

DIY Home Energy Audit

How to do a home energy inspection

About Me

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Photos Courtesy of Christina Bollinger

Goals

1. Get to know your home from an energy usage perspective
2. Save money
3. Be more comfortable
4. Reduce your carbon footprint
5. Increase indoor air quality
6. Plan for long term home investment and maintenance

Prepare

Time: 2 hours

Tools needed:

- Camera
- Ladder (big enough to get you into the attic safely)
- Flash light
- Tape measure
- Screwdriver
- Matches

Information needed:

Your billing and usage history from Ameren UE, Laclede Gas, Missouri American Water

Seattle Check list

(http://www.seattle.gov/dpd/static/DIYweb_LatestReleased_DPDP016083.pdf)

Whole House Approach

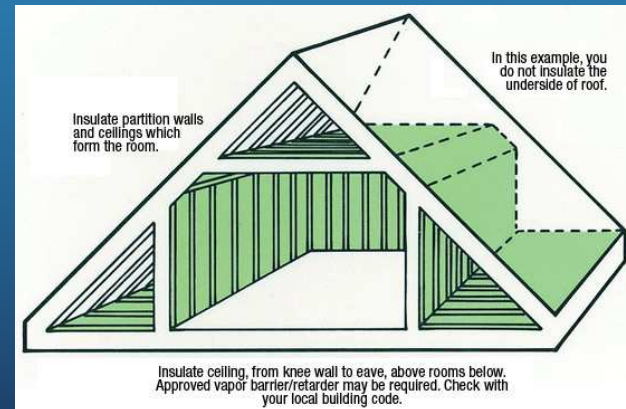
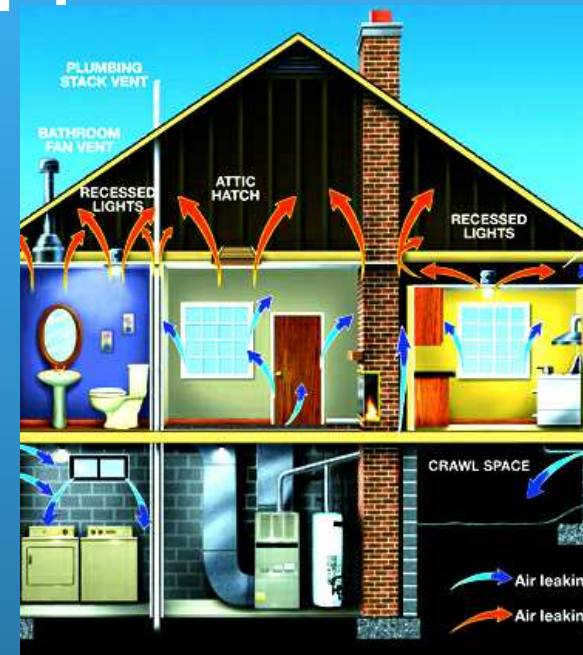
Your House is a system.

We are going to teach you how to inspect your home's systems, evaluate and plan for upgrades.

Answer questions like:

What is kind of Furnace is that?

Do I need more insulation?



Insulation - Define the thermal boundary
What kind is that? Do I need more?

Attic, Wall and Basement



Attic Bypasses



Measure your insulation in your attic. You should be at R-38 or above. Insulation is cheap. Call around and get bids. Make sure the bypasses are sealed before you insulate.

Reference BPI technical standards

Use cellulose -> nontoxic and high recycled material content

Typical Insulation R-values

Insulation Type	R-value per inch	Typical Applications
Cellulose, loose fill	3.7	Attic Floor
Cellulose, high density	3.2	Walls, Enclosed Cavities, Framing Transitions
Fiberglass, batts	3.0*	Basement Ceiling, Open Stud Walls, Attic Floor*
Fiberglass, loose fill	2.8	Attic Floor, Walls (existing)

Air Infiltration

Where are you losing the air that you pay to heat and cool and how to properly air seal?

- Inspect every window and door for proper operation.
- Window and door trim should be caulked to the wall and jamb
- Does window and door weather stripping make good contact?
- Band board penetrations
- Attic hatch

HVAC Inspection - Types of furnace and boilers.



+450F



+350F



+110F

If your system is over 20 years old, replace it with a 90%. Make sure they install both pipes!

Boilers

Steam, Hot water and Condensing



Water heaters



+\$900



\$2000



\$1600

Gas Appliance Venting

- Carbon Monoxide is dangerous
- Turn you exhaust fans, air handler and clothes dryer on. Fire up your natural gas furnace and water heater.
- Check and see if they are spilling exhaust into your home
- Orphaned water heaters
- Install CO/Smoke detectors

Thermostats - Why do programmable t-stats save money
Hold/Run confusion?



Dirty A Coils kill furnaces. AC coil pan fills up with condensation and leaks on furnace's heat exchanger
Wiring.

Low Freon causes ice and really high electric bills.

Ceiling fans cool people not rooms. Turn them off
When you are not in the room.



Change your filter!

Duct Work

Areas of concern



- Duct work outside the thermal boundary
- Disconnected duct work
- Undersized return air
- No return air
- Poorly balanced systems

Base load electrical usage



\$100 a year
Savings.



LCC 75% less \$
Last 6 times
Longer.



Check out EnergyStar.gov for lots of great base load saving info and advice

Health and Safety

- Asbestos
- Vermiculite
- Cracked heat exchangers = carbon monoxide
- Venting problems = carbon monoxide
- Flame roll out
- Gas leaks

Indoor Air Quality

- Bath fans
- Kitchen Exhaust
- Dryer venting
- Crawlspace
- Exposed fiberglass batt
- Plumbing leaks
- Foundation leaks
- Sewer traps
- Dirty filter
- Electric static air cleaner
- Chemical storage
- Gasoline storage
- Garages
- Pets

Make a report

- Seattle DIY checklist
- Review notes
- Review photos
- Write a report

Make a plan

- Set a budget
- Make a priority list
- Check for government and utility rebates and programs
- Decide what you can do
- Hang out at Lowes and Home Depot
- Call professionals
- Get 3 bids for everything

Do it

Resources

- Seattle DIY Energy Audit
- <http://inspectapedia.com/>
- [Energystar.gov](http://energystar.gov)
- BPI technical standards
- The Earthways Center
- STL Saves
- tdolan@urbanleague-stl.org