PPL Electric Utilities

The presentation will begin shortly!

CHOOSING THE RIGHT INSULATION

Hap Haven
PPL Pilot Manager

Nolan Alberti
Marketing Manager

CHOOSING THE RIGHT INSULATION

Thank you for joining us today. Remember, this is an overview!

- **60 second summary** – air sealing vs insulation

- **How Insulation Works** and examples of bad installations
- **Is There a Best Insulation** – what should I choose?

- What is the PPL Residential Energy Retrofit program? Incentives?

- Q and A at the end – please type into the box
- No need to take notes – we'll send you the PDF

PPL Electric Utilities

60-SECOND SUMMARY

Insulation has a job to do, but it needs help!

- Insulation's job is to stop heat movement.
- Most insulation can't do that without air sealing.
- And it can't do that if it's full of holes or gaps.

There's insulation for every location.

Insulation is not a "one-size fits all" solution.

- Is the location: damp or dry, vertical or horizontal, air sealed or not?
- For that location, is the best insulation: loose-fill, batts or board
- Fiberglass, cellulose, rockwool, foam

Air sealing and insulation go hand in hand **Look for January's webinar on our website:**

PPL Electric Utilities | Energy Efficiency Webinars

PPL Electric Utilities

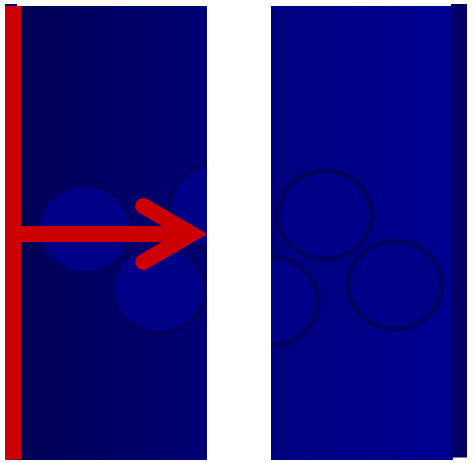
HOW DOES HEAT MOVE?

CONDUCTION is the transfer of heat (vibration) between molecules. Some products resist the movement of heat better than others (R value). (The air trapped in the solid does the insulating not the product.)

CONVECTION is the transfer of heat through molecules that are free to move. (Think fluids like air and water)

RADIATION is the transfer of heat using pure electromagnetic energy. (Think about the sun's energy traveling through the vacuum of space.)

CROSS SECTION OF MUG



WHAT DOES A THERMOS DO?

PPL Electric Utilities

MEASURING CONDUCTION

R-Value for Insulation: The measured **resistance** of a material to heat transfer or how well a material resists heat transfer.

ENERGY STAR® RECOMMENDED INSULATION LEVELS FOR THE PPL TERRITORY				
ATTIC	**ATTIC** IF YOU HAVE 3-4" ALREADY	**FLOORS** OVER COLD SPACES	**WALLS**	**BASEMENT WALLS**
R60 BLOWN-IN*	R49 BLOWN-IN*	R19-30 TIGHT TO FLOOR	R19-21 BLOWN-IN	R15 BOARD R19 BATT

You can mix and match insulation to get a better result. Examples:

- Foamboard outside a standard batt insulated wall.
- 1” Spray foam inside a wall combined with batts.
- Blown-in insulation in attic and foam board sandwiched with plywood for storage areas.

PPL Electric Utilities

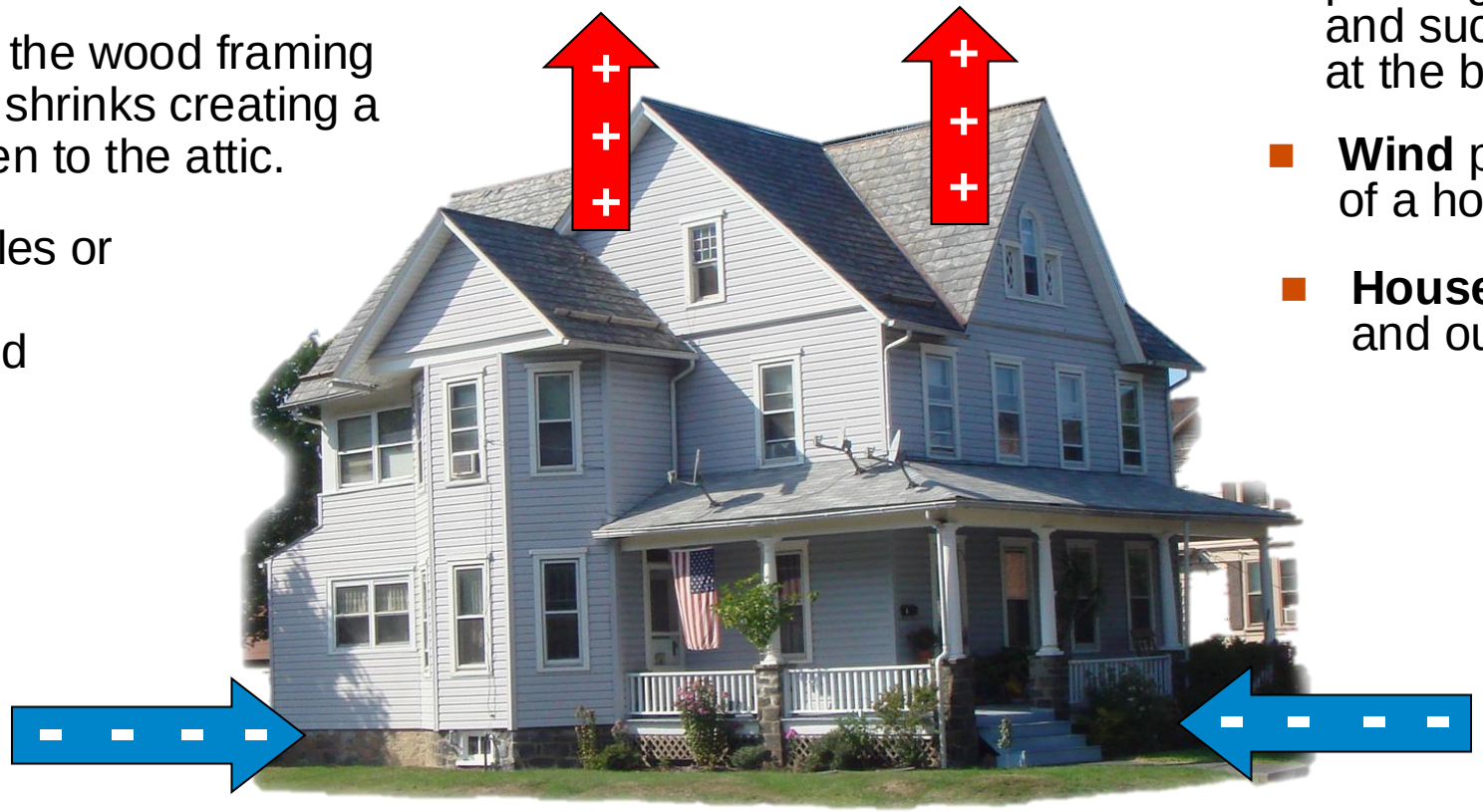
INSULATION IS PART OF THE SHELL SYSTEM

The shell includes all the framing, walls, ceiling, roof and floors. . .

The shell needs to be tight to keep heat in the house.

Failure 1 - Over time the wood framing in a house dries and shrinks creating a continuous crack open to the attic.

Failure 2 - Bigger holes or chaseways hide the plumbing, electric and heating systems.



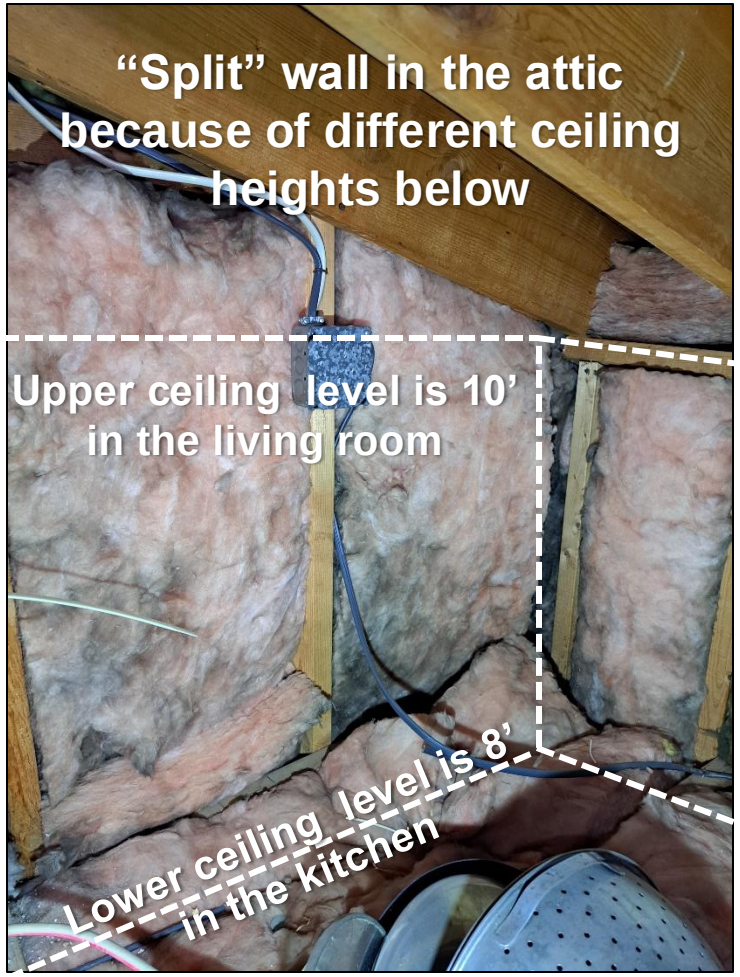
Air is always moving and carries heat and moisture with it.

- **Warm air rises** – pushing out of the attic and sucking cooler air in at the bottom
- **Wind** pushes air in and out of a house.
- **House fans** can pull air in and out of a house

PPL Electric Utilities

AIR SEALING and INSULATION TOGETHER

Block the air pathways and then air seal



Block the stud bay below.

Caulk or foam the blocking and any other holes.

R48 to R60 is recommended insulation value for attics. Existing insulation is 3.5" or an R11.

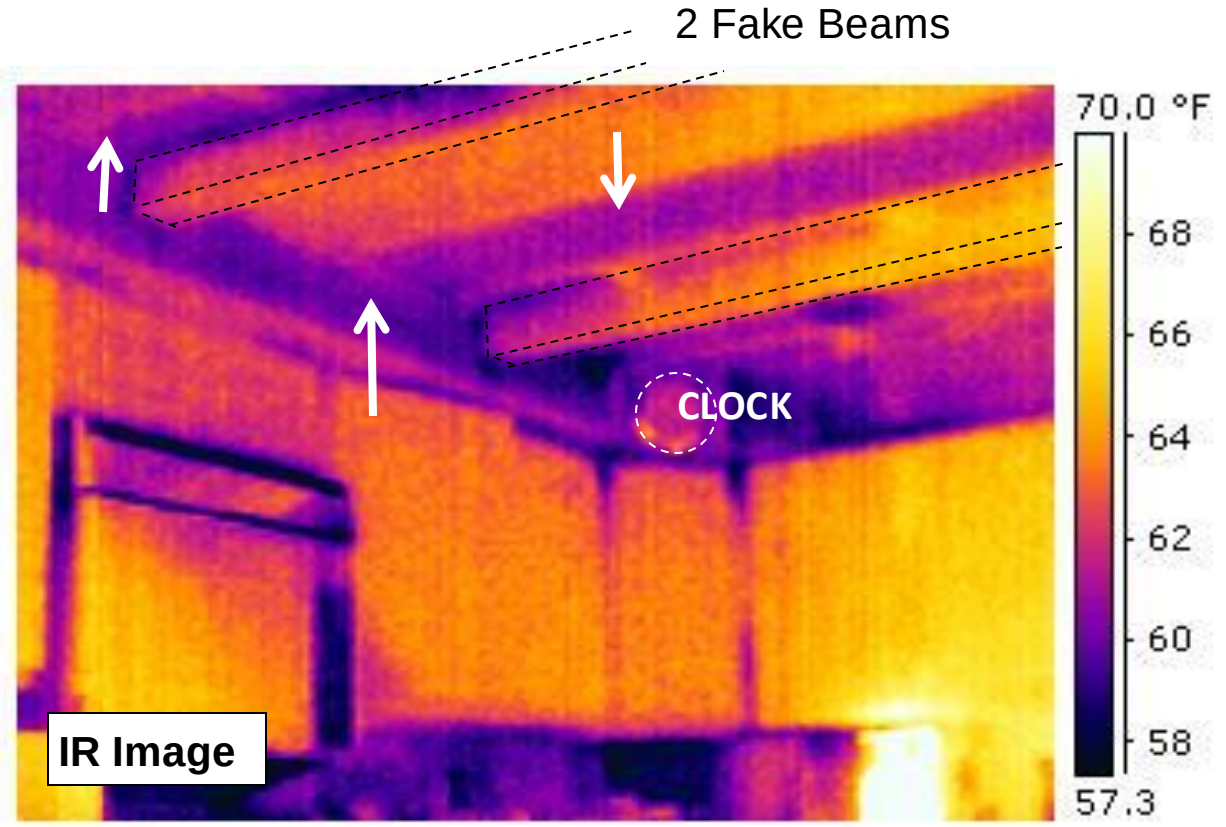
Fluff-up the existing fiberglass insulation and then cover with 1" foil-backed foamboard. Air seal the edges.

Cut the foamboard 10" taller than the wall so it can act as a dam for the insulation you'll blow into the upper attic.

PPL Electric Utilities

“I’M ALWAYS COLD IN THE KITCHEN”

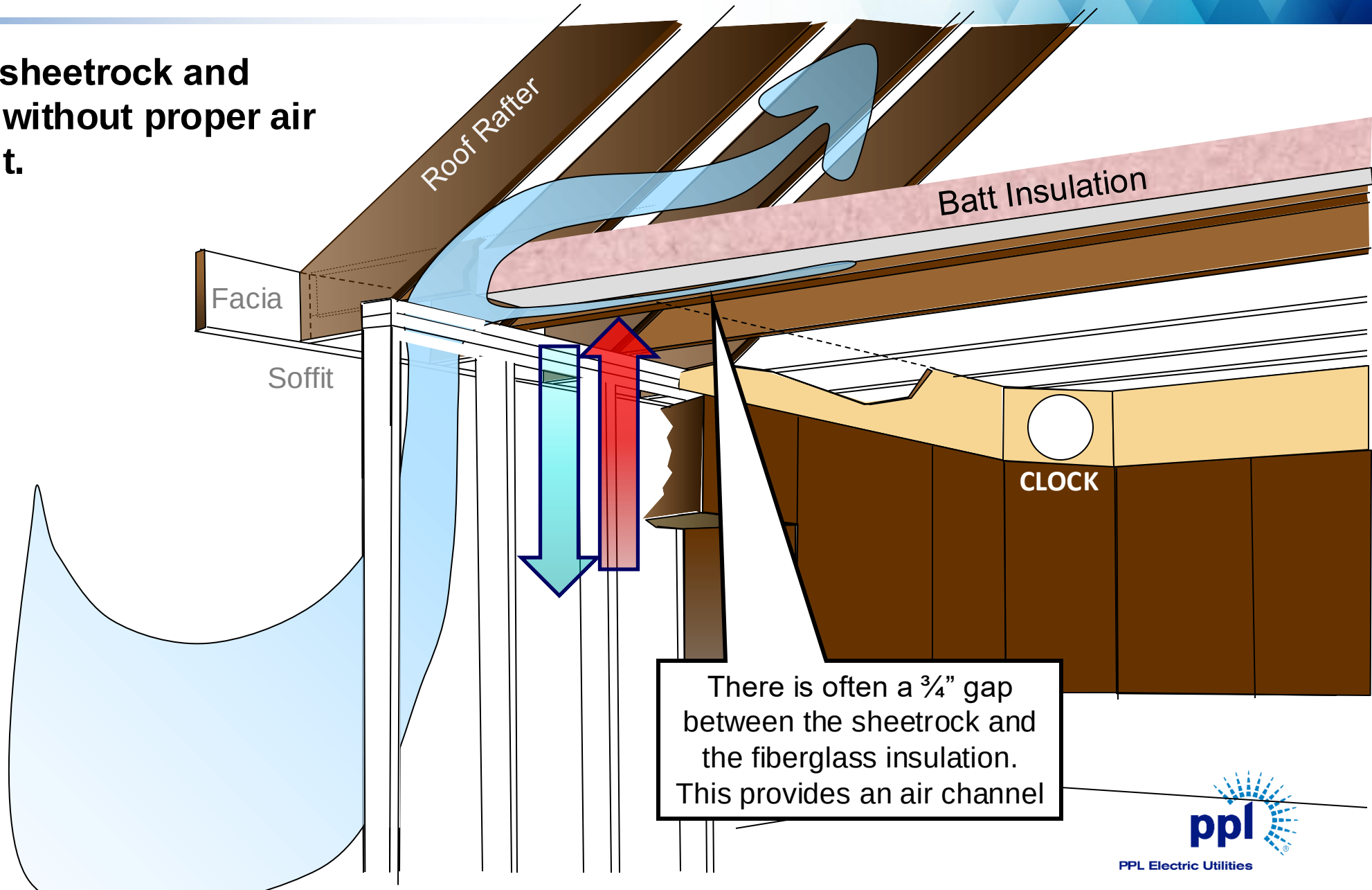
This is an “insulated” home, but this is what happens if air is allowed to move through or around the insulation.



PPL Electric Utilities

I'M ALWAYS COLD IN THE KITCHEN

Let's pull away the sheetrock and look at the framing without proper air sealing for the soffit.



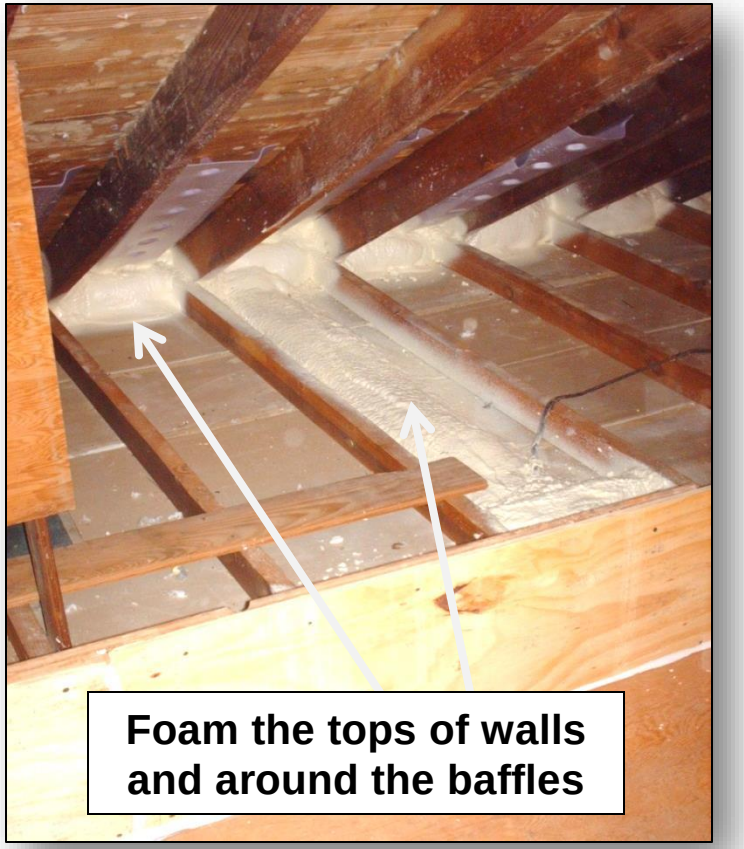
Wind blows air through the soffit, under the insulation and through the insulation

PPL Electric Utilities

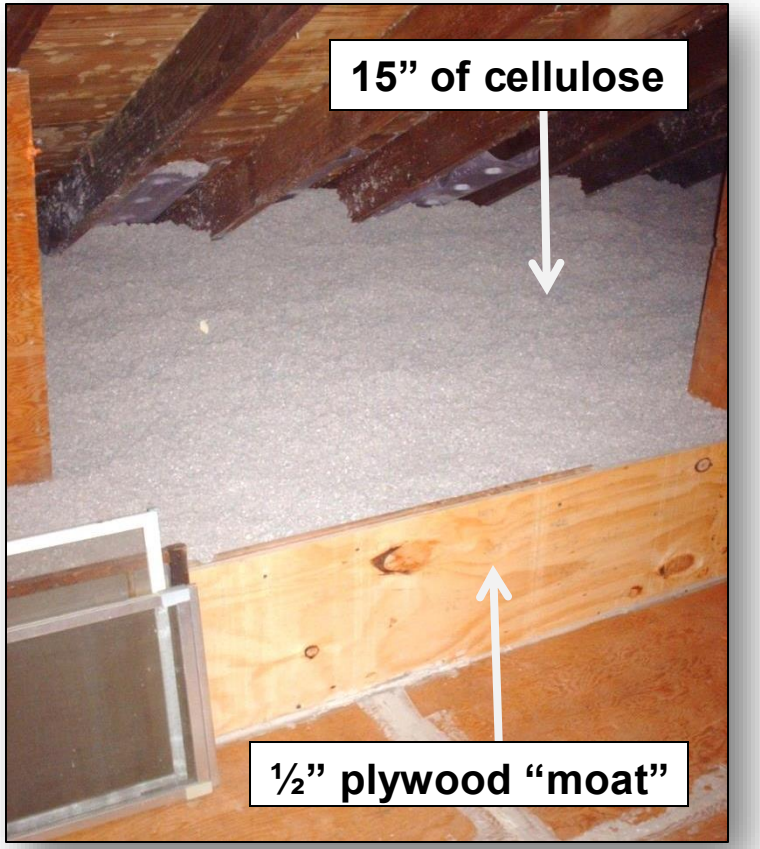
PROBLEM and SOLUTION IN THE ATTIC

Air goes through and under the insulation

On this job, the insulation was removed for air sealing.



Insulation after everything was air sealed and tested.



PPL Electric Utilities

INSULATION – LOOSE FILL

Cellulose

~R-3.7 per inch

Recycled newspaper

Mineral wool or Rock Wool

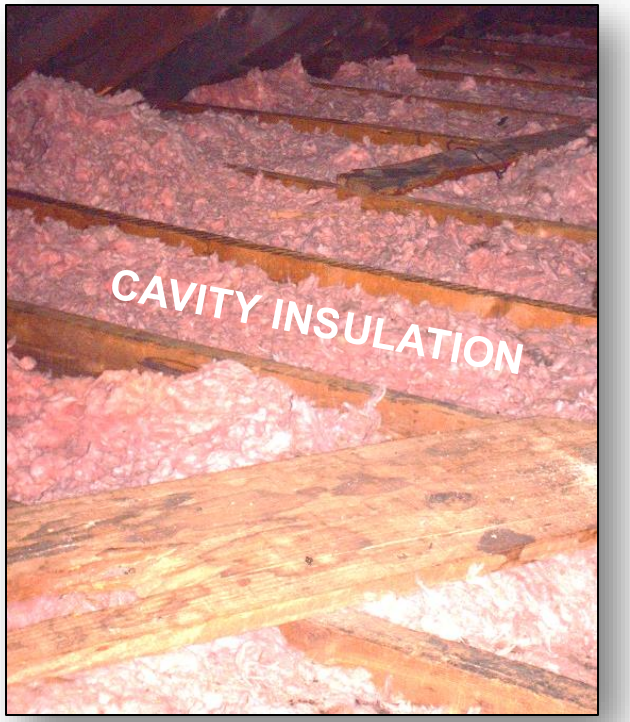
~R3.5-4 per inch

Fireproof

Fiberglass

~R3 per inch

Cleanest blow

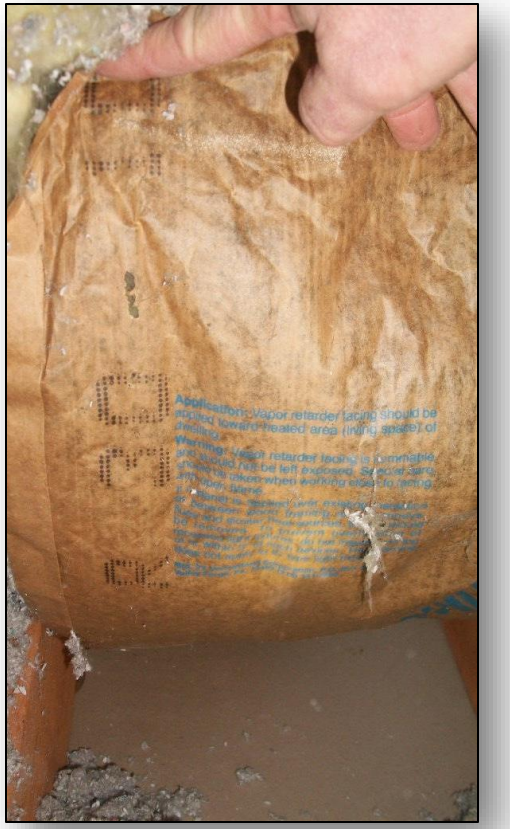


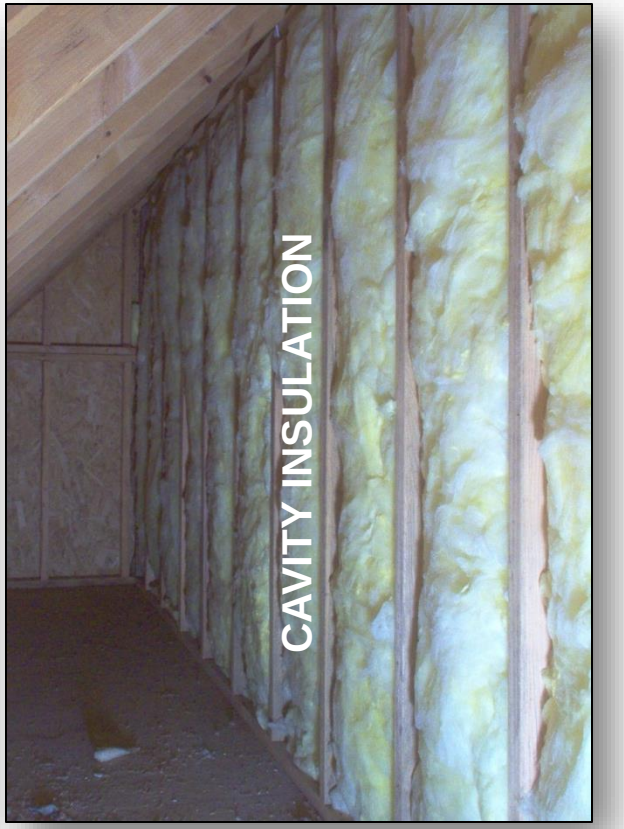
PPL Electric Utilities

INSULATION – BATTS

Fiberglass

~R3 – 3.5 per inch





Mineral or Rock Wool

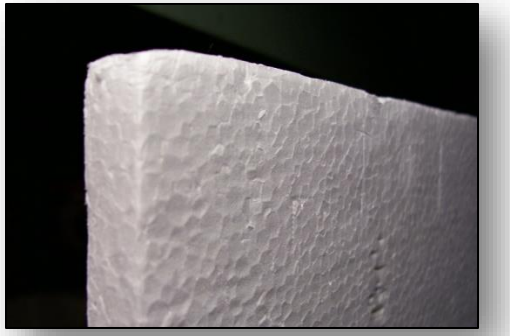
R-3.5 per inch + High temperature

PPL Electric Utilities

INSULATION – FOAM BOARD

Expanded polystyrene (EPS)

- R-4 per inch
- Little strength, compresses easily
- Least toxic of the foam boards



Extruded polystyrene (XPS)

- R-5 per inch
- Usually colored- pink, green, blue, etc.
- Good compression strength
- Can be used below grade

Polyisocyanurate (ISO)

- R-6.5 per inch
- Usually, foil or plastic faced
- Used above ground

PPL Electric Utilities

INSULATION – SPRAY FOAM

Spray Icynene foam

- Open cell - This is low density foam
- R3.7 per inch
- Usually requires the install of an air or vapor barrier
- Suitable for indoor application
- Can expand up to 100 times

Spray polyurethane foam (SPF)

- Closed cell- high density
- R6 per inch varies by product
- Usually requires the install of a fire barrier
- Suitable for indoor/outdoor application
- >2” thick is considered a vapor barrier

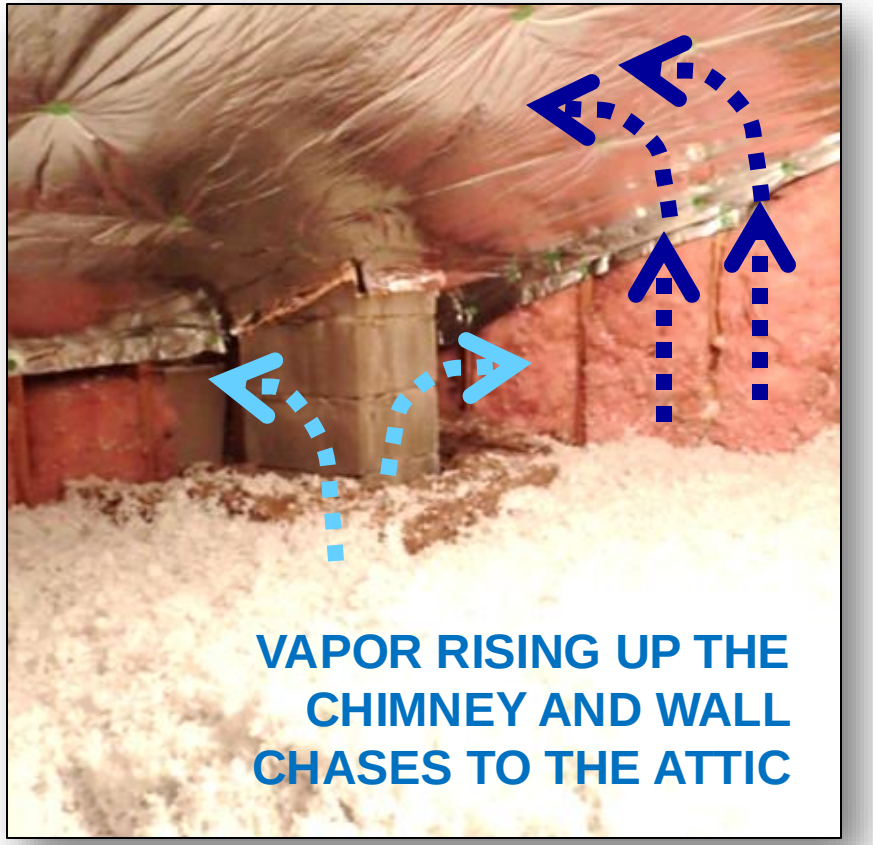
PPL Electric Utilities

INSULATION – RADIANT BARRIER

- Not considered insulation but can stop radiant heat
- Foil has high reflectivity and low emissivity (doesn't release heat)
- Must face an air space
- Can cause problems if not installed properly.

Radiant barrier comes as foil, backed by fiberglass or foam board.

Ducts should not be in attics, but if there is no alternative, wrap them with fiberglass covered in foil. (Duct insulation)



A rotted roof coming soon!

PPL Electric Utilities

INSULATION PROBLEMS

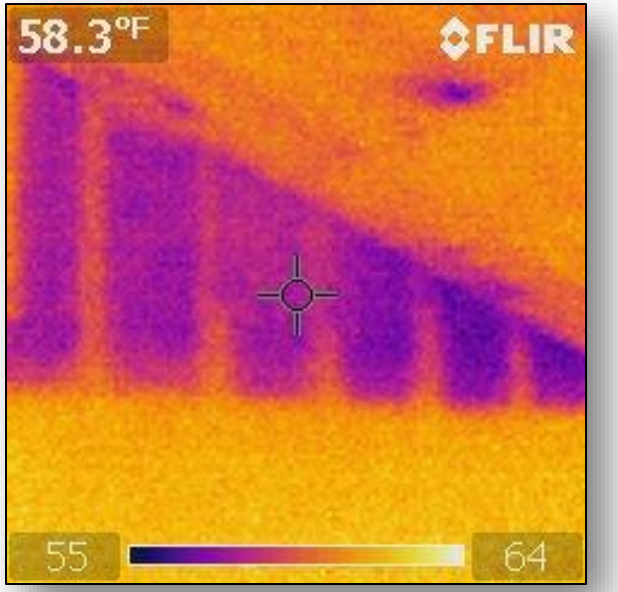
Insulation slows heat loss/gain by trapping still air in small pockets within the insulating material.

The trapped air within the material is the real insulator.

There are many reasons that insulation doesn't do its job properly.

Compressing insulation may reduce it's insulating value.

Gapped insulation (framing) reduces the R value.

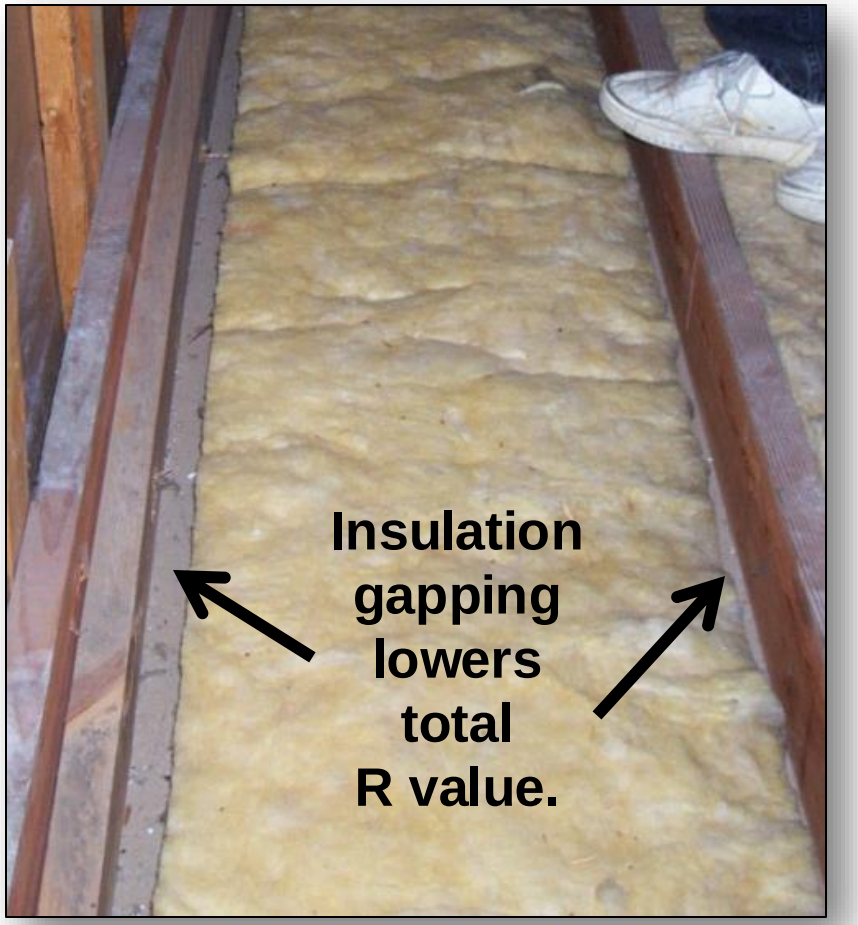


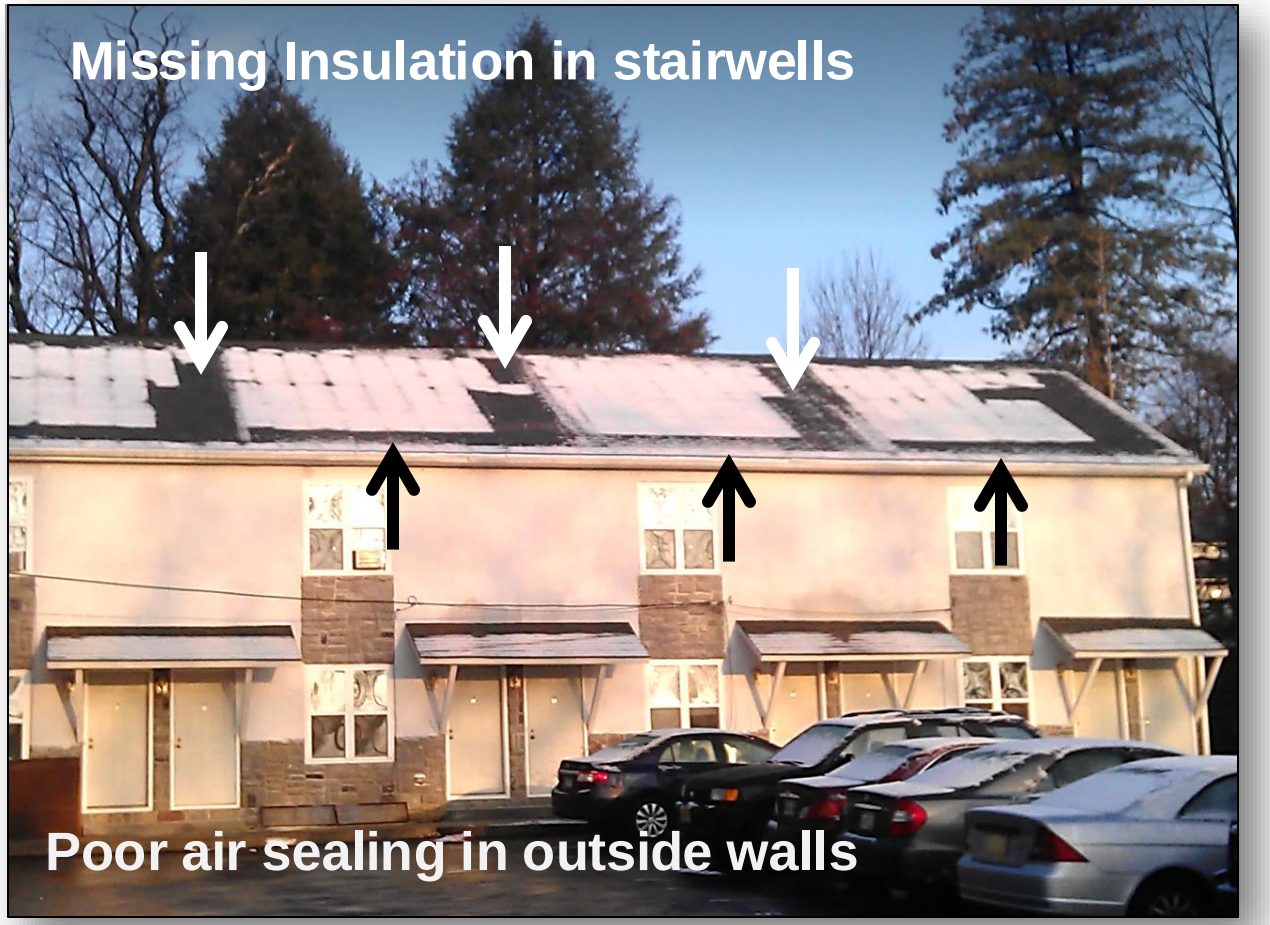
Insulation with air movement reduces the R value. (baffles)

PPL Electric Utilities

INSULATION PROBLEMS

R value should be down-graded to reflect actual conditions.





PPL Electric Utilities

INSULATION PROBLEMS - CAVITIES

"The room over the garage is always cold."

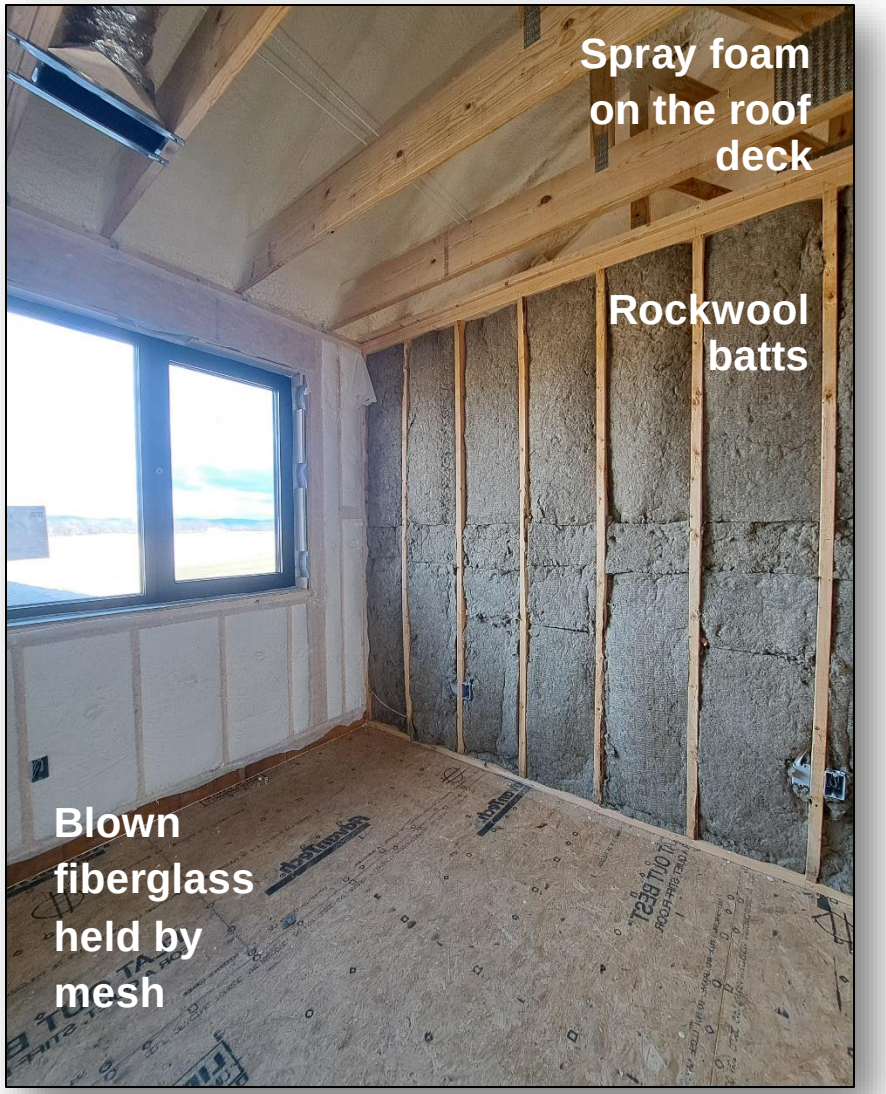
Solution: "Tight packing" insulation to both air seal and insulate – You must push the hose all the way to the end of the cavity, blow tight, pull back ~6", blow tight, pull back, etc.

Similar situations include:

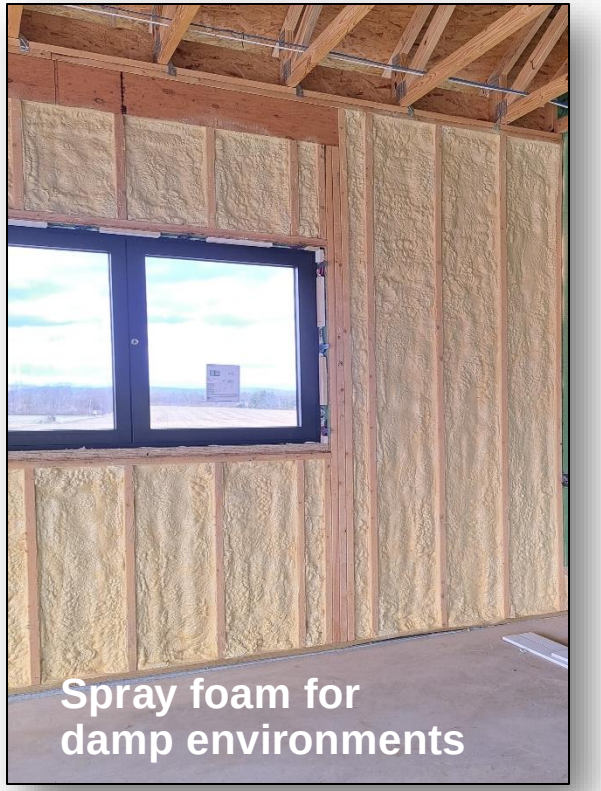
- Garage ceilings
- Floored attics
- Knee-wall transitions
- Uninsulated walls
- Overhangs

PPL Electric Utilities

REVIEW - THE RIGHT INSULATION



Grade 1 insulation installation means filling the cavity front to back, side to side and top to bottom. The cavity should be air sealed first if needed.



PPL Electric Utilities

WHY GET AN ENERGY AUDIT ?

It's an assessment of equipment and home systems -

How you use them, and which ones are underperforming.

It's an assessment that becomes the foundation for

a report listing the major issues found and what it takes to solve those problems.

It's a report you can use as an Action Plan

for scheduling work and maximizing the IRA tax credits.

PPL Electric Utilities

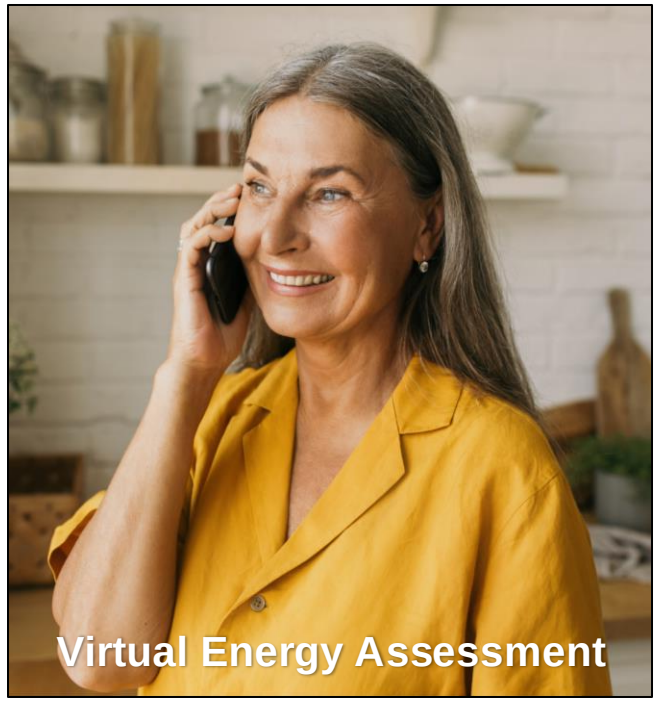
1ST STEP TO GETTING ANSWERS

VIRTUAL ENERGY ASSESSMENT

Your choice –
A voice or video call with an Energy Advisor

FREE for electric heating or central air customers and comes with a free energy savings kit mailed to your home.

Call 877-486-9204 to schedule



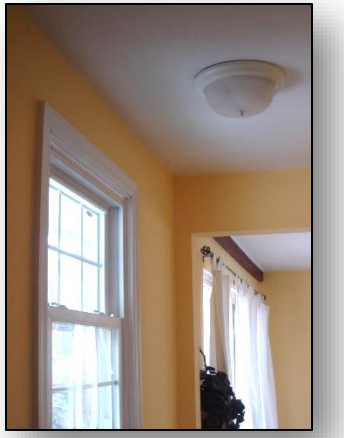
PPL Electric Utilities

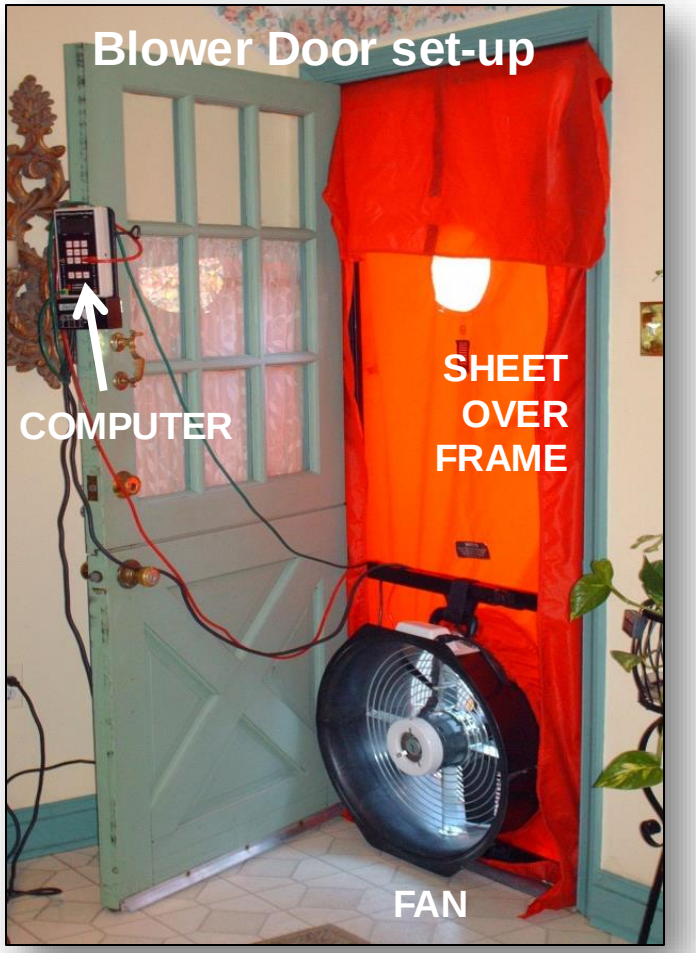
1ST STEP TO GETTING ANSWERS

IN-HOME ENERGY AUDIT

Most in-home audits are free if you assign the rebate to the contractor. Check with your independent auditor if the assessment is free before you schedule an appointment.

$350 rebate for electric heating and central AC customers
$200 rebate for electric heating or central AC customers





https://www.pplelectricsavings.com//ppl/homeequipment/contractor/

PPL Electric Utilities

ENERGY EFFICIENT HOME REBATES

https://www.pplelectric.com/rebates

Single Weatherization Upgrades	Rebate	Notes — SHELL SYSTEM
Attic Insulation (electric heat)	$500	75% of cost up to a max of $500
Attic Insulation (central A/C, non-electric heat)	$200	75% of cost up to a max of $200
Basement Wall Insulation (electric heat)	$500	75% of cost up to a max of $500
Basement Wall Insulation (central A/C, non-electric heat)	$200	75% of cost up to a max of $200
Air Sealing	$200	Air infiltration reduction (@ CFM50) x $0.25 up to a max of $200
Single Efficient Equipment Upgrades	**Rebate**	**Notes — MECHANICAL SYSTEM**
Smart Thermostat (self-install)	$50	ENERGY STAR® certified
Smart Thermostat (professional install)	$100	ENERGY STAR certified. Must be installed by a PPL Electric Utilities qualified contractor.
Heat Pump Water Heater	$400	Universal Energy Factor (UEF) ≥ 3.3
Air Source Heat Pump	$350	≥ 15.2 HSPF2, ≥ 11.7 EER2, ≥ 7.8 HSPF2
Air Source Heat Pump	$450	≥ 16.3 SEER2, ≥ 12.9 EER2, ≥ 8.2 HSPF2
Ductless Mini-Split Heat Pump	$400 (per outdoor unit)	≥ 15.2 SEER2, ≥ 11.7 EER2, ≥ 7.8 HSPF2
Central Air Conditioner	$200	≥ 15.2 SEER2, ≥ 12 EER2
Central Air Conditioner	$300	≥ 16.3 SEER2, ≥ 12.9 EER2

PPL Electric Utilities

PPL BONUS REBATES

Comprehensive Retrofit Bonus 1 ($250)

(**2 major treatments** installed within 12 months) (1 weatherization upgrade + 1 major mechanical upgrade)

Comprehensive Retrofit Bonus 2 (+$100 or $350 total)

(**3 major treatments** installed within 12 months) (Bonus Tier 1 + 1 or more additional major upgrades)

Deep Energy Retrofit Bonus ($500)

(**3 major treatments** installed at the same time)

(**In-Home audit** + 3 treatments with at least 1 shell and 1 mechanical treatments)

(Cannot be used with Bonus 1 or 2)

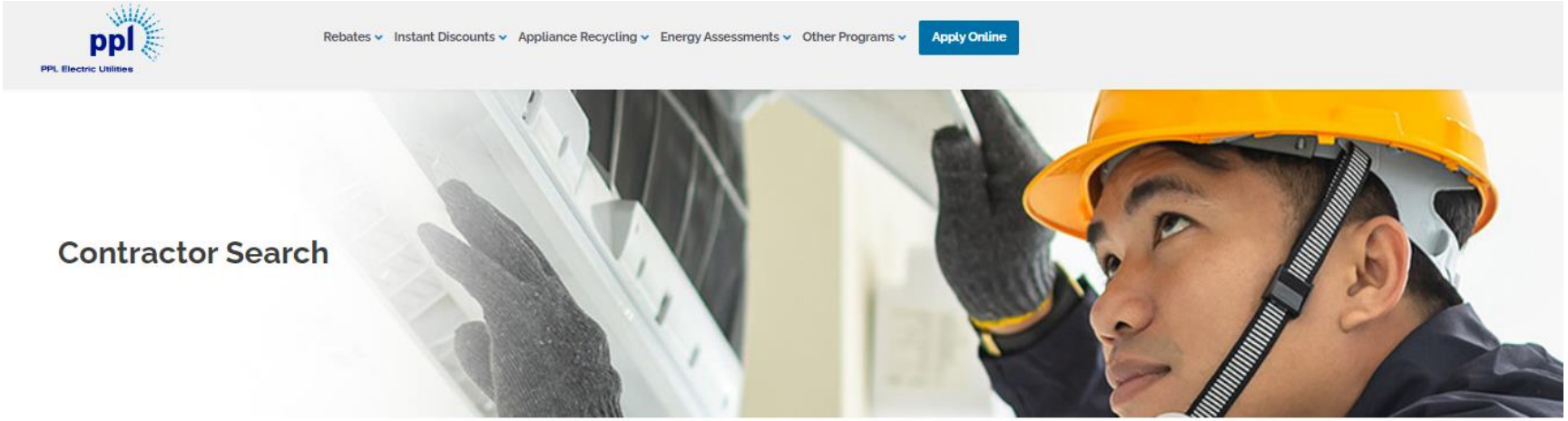
DER Bonus webpage: https://pplelectric.com/retrofit

PPL Electric Utilities

CONTRACTORS

Log onto the PPL Electric Utilities website for more program information or to identify a Trade Ally you'd like to hire.

https://www.pplelectricsavings.com//ppl/homeequipment/contractor/



The Trade Allies below are qualified to provide In-home Energy Audits with the Deep Energy Retrofit BONUS.

Advanced Efficiency Worx	support@aeworxpa.com
Energy Services Group	info@energysvc.com
King Conservation	casey@kingconservationgroup.com
MT Weatherization	ACastles@tennygroup.com

PPL Electric Utilities

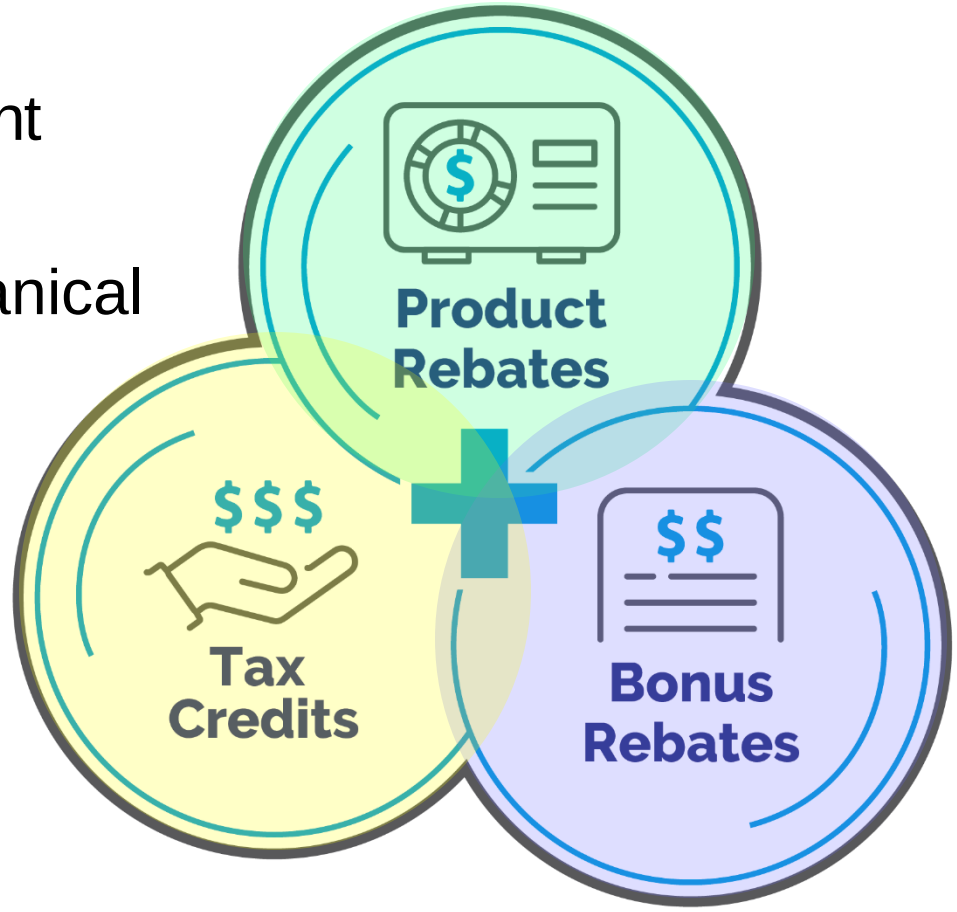
BUNDLE YOUR SAVINGS

Final Note: Don't forget to bundle your savings.

You may qualify for federal tax credits. It's a maximum of $3,200 per year from two different "buckets":

- Up to $2,000 for higher performance mechanical improvements and
- **Up to $1,200 home improvements.**
  (This includes air sealing and insulation)

https://www.EnergyStar.gov/about/federal-tax-credits



BUNDLE - air sealing and insulation:
(Up to $200 – PPL rebate for air sealing)
(75% up to $1,000 – PPL rebates for insulation)
(30% of cost up to $1,200 for federal tax credit)

PPL Electric Utilities

QUESTIONS and COMMENTS ?

Please type them into the questions box

PPL Electric Utilities

PPL Electric Utilities

Thank you for coming today

Hap Haven
PPL Pilot Manager
Hap.Haven@CLEAResult.com

Nolan Alberti
Marketing Manager
Nolan.Alberti@CLEAResult.com