H2O	
Gross cost of all work	\$87K

Lets look at the Net Costs?

\$70,200 after solar tax credit

\$54,450 after state solar PV rebate

\$52,950 after credit for insulation

\$52,650 after PECO rebate for efficiency

\$50,550 after Solar H2O Credit

\$48,550 after PA Sunshine rebate on H2O

Lets look at Return on Investment?

\$4236 per year income

on a \$48,550 investment

This is an 8.7% return on investment

How Do I Pay For All of This ?

- Loan payment + new bills < old bills
- Utility increases in future increase property values if using efficiency *OR* renewables
- Zero down payment subsidized loans as low as 3.875% if you use an auditor
- Federal Tax Credits

For Efficiency Improvements, you do not need money in Pennsylvania!!!!

- Keystone Help program

- Three tiers of contractors:

- Approved no EE training
- Preferred 1 day of EE training
- Certified Dual RESNET and BPI Certified



Secured loans

- Payments only restricted as a usual loan would be

- Unsecured loans

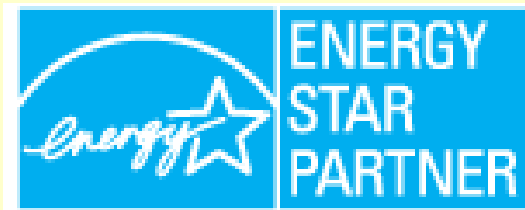
- Payments may be restricted by energy savings

So, How do I make the right choice?

1. Look for claims of membership in valid organizations
2. VERIFY CLAIMS at organization website...BPI is difficult
3. Ask for References
4. Ask for insurance certificate
5. Ask for State GC license



To Keep From Making a large mistake.....



Find This List of Resources at

www.HometownGreen.net

STATE & LOCAL RESOURCES

- www.PAHOMEENERGY.org
- www.keystonehelp.org
- www.sbnphiladelphia.org
- www.dvgbc.org



NATIONAL RESOURCES

- http://www.energystar.gov/index.cfm?c=products.pr_tax_credits
- www.BPI.org
- www.Natres.org
- www.greenadvantage.org
- www.terrapass.org
- www.energystar.gov
- www.encyclopedia.com
- www.efficiencyfirst.org