PHRC Webinar Series | Tuesday, January 16th @ 1pm

Residential Energy Auditing 101

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Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.

Description

- Whether it's a homeowner looking to save energy costs, a utility striving for permanent energy usage reductions in its territory, or a designer confirming a home is meeting its intended energy performance, there are several approaches to residential energy auditing to achieve various goals. This webinar will explore the various reasons for commissioning a residential energy audit, the associated energy auditing process, and the final product for those end goals.

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Learning Objectives

- Explore the differences between walkthrough audits, comprehensive audits, and energy monitoring and evaluation for existing residential buildings.
- Examine the impacts on energy usage and indoor air quality for occupants when developing and implementing energy conservation measures.
- Understand the environmental impacts of site energy reductions and renewable energy implementation on source energy consumption.
- Gain insight on energy and home safety evaluation tools used during energy auditing and monitoring processes.

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Outline

- **Introduction to Residential Energy Audits & Residential Energy Management**
- **Overview of Residential Energy Audit Products**
  - Details of Walkthrough Residential Energy Audits
  - Details of Comprehensive Residential Energy Audits
- **Step by Step through Residential Energy Audit Process**

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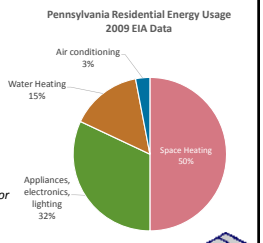
What is a Residential Energy Audit?

- **Snapshot evaluation of an existing home's actual energy usage**
- **One-time assessment of how to:**
  - Decrease source & site energy usage
  - Save money
  - Increase comfort and/or safety
  - Reduce environmental impact
- **Organized into recommended:**
  - Energy Conservation Measures (ECMs)
  - Energy Efficiency Measures (EEMs) *and/or*
  - Renewable Energy Opportunities



U.S. Energy Information Administration (EIA). (2013). *Household Energy Use in Pennsylvania.* Retrieved from https://www.eia.gov/consumption/residential/reports/2009/state_briefs/pdf/pa.pdf

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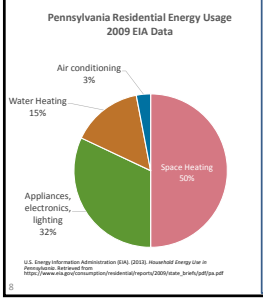
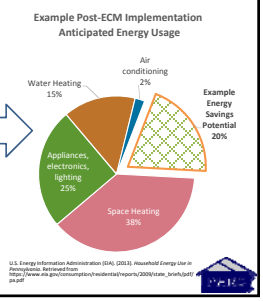
What is a Residential Energy Audit?





U.S. Energy Information Administration (EIA). (2013). *Household Energy Use in Pennsylvania.* Retrieved from https://www.eia.gov/consumption/residential/reports/2009/state_briefs/pdf/pa.pdf

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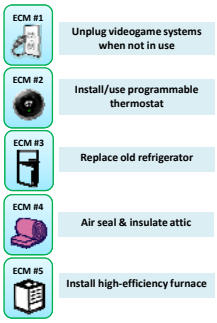
Energy Conservation Measures



- **Defined project/action that optimizes:**
  - Operating cost
  - Initial cost
  - Occupant comfort
  - Occupant safety
  - Environmental impact
- **Goals:**
  - Decrease source & site energy usage
  - Save money
  - Increase comfort and/or safety
  - Reduce environmental impact

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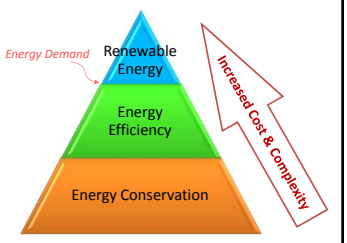
Approach – Energy Pyramid

ECM #1	Conservation	Unplug videogame systems when not in use
ECM #2	Conservation / Efficiency $	Install/use programmable thermostat
ECM #3	Efficiency $$	Replace old refrigerator
ECM #4	Efficiency $$$	Air seal & insulate attic
ECM #5	Efficiency $$$$	Install high-efficiency furnace



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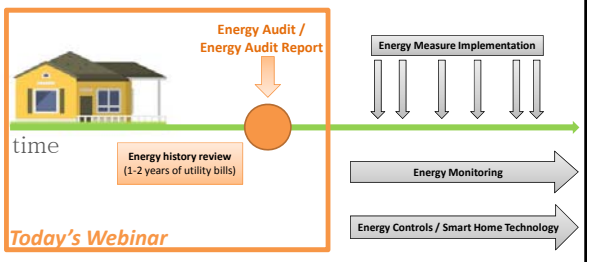
Residential Energy Management Overview



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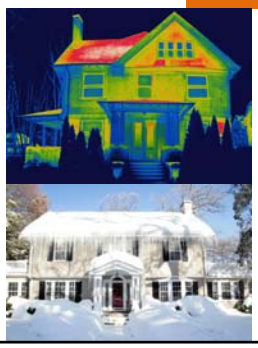
Why Get an Energy Audit



- High energy bills
- Comfort issues
- Safety concerns
- Moisture/mold issues

- Anticipated renovations
- Utility rebates
- Evaluate environmental impact

Top: http://ngm.nationalgeographic.com/2009/03/energy-conservation/miller-text
Bottom: http://theclimatechief.com/albany-ice-dam-removal/

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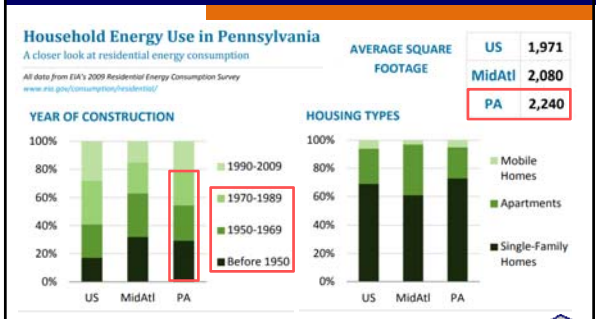
Energy Usage in Pennsylvania Homes



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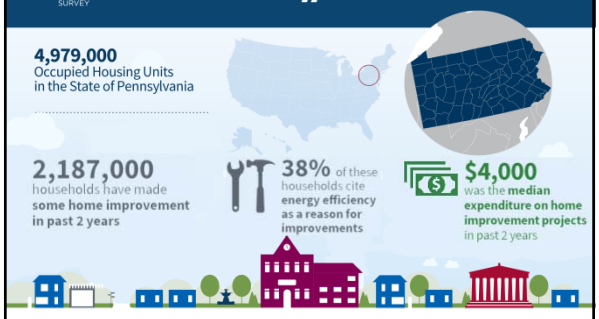
AMERICAN HOUSING SURVEY 2015 RESULTS // STATE OF PENNSYLVANIA



https://www2.census.gov/programs-surveys/ahs/2015/factsheets/2015%20Housing%20Profile%20Pennsylvania.pdf

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Energy Audit Products

	Walkthrough Energy Audit	Comprehensive Energy Audit
Other Names	Simple Energy Audit Checklist Energy Audit Home Energy Survey	General Energy Audit Standard Energy Audit Detailed Energy Audit
Typical Cost	$0 - $100	$300 - $800
Visual Inspection?	Yes	Yes
Diagnostic Tools?	No	Yes
Renewable Evaluation?	Sometimes	Sometimes
Utility Bill Review?	Sometimes	Yes
Energy Modeling?	No	Yes
Cost/payback details?	No	Yes
Report Detail	Ranked list of general energy measures	Ranked list of more detailed energy measures with cost/payback
HERS Score / Home Energy Score?	Sometimes	Sometimes

Who Does Energy Audits?

	Walkthrough Energy Audit	Comprehensive Energy Audit
Other Names	Simple Energy Audit Checklist Energy Audit Home Energy Survey	General Energy Audit Standard Energy Audit Detailed Energy Audit
Reasons to Get This Energy Audit Product	High energy bills Anticipated renovations Utility rebates (appliances, etc.) Evaluate environmental impact	High energy bills Comfort issues Safety concerns Moisture/mold issues Anticipated renovations Utility rebates (energy audit, etc.) Evaluate environmental impact
Who Does Them?	Energy Consultants Contractors / Remodelers Design Professionals Students Self	Energy Consultants Contractors / Remodelers Design Professionals
Minimum Required Certification	None	BPI Energy Auditor RESNET Certified HERS Rater
Suggested Minimum Certification	RESNET Home Energy Survey Professional (HESP)	

Variation of Energy Auditing Services

Walkthrough — **Comprehensive**

Results from a 500+ response survey of Home Energy Auditors (October 2011)

96% of respondents had BPI *credentials*

www.bpi.org/sites/default/files/ANSI-BPI-1100-T-2014%20Home%20Energy%20Auditing%20Standard.pdf

www.resnet.us/professional/standards/2014QH12WebPost.pdf

Palmer, K. Walls, M., Gordon, H. and Gerarden, T. (2011). *Assessing the Energy-Efficiency Information Gap: Results from a Survey of Home Energy Auditors*. Resources for the Future, http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.331.9989&rep=rep1&type=pdf, accessed 9 January 2018.

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Energy Audit Process

General Structure

Pre-Assessment Data Collection → Onsite assessment → Energy Analysis → Written Energy Audit Report

Walkthrough

Utility bill request/review *Sometimes* → Visual / Checklist assessment *No diagnostic testing* → General ECM identification *No energy modeling* → Ranked list of general ECMs

Comprehensive

Utility bill request/review → Visual / Diagnostic assessment - Blower door test - Combustion Analysis - Infrared Camera → More detailed ECM identification + financials - Energy modeling - Utility Bill evaluation → Ranked list of detailed ECMs with expected paybacks

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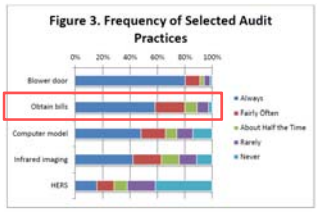
Step 1: Pre-Assessment Data Collection

Pre-Assessment Data Collection

Walkthrough — Utility bill request/review Sometimes

Comprehensive — Utility bill request/review

Results from a 500+ response survey of Home Energy Auditors (October 2011)



Palmer, K. Walls, M., Gordon, H. and Gerarden, T. (2011). *Assessing the Energy-Efficiency Information Gap: Results from a Survey of Home Energy Auditors*. Resources for the Future, http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.231.9989&rep=rep1&type=pdf, accessed 9 January 2018.

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Step 1: Pre-Assessment Data Collection

Pre-Assessment Data Collection

Walkthrough — Utility bill request/review Sometimes

Comprehensive — Utility bill request/review

AMERICAN HOUSING SURVEY 2015 RESULTS // ENERGY BURDEN

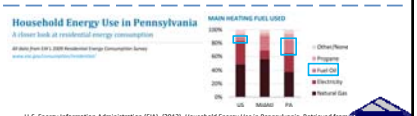
Nationwide Energy Overview — Type of fuel used

99.9% Electricity · 67.9% Gas · 6.4% Fuel Oil

Nationwide Energy Costs — Median monthly costs for…

$133 FUEL OIL · $53 GAS · $29 OTHER FUEL · $104 ELECTRICITY

https://www2.census.gov/programs-surveys/ahs/2015/infographs/2015%20Housing%20Profile%20Energy.pdf



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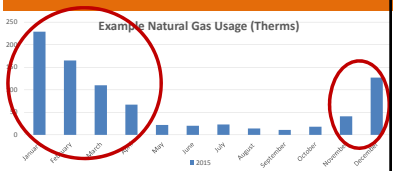
Example Energy Bill Pre-Assessment

Pre-Assessment Data Collection

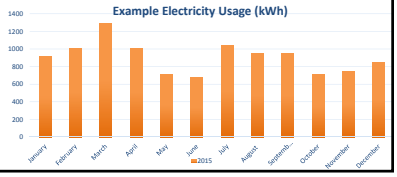
Walkthrough — Utility bill request/review Sometimes

Comprehensive — Utility bill request/review



Home's Systems

1) Primary Heating Fuel: Natural Gas (NG)



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Example Energy Bill Pre-Assessment

Pre-Assessment Data Collection

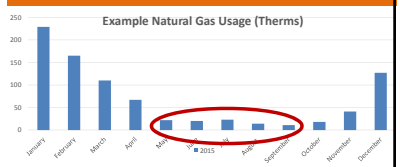
Walkthrough — Utility bill request/review Sometimes

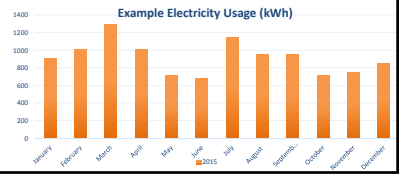
Comprehensive — Utility bill request/review

Home's Systems

1) Primary Heating Fuel: Natural Gas (NG)

2) NG hot water heater and/or NG stove





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Example Energy Bill Pre-Assessment

Pre-Assessment Data Collection

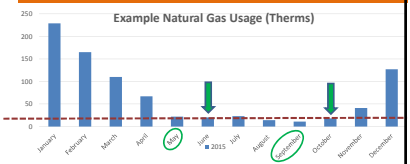
Walkthrough — Utility bill request/review Sometimes

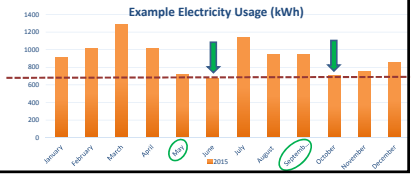
Comprehensive — Utility bill request/review

Home's Systems

1) Primary Heating Fuel: Natural Gas (NG)

2) NG hot water heater and/or NG stove





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Example Energy Bill Pre-Assessment

Pre-Assessment Data Collection

Walkthrough — Utility bill request/review Sometimes

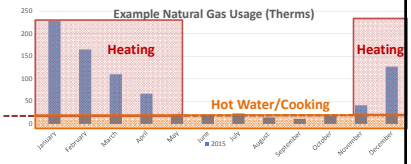
Comprehensive — Utility bill request/review

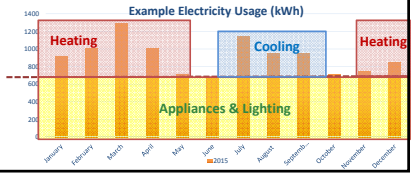
Home's Systems

1) Primary Heating Fuel: Natural Gas (NG)

2) NG hot water heater and/or NG stove

3) Cooling system





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Site & Source Energy Conversion

Pre-Assessment Data Collection

Walkthrough — Utility bill request/review Sometimes

Comprehensive — Utility bill request/review

Fuel Type	Unit	Site BTUs per Unit	Source Energy Conversion Factor	Source BTUs per Unit
Electricity	Kilowatt Hour (kWh)	3,412	3.14	10,714
Natural Gas	Therm	100,000	1.05	105,000
Fuel Oil (No. 2)	Gallon	138,500	1.01	139,885
Propane	Gallon	91,333	1.01	92,246
Kerosene (No. 1)	Gallon	134,000	1.01	135,340
Coal (Anthracite)	(Short) Ton	26,000,000	1.00	26,000,000
Wood	Cord	~20,000,000 (varies)	1.00	~20,000,000 (varies)

https://www.eia.gov/energyexplained/index.cfm?page=about_energy_units

portfoliomanager.energystar.gov/pdf/reference/Source%20Energy.pdf

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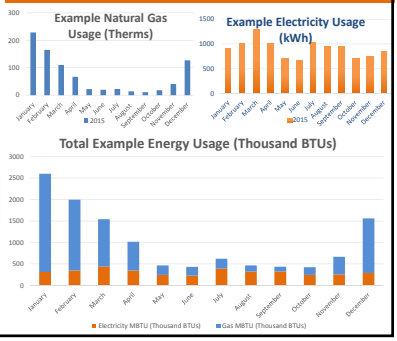
Example Energy Bill Pre-Assessment

Pre-Assessment Data Collection

Walkthrough — Utility bill request/review Sometimes

Comprehensive — Utility bill request/review

Fuel Type	Unit	BTUs per Unit
Electricity	Kilowatt Hour (kWh)	3,412
Natural Gas	Therm	100,000



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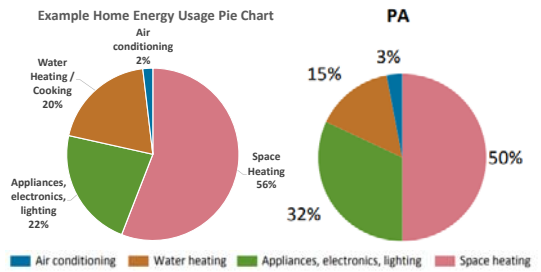
Energy Usage in Pennsylvania Homes



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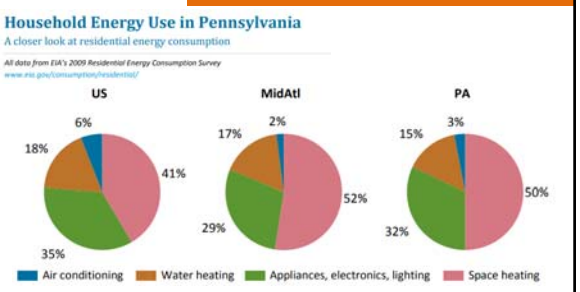
Energy Usage in Pennsylvania Homes



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Heating Degree Days

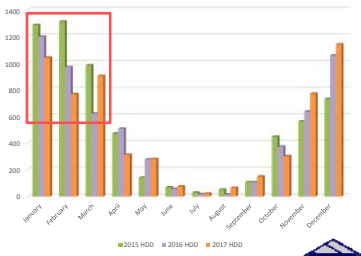
Pre-Assessment Data Collection

	2015 HDD	2016 HDD	2017 HDD
January	1284	1197	1040
February	1310	968	766
March	982	620	902
April	470	506	310
May	140	276	278
June	68	57	75
July	29	18	21
August	51	16	64
September	106	106	149
October	446	371	300
November	561	635	769
December	729	1056	1139
TOTAL	6176	5826	5813

6% fewer HDD between 2015 & 2016

0.22% fewer HDD between 2016 & 2017

State College Heating Degree Days (Base 65F)
2015, 2016, and 2017



KUNV Weather Data. www.degreedays.net

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Cooling Degree Days

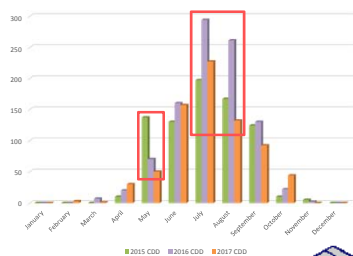
Pre-Assessment Data Collection

	2015 CDD	2016 CDD	2017 HDD
January	0	0	0
February	0	0	3
March	0	7	1
April	10	20	30
May	137	70	50
June	130	160	157
July	197	294	227
August	167	261	132
September	124	130	92
October	10	22	44
November	5	2	0
December	0	0	0
TOTAL	780	966	736

23.8% greater CDD between 2015 & 2016

23.6% fewer CDD between 2016 & 2017

State College Heating Degree Days (Base 65F)
2015, 2016, and 2017



KUNV Weather Data. www.degreedays.net

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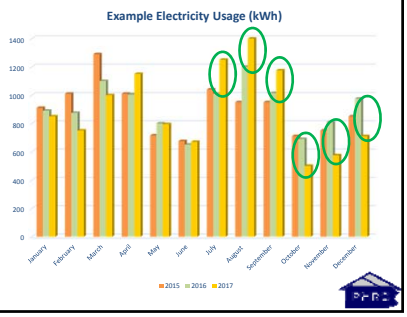
Example Use Patterns

Pre-Assessment Data Collection



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Site Energy Conversion & Costs

Pre-Assessment Data Collection

Walkthrough — Utility bill request/review Sometimes

Comprehensive — Utility bill request/review

Fuel Type	Unit	Site BTUs per Unit	Cost per Unit (Supply)	Cost per Unit (Delivery)	Cost per Million BTU (MMBTU)
Electricity	Kilowatt Hour (kWh)	3,412	$0.06	$0.03	$18.67
Natural Gas	Therm	100,000	$0.45	$0.64	$4.50
Fuel Oil (No. 2)	Gallon	138,500	$2.65	?	$19.13
Propane	Gallon	91,333	$3.20	?	$35.04
Kerosene (No. 1)	Gallon	134,000	$3.15	?	$23.51
Coal (Anthracite)	(Short) Ton	26,000,000	$217.50	?	$8.37
Wood	Cord	~20,000,000 (varies)	varies	?	-

https://www.eia.gov/energyexplained/index.cfm?page=about_energy_units

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Step 2 - Onsite Assessment

	Walkthrough Energy Audit	Comprehensive Energy Audit
Visual Inspection?	Yes	Yes
Diagnostic Tools?	No	Yes
Renewable Evaluation?	Sometimes	Sometimes
Goals	1 - **Find opportunities for energy conservation, efficiency, and/or renewable energy** (*general*) 2 - **Identify any health/safety/ moisture concerns** *(general)*	1 - **Find opportunities for energy conservation, efficiency, and/or renewable energy** (*detailed*) 2 - **Identify any health/safety/ moisture concerns** *(detailed)* 3 - **Examine details for energy modeling and cost implications for ECM implementation**

Step 2 - Onsite Assessment

Onsite assessment

- **Visual Inspection (interior & exterior) of every major building system**
  - **Building Envelope**
    - Attic/Roof
    - Walls
    - Doors/Windows/Penetrations
    - Basement/Crawlspace
  - **HVAC & Hot Water Systems**
    - Equipment
    - Distribution
    - Controls
  - **Lighting**
  - **Appliances**
  - **Other Loads** (hot tub, etc.)

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Diagnostic Tools – Blower Door

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Diagnostic Tools – Combustion Analysis

https://testohvac.wordpress.com/2009/07/30/residential-combustion-analysis/

https://www.testo.com/en-US/testo-330-1-lx/p/400563-3304

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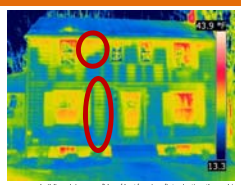
Diagnostic Tools – Infrared Camera

http://charlestonecorealtor.com/2015/01/lower-heating-costs/thermal-house-2/



www.greenbuildingadvisor.com/blogs/dept/musings/introduction-thermal-imaging

http://activerain.com/blogview/2424157/centerville-utah-infrared-home-inspections-provided-by-utah-infrared-inspections

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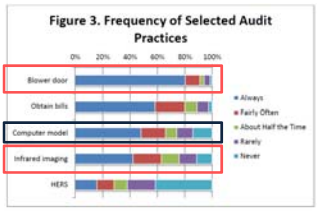
Variations in Energy Audits

Onsite assessment

Walkthrough — Visual / Checklist assessment; *No diagnostic testing*

Comprehensive — Visual / Diagnostic assessment; - Blower door test; Combustion Analysis; - Infrared Camera

Results from a 500+ response survey of Home Energy Auditors (October 2011)



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HVAC System – Boiler

Onsite assessment

	Walkthrough	Comprehensive
Visual Inspection Notes	Primary Heating Equipment: **Boiler** Fuel: **Fuel Oil** Age: **~1960** (original) Efficiency: **74%** (onsite notes/specs)	Vent: **Atmospheric** Pump age: **~1960** (original)
Health/Safety /Moisture Notes	- Carbon monoxide detector installed - No asbestos pipe wrap found - No leaks in oil tank	- Carbon monoxide detector past 10 year useful lifespan; replace immediately
Diagnostic Tests		- No CO leaks (**0 ppm** tested) - Venting system good - Draft pressure good - Efficiency: **73%** (tested)

39

Building Envelope - Attic

Onsite assessment

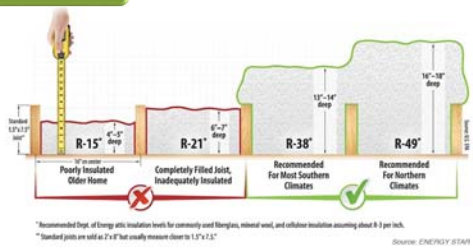
http://centralmissouri.crittercontrol.com/residential/home-services.html

http://www.homeinsulations.co.za/insulation/135mm-aerolite/

40

Building Envelope - Insulation

Onsite assessment



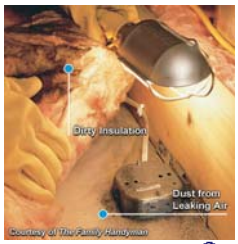
https://insulationinstitute.org/im-a-homeowner/about-insulation/how-much-do-i-need/

41

Building Envelope – Air Sealing

Onsite assessment

https://blog.epa.gov/blog/wp-content/uploads/2015/03/attic1.jpg



www.energystar.gov/index.cfm?c=home_sealing.hm_improvement_attic

42

Building Envelope - Details

Onsite assessment

https://www.thedryingco.com/insulation/photo-gallery/17352-album-barhamsville-attic-clean-out.html

43

Building Envelope – Health/Safety/Moisture

Onsite assessment

www.diychatroom.com/f9/persistent-leak-chimney-roof-35327/

aponke.us/riveting-mold-in-basement/mold-in-basement-removal-raleigh-asbestos/

44

Building Envelope – Health/Safety/Moisture

Onsite assessment

https://www.mass.gov/service-details/bats-in-the-home

45 http://pestkill.org/rodents/rats/in-attic/

Building Envelope – Health/Safety/Moisture

Onsite assessment

http://people.virginia.edu/~fjb2c/

46

Building Envelope – Health/Safety/Moisture

Onsite assessment

https://pittsburghcitywide.com/2013/10/07/pittsburghs-knob-and-tube-epidemic/

www.ncwhomeinspections.com/Knob+and+Tube+Loom

http://www.houstoninspector.com/node/47

47

Building Envelope

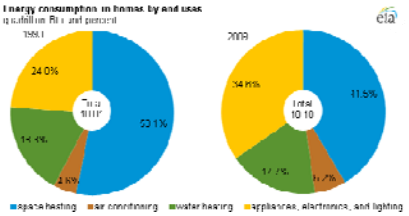
Onsite assessment

http://www.greenbuildingadvisor.com/blogs/dept/musings/introduction-thermal-imaging

48

Appliance Energy Usage – Increased Use

Heating and cooling no longer majority of U.S. home energy use – *March 7, 2013*

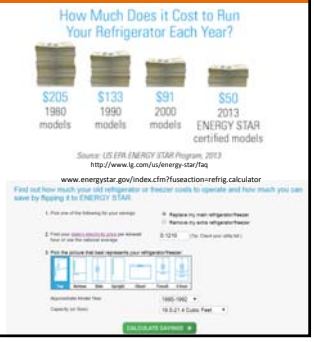


U.S. Energy Information Administration (EIA). (2013, March 7). *Heating and cooling no longer majority of U.S. home energy use*. Retrieved from https://www.eia.gov/todayinenergy/detail.php?id=10271&src=%E2%80%B9%20Consumption%20%20%20%20%20%20Residential%20Energy%20Consumption%20Survey%20(RECS)-f4

49

Appliance Energy Usage - Refrigerators

http://www.dailymail.co.uk/news/article-1323338/Still-chilling-58-years-Britains-oldest-fridge-shows-signs-freezing-up.html



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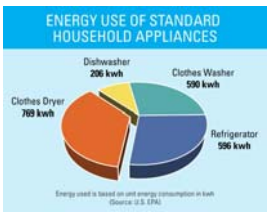
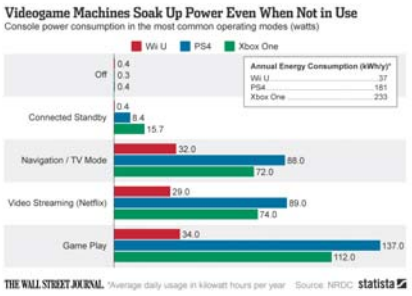
Appliance Energy Usage - Laundry



https://www.energystar.gov/sites/default/files/assets/images/ES_Appliance_Energy_Use_pie_graph_8%2022%2014-large.jpg

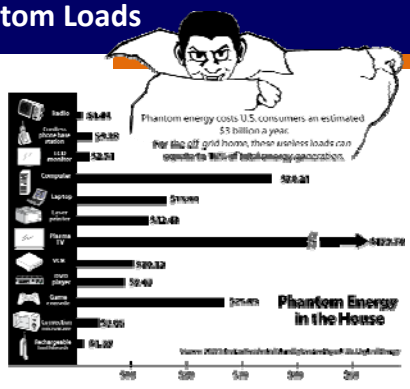
51

Appliance Energy Usage – Videogame Systems



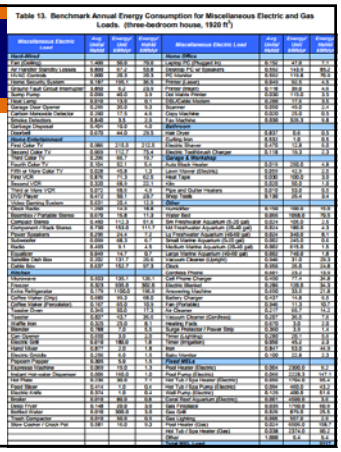
https://www.statista.com/chart/2286/videogame-machines-soak-up-power-even-when-not-in-use/

Phantom Loads



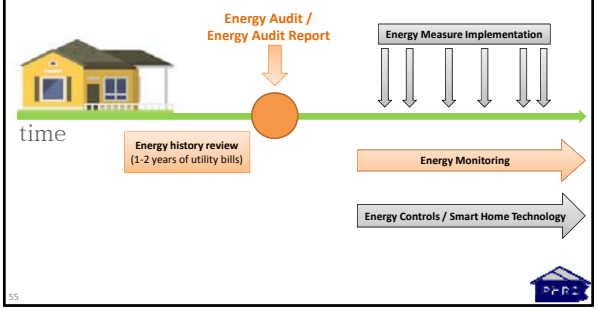
https://www.pakwheels.com/forums/t/make-your-ups-last-longer-in-load-shedding-with-these-simple-tips/225166

Miscellaneous Electric Loads



Hendron, R. (2006). ***Building America Research Benchmark Definition, Updated December 15, 2006***. DOE Building Technologies Program. https://www1.eere.energy.gov/buildings/publications/pdfs/building_america/40968.pdf, accessed 9 January 2018.

Residential Energy Management Overview



55

Renewable Energy Evaluation

Onsite assessment

https://www.solarpathfinder.com/PF

https://www.google.com/get/sunroof#p=0

Step 3: Energy Analysis

	Walkthrough Energy Audit	Comprehensive Energy Audit
Other Names	Simple Energy Audit Checklist Energy Audit Home Energy Survey	General Energy Audit Standard Energy Audit Detailed Energy Audit
Typical Cost	$0 - $100	$300 - $800
Utility Bill Review?	Sometimes	Yes
Energy Modeling?	No	Yes
Cost/payback details?	No	Yes
Report Detail	Ranked list of general energy measures	Ranked list of more detailed energy measures with cost/payback
HERS Score / Home Energy Score?	Sometimes	Sometimes

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Energy Modeling

Energy Analysis

Walkthrough — General ECM identification — *No energy modeling*

Comprehensive — More detailed ECM identification + financials — - Energy modeling - Utility Bill evaluation

https://studentenergysim.wordpress.com/download-software-2/

Energy Modeling Purpose

- Get more accurate initial energy use profiles
- Evaluate multiple retrofit options
- Get more accurate energy savings for identified ECM(s)
- Properly take into account systems-level interaction

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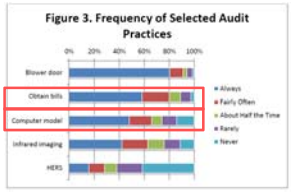
Step 3: Energy Analysis

Energy Analysis

Walkthrough — General ECM identification — *No energy modeling*

Comprehensive — More detailed ECM identification + financials — - Energy modeling - Utility Bill evaluation

Results from a 500+ response survey of Home Energy Auditors (October 2011)



Palmer, K. Walls, M., Gordon, H. and Gerarden, T. (2011). *Assessing the Energy-Efficiency Information Gap: Results from a Survey of Home Energy Auditors.* Resources for the Future, http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.231.9988&rep=rep1&type=pdf, accessed 9 January 2018.

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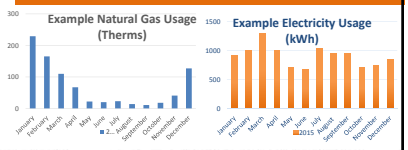
Energy Modeling / Energy Bills

Energy Analysis



Gagliano, J. & Thomas, G. (2015). ***NYSERDA Home Performance with Energy Star Realization Rate Attribution Study.*** Performance Systems Development, http://psdconsulting.com/nyserda-hpwes-rr-study/, accessed 9 January 2018.

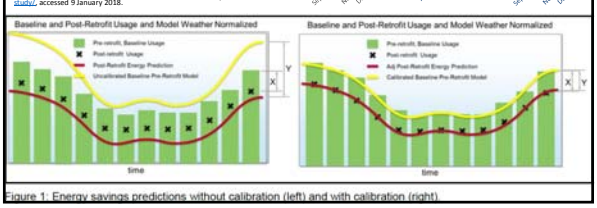


Figure 1: Energy savings predictions without calibration (left) and with calibration (right)

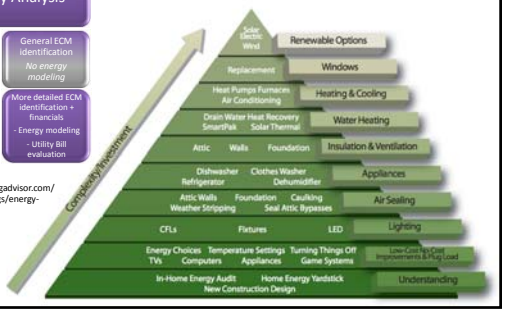
Step 3: Energy Analysis

Energy Analysis

Walkthrough — General ECM identification *No energy modeling*

Comprehensive — More detailed ECM identification + financials - Energy modeling - Utility Bill evaluation

www.greenbuildingadvisor.com/blogs/dept/musings/energy-efficiency-pyramid



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Step 4: Energy Audit Report

	Walkthrough Energy Audit	Comprehensive Energy Audit
Other Names	Simple Energy Audit Checklist Energy Audit Home Energy Survey	General Energy Audit Standard Energy Audit Detailed Energy Audit
Typical Cost	$0 - $100	$300 - $800
Report Detail	Ranked list of general energy measures	Ranked list of more detailed energy measures with cost/payback
HERS Score / Home Energy Score?	Sometimes	Sometimes
Goals	1 - **Find opportunities for energy conservation, efficiency, and/or renewable energy** (*general*) 2 - **Identify any health/safety/ moisture concerns** (*general*)	1 - **Find opportunities for energy conservation, efficiency, and/or renewable energy** (*detailed*) 2 - **Identify any health/safety/ moisture concerns** (*detailed*) 3 - **Examine details for energy modeling and cost implications for ECM implementation**

ECM Rankings

Written Energy Audit Report

Walkthrough — Ranked list of general ECMs

Comprehensive — Ranked list of detailed ECMs with expected paybacks

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ECM #1 — Conservation — Unplug videogame systems when not in use

ECM #2 — Conservation, Efficiency $ — Install/use programmable thermostat

ECM #3 — Efficiency $$ — Replace old refrigerator

ECM #4 — Efficiency $$$ — Air seal & insulate attic

ECM #5 — Efficiency $$$$ — Install high-efficiency furnace

Step 4: Energy Audit Report

Written Energy Audit Report

Walkthrough — Ranked list of general ECMs

Comprehensive — Ranked list of detailed ECMs with expected paybacks

ECM #4

Air seal & insulate attic

Description

The attic insulation was approximately R-15 and had minimal airsealing. It is recommended to airseal and insulate the attic to R-49.

Initial Cost: $3,500
Expecting Savings: $757/year (516 therms, 2,101 kWh)
Simple Payback: 4.6 years

The initial cost and associated savings reflect the need for properly airsealing and insulating the recessed can lights, and the overall performance of the existing assembly based on the visual inspection of missing insulation in some areas.

Health/Safety/Moisture Concerns

None found

Open wires found; address prior to retrofit

Reassess combustion appliances after retrofit

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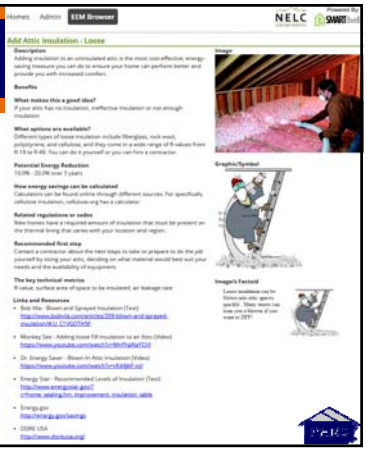
NELC Walkthrough Energy Audit Detail

Written Energy Audit Report

Walkthrough — Ranked list of general ECMs

Comprehensive — Ranked list of detailed ECMs with expected paybacks



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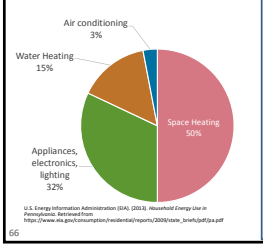
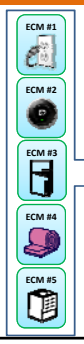
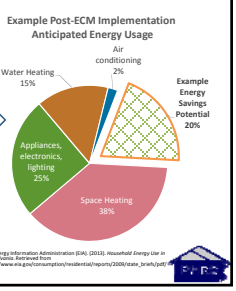
Step 4: Energy Audit Report

Written Energy Audit Report







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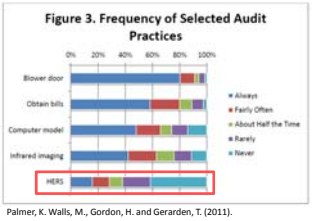
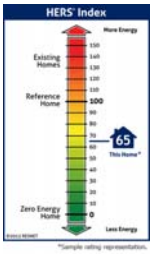
Energy Benchmarking

Written Energy Audit Report



Palmer, K. Walls, M., Gordon, H. and Gerarden, T. (2011). *Assessing the Energy-Efficiency Information Gap: Results from a Survey of Home Energy Auditors.* Resources for the Future, http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.231.9989&rep=rep1&type=pdf, accessed 9 January 2018.

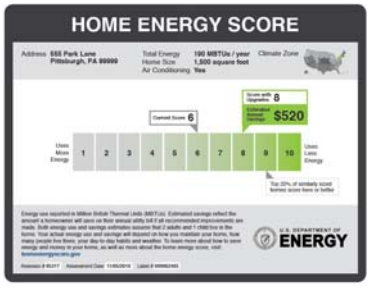


http://www.resnet.us/energy-rating

67

Energy Benchmarking

Written Energy Audit Report



http://www.everbluetraining.com/blog/home-energy-score-vs-hers-score

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Energy Benchmarking

Written Energy Audit Report

1) Hold one of these credentials
2) Identify local Home Energy Score partners
3) Complete a free online test / simulation
4) Score a home with a mentor
5) Score your own homes

Organisation	Minimum Accepted Credential	Website
American Society of Home Inspectors	ASHI Inspector; Certified Inspector	ASHI
Building Performance Institute	Building Science Principles Certificate of Knowledge	BPI
Build It Green	Certified Green Building Professional (CGBP); Green Point Rater	BuildItGreen
CalCERTS	Rater	CalCERTS
California Real Estate Inspection Association	Certified Home Inspector	CREIA
GreenHome Institute	GreenHome Professional	GHI
International Association of Certified Home Inspectors	Home Energy Inspector	InterNACHI
National Association of the Remodeling Industry	Green Certified Professional; Certified Remodeler; Master Certified Remodeler	NARI
National Institute of Building Inspectors	Certified Home Inspector	NIBI
North American Board of Certified Energy Practitioners	PV Installation Professional	NABCEP
North American Technician Excellence	Air Conditioning / Heat Pumps; Gas / Oil Heating; Gas / Oil Hydronics	NATE
Oregon Training Institute	Residential Energy Analyst	OECA
Residential Energy Services Network	HERS Rater	RESNET
Passive House Institute US	Certified Passive House Consultant	PHIUS
U.S. Green Building Council	LEED Green Rater or Green Associate	USGBC
Other Organization?	Contact us here or via email at HomeEnergyScore@ee.doe.gov	

https://betterbuildingssolutioncenter.energy.gov/home-energy-score/become-assessor

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Summary

- **Energy audits are one aspect of the big picture of residential energy management**
- **Two primary energy audit products with lots of variation in between**
  - Walkthrough
  - Comprehensive
- **Seek residential energy professionals who can provide you or your customers the right level of service based upon their specific home's needs**
  - Detail
  - Building Science application

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Evaluations / Certificate / Questions?

This concludes The American Institute of Architects Continuing Education Systems Course

Link to Certificate:

www.cvent.com/d/05qhkr/4W

Join us next month on Tuesday, February 12 at 1pm for the webinar titled
"A Look Into Visitability – Why & How?"
Presenter: Chris Hine (PHRC)

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