

Energy Efficient Congregations

How Hoosier Congregations are Cutting Their Energy Use by 25% - and Yours Can Too



Welcome!



How do we cut our bills by 25% to 50%?

We cut out waste.

- Heat, cool & light people not empty spaces
- Plug holes and create thermal barriers
- Use technologies and practices that use less energy:
 - Cost-effective lighting
 - Manage big energy users: automatic controls
 - More efficient and better maintained HVAC equipment

I. Your Building

A. Thermostats & Zoning

B. Sealing and insulating

C. Maintaining & Replacing HVAC Systems

D. Managing & Monitoring Everything Else

The Building: A Thermostats & Zoning

**Heating and cooling
people... not empty
spaces.**

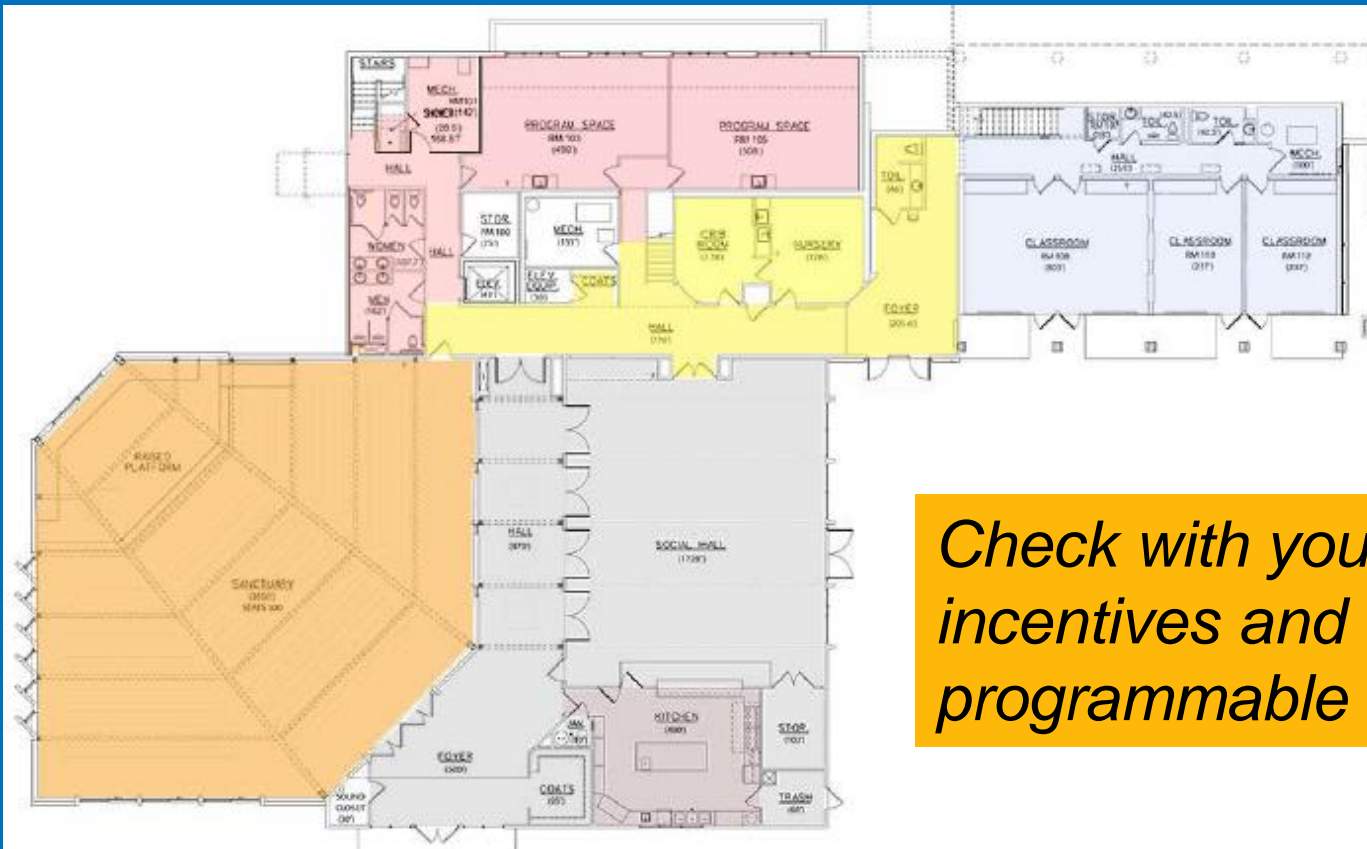
You can save as much as 10% a year on heating and cooling by simply turning thermostats back 7°-10°F for 8 hours a day from its normal setting.

The smaller the difference between the indoor and outdoor temperatures, the lower your overall cooling bill will be.



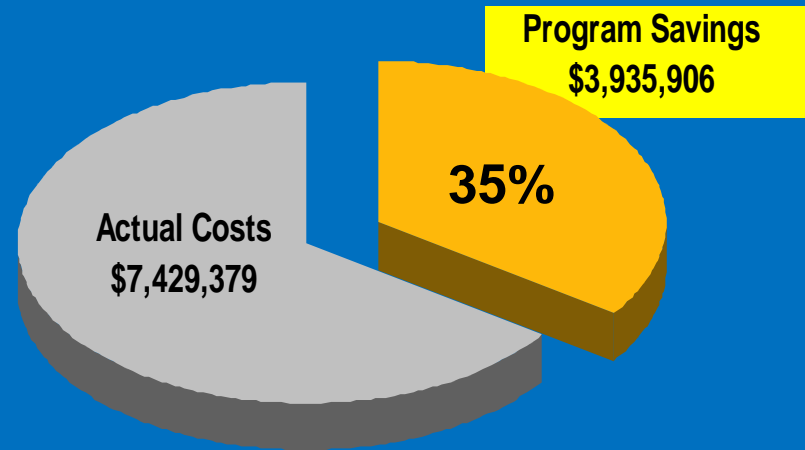
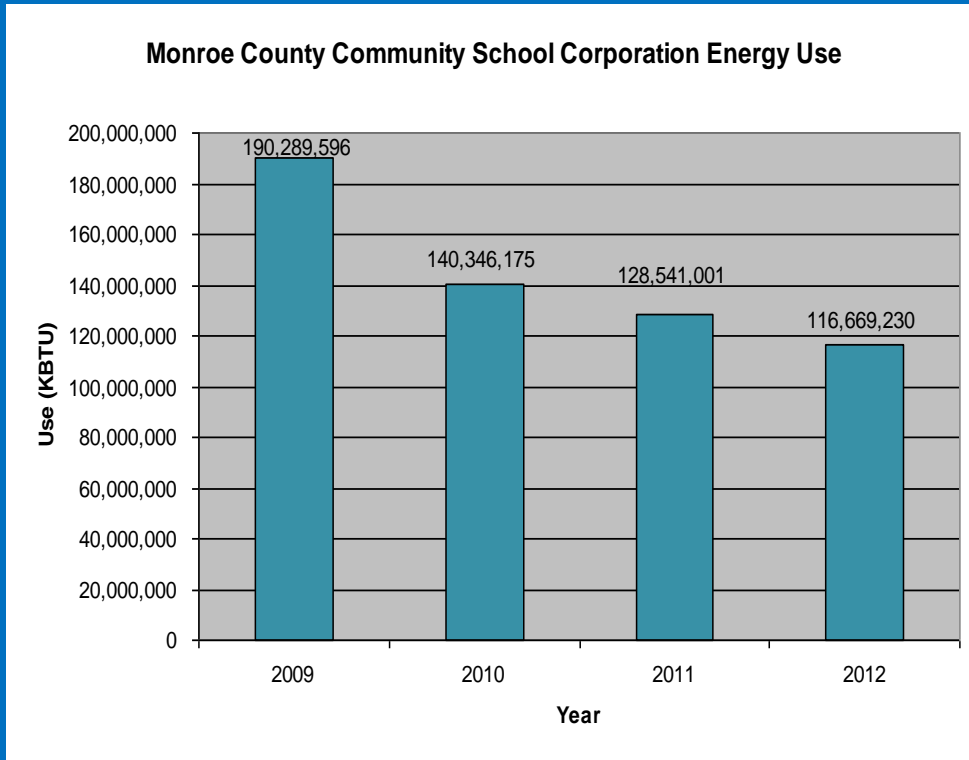
www.energy.gov/energysaver/thermostats

Many spaces may only be occupied a few hours a week, allowing the temperature to be set back for up to 30 hours a week, maximizing savings.



Check with your utility for incentives and rebates on programmable thermostats.

Thermostat setbacks: An excellent example



Monroe County Schools reduced their energy use –and cost– by 35% between 2009 and 2012 almost solely by setting back their thermostats!

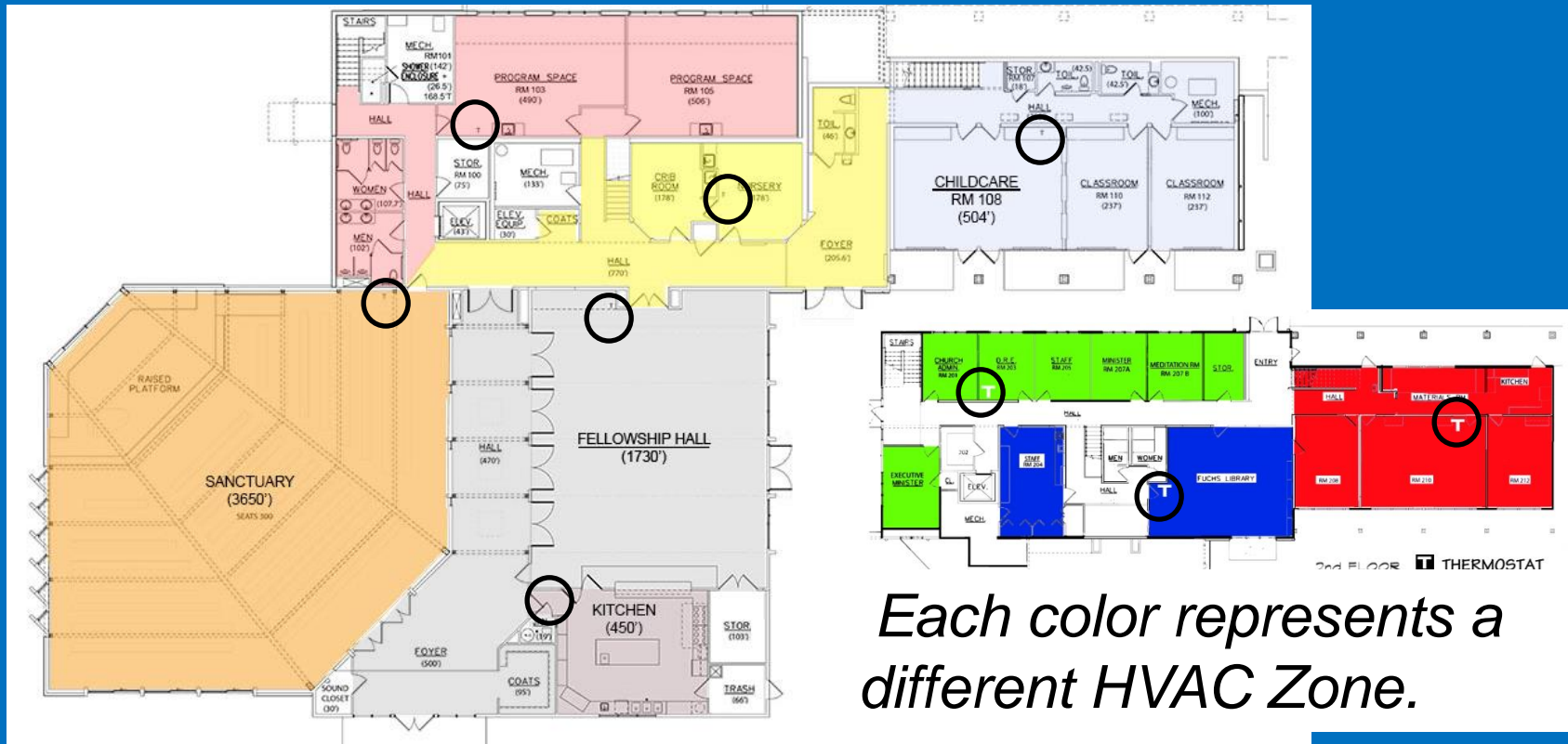
Five Simple Steps

- 1. Heating / Cooling Zones:** Map out each zone & thermostat
- 2. Barriers:** Is each zone separated by doors or walls?
- 3. Time:** When is each zone in use? For what?
- 4. Comfort:** Pick temperatures collaboratively for
 - when you have a program
 - when zone is occupied by staff
 - when no one is present
- 5. Setting:** In collaboration



Identify your Zones

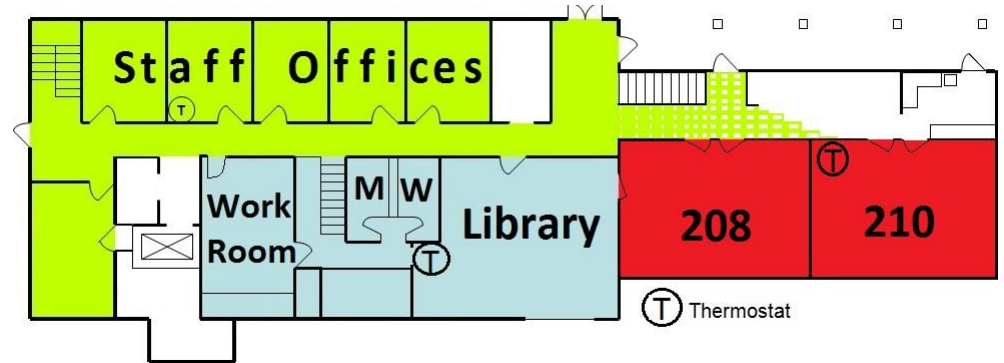
- ❑ *Locate your thermostats (black circles in plan);*
- ❑ *Note which spaces each thermostat heats & cools,*
- ❑ *Can any of these be closed off from others?*



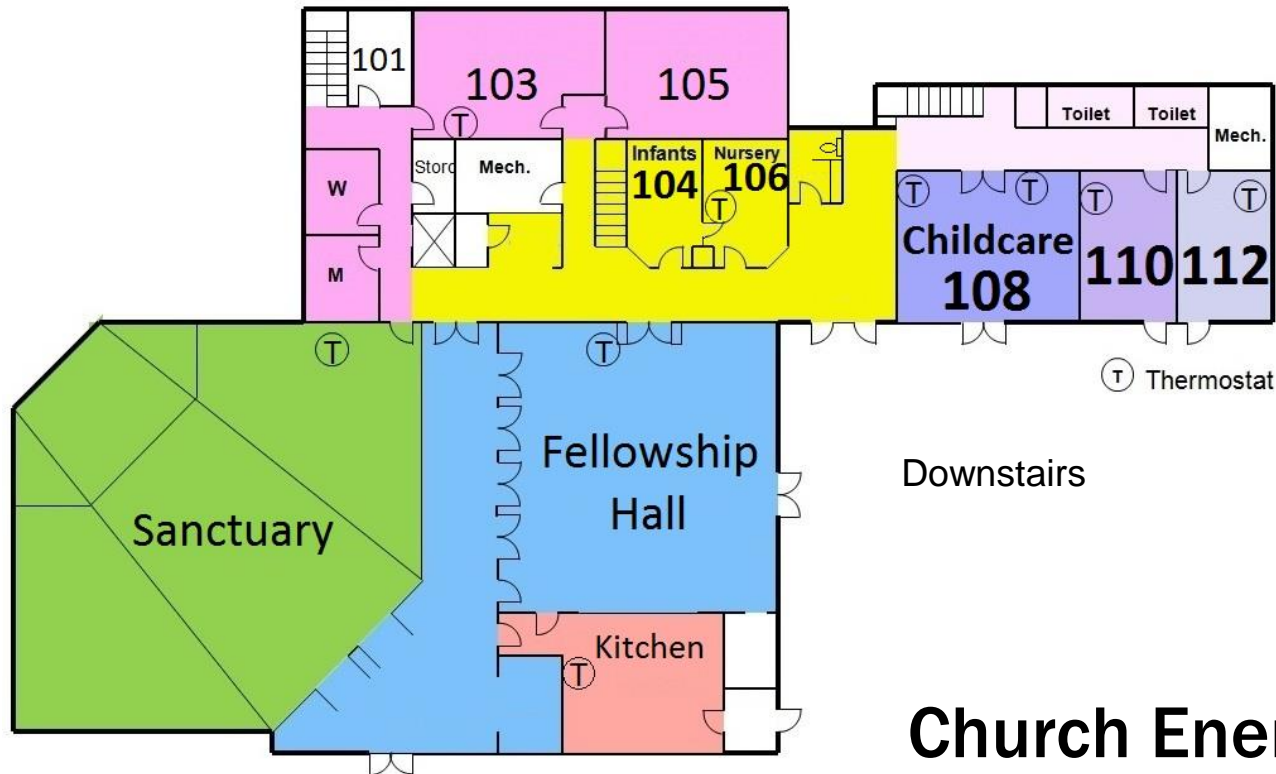
Each color represents a different HVAC Zone.

Get in a ZONE!!

You can help us meet our Paris Pledge and be an EPA building competition winner by knowing and using our **Energy Zones**.



Upstairs



Downstairs

Office staff will help you schedule meetings to best use our **Zones**. Then use the checklist by the light switch to return the room to conservation mode.

Church Energy Zones

Signage

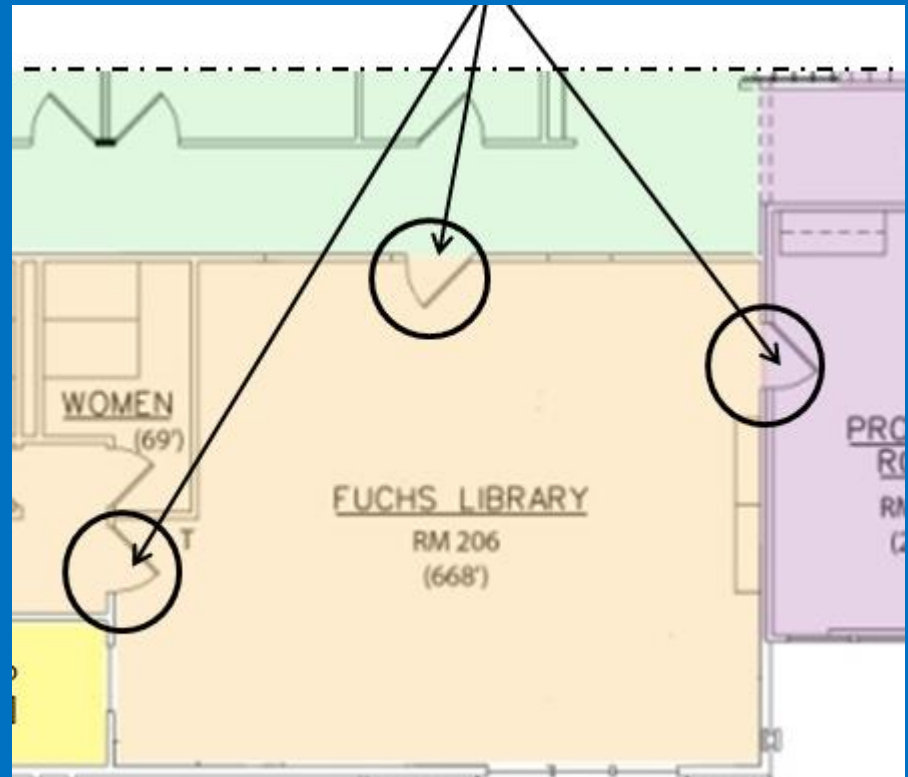
Plan of our library points out doors to other zones

Use the **thermostat's**
up & **down** arrows
 & 
to adjust for comfort.

Last one out?

- ✓ **Cancel your temporary hold** to return the **thermostat** to its default setting.
- ✓ **Close the doors** to avoid the hallway air setting it off.
- ✓ **And turn off the lights!**

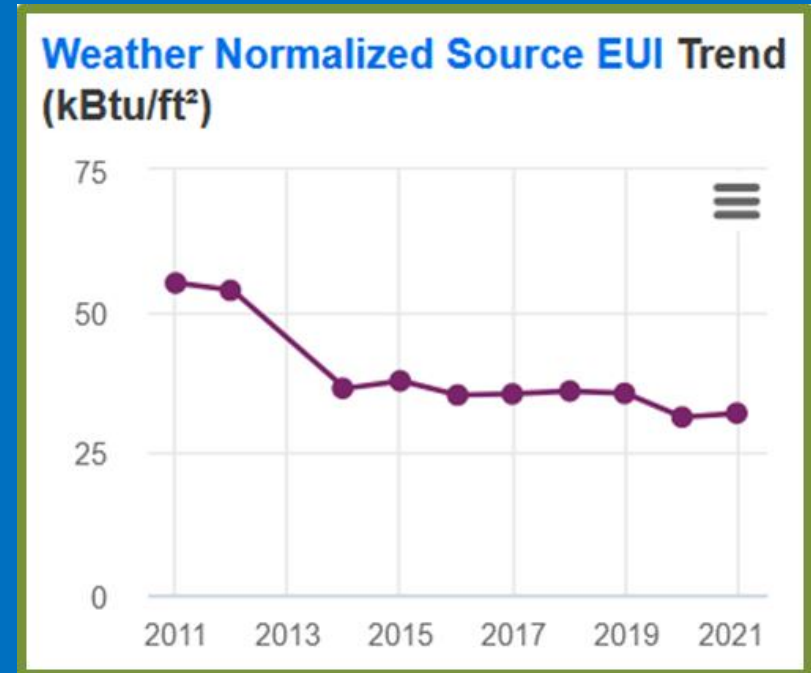
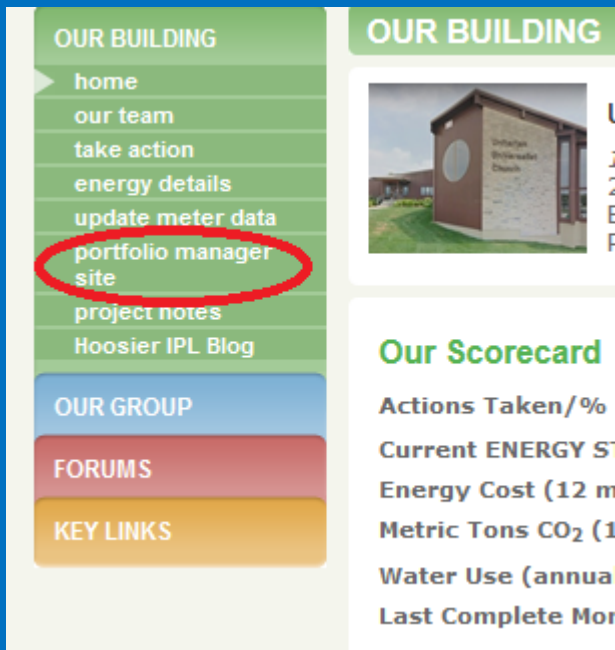
Thanks!



Typical thermostat sign

Tracking your progress

Energy Stewards includes a link to EPA's Energy Star Portfolio Manager, to which it uploads utility data



Portfolio Manager offers several graphs, including weather normalized data

Bottom Line

1. When space is not occupied, set winter temperature to 50°F and summer to 85°F.*
**but pay attention to isolated rooms with outside wall plumbing in the winter and possible mold problems in the summer*
2. When space is occupied, let the occupants decide the temperature setting (*within reason!*)

But what about the pipe organ?

According to the American Institute of Organbuilders, organs are safe in temperatures between 40 and 100 degrees if the relative humidity is between 30% in the winter and 80% in the summer

Have it tuned at performance temperature

Review actions in Section 2, Manage Thermostats, in Energy Stewards Action Table

OUR BUILDING

- home
- our team
- take action**
- energy details
- update meter data
- portfolio manager site
- project notes
- Hoosier IPL Blog

EDIT ACTION TABLE

This table allows you to record the actions you have taken. Use the "Jump to action topic..." drop down menu to filter the table.

Jump to action topic... ▾
3=Complete, -=Not Applicable

1. Get Started

Edit Checked Items

1=Reviewed/Discussing, 2=Budgeting For, 3=Complete, -=Not Applicable, 4=Approved

2. Manage Thermostats

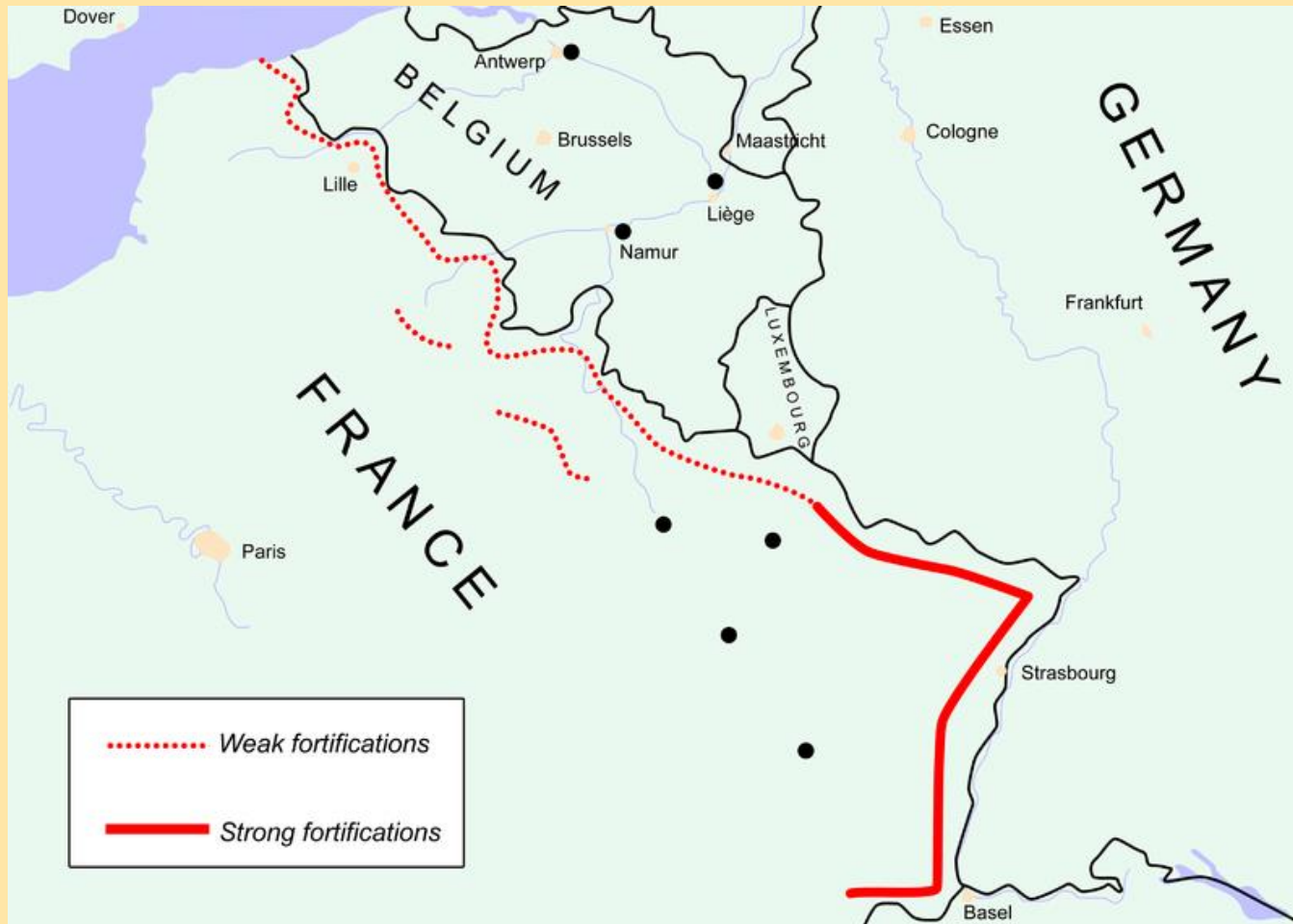
<input type="checkbox"/>	Higher Cost	2.10 Install programmable thermostats	3
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**Questions
or
Comments?**

The Building: B

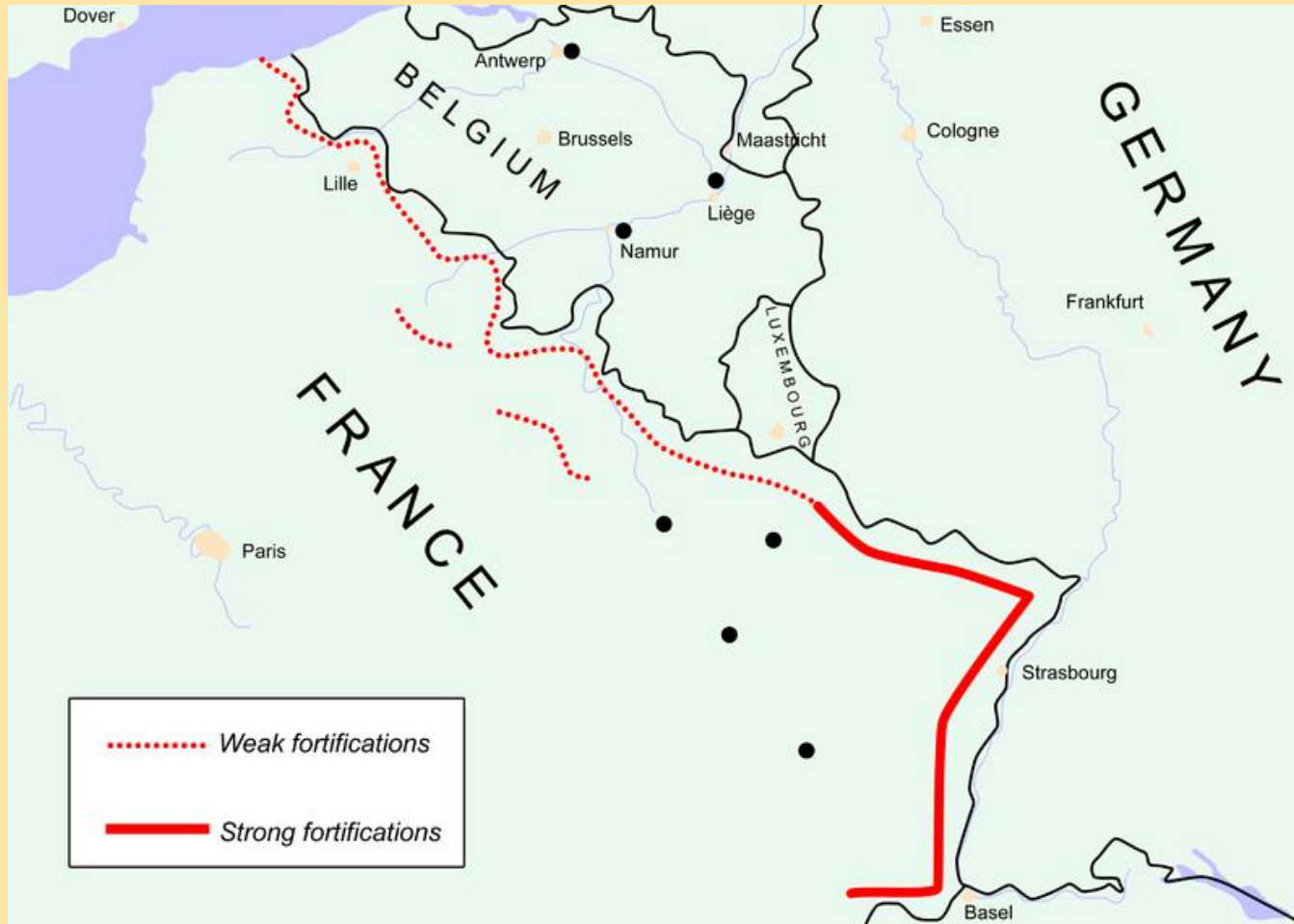
**Sealing
Air Leaks &
Insulating**

Why start here?



Heat will find a way

around...



air barriers!

or through gaps in...

**“Air tightness
is the
#1 priority
for energy
efficiency”**

CHASING SACRED AIR



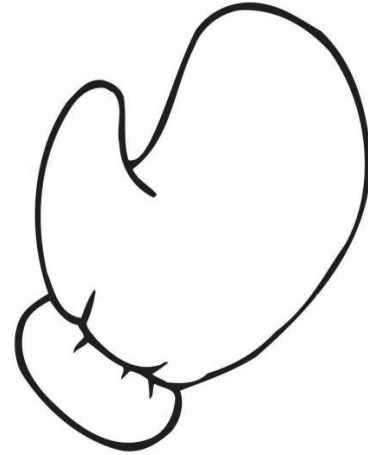
MONROE FRITZ

A COMMON SENSE GUIDE
TO ENERGY EFFICIENCY
IN SACRED BUILDINGS

Air Barriers vs. Thermal Barriers

What's the difference?

“Doesn't our insulation stop the air?!”



Thermal Barriers

—like loose & most batt insulation—

only reach their full potential when *next to* an
Air Barrier

Why is this true?

Heat moves from areas of **higher to lower** temperature;

and the

greater the difference

between indoor and outdoors

the more heat

—which you are paying to manage—
moves

So “Chasing Air” is chasing—



So why is air tightness often overlooked?

**When there is a problem we think of
the usual suspects:**

- **Insulation**
- **Leaky doors and windows**
- **HVAC efficiency**

And we call in those professionals

but when all you have is a hammer...

CASE STUDY: First United Methodist Church, Bloomington

THERMOGRAPHY

*Thermal camera image of a
1930s church sanctuary*



Why was the upper wall so much colder?



A look behind the wall at the rose window...

*...add Visqueen,
dry wall or other
air barrier next to
the insulation*

Air Barriers + Thermal Barriers

CASE STUDY: UU Church of Indianapolis



CASE STUDY: UU Church of Indianapolis



Uninsulated wall



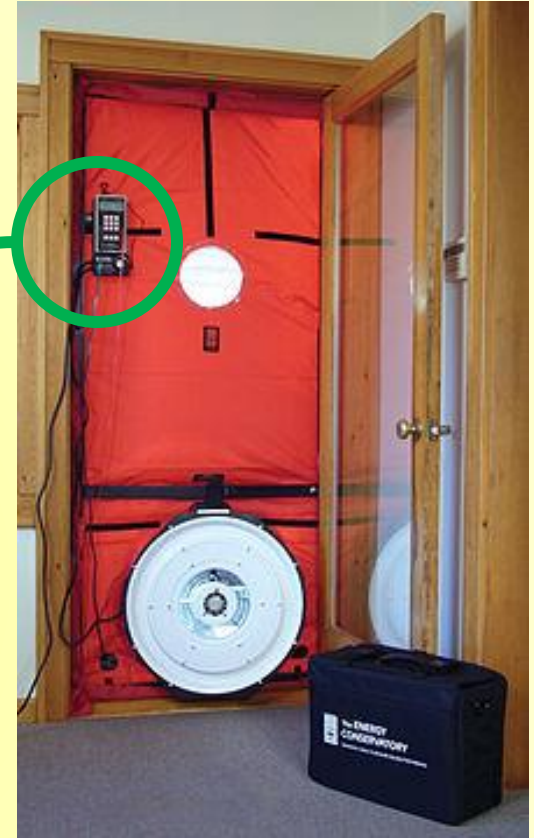
**And in the cottage, un-insulated ducts were outside the “envelope”
(portion not heated or cooled)**



A professional sealed and properly insulated above the dropped ceilings



Blower door reading after sealing



BLOWER DOOR TEST RESULTS

Initial reading: 11,900 cfm at 50 Pascals

Final reading: 3700 cfm at 50 Pascals

This equates to a 68% reduction in air infiltration or a ACH (air change per hour) of 7.7

Prediction: “Based on these numbers, you should see a 50% or better reduction in winter heating loads.”

Estimated savings for gas and electricity of \$700/year

How to assess your building's tightness?

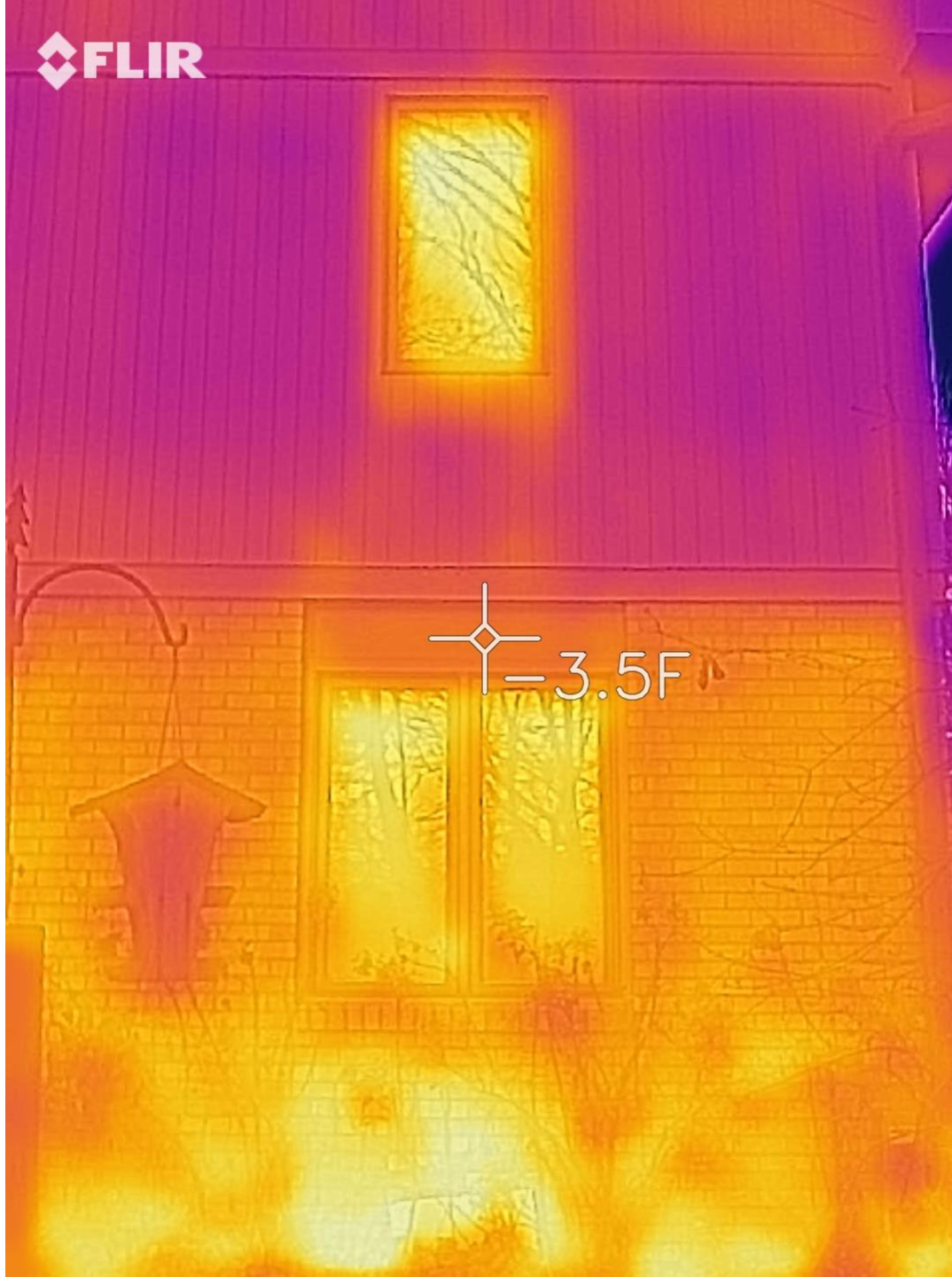
TURN TO:


**A Quick Guide to Sealing
Your Building's Envelope**

Page 27








-3.5F

 FLIR


31.7F

BUILDING'S ENVELOPE:

A. Finding leaks:

- ❑ Common places to look
- ❑ Problems are often hidden
- ❑ Professional audit may be needed

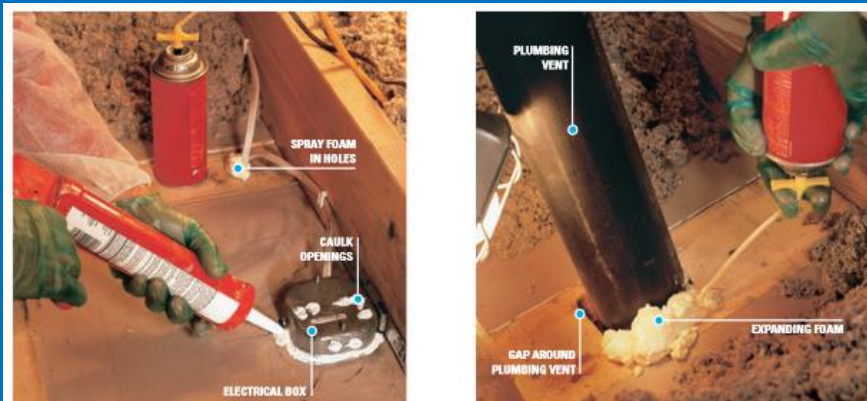


B. Sealing Leaks:

1. Prioritizing:

- **Make a plan:**
 - Low cost or by volunteers**
 - Biggest impact**

2. Volunteer projects



3. What about windows?



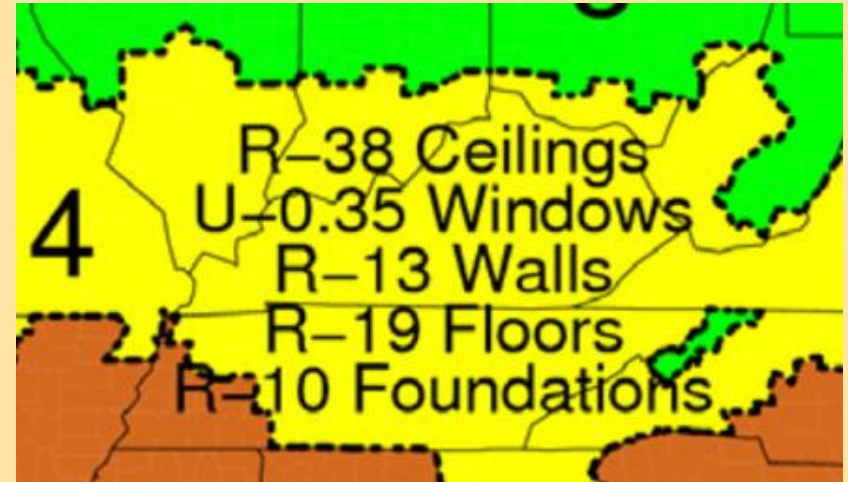
C. Finding funds:

- Solutions may quickly pay for themselves;**
- Volunteers can do much of the work;**
- Reinvest savings from thermostat setbacks;**
- Look for rebates!**

Insulation Quick Guide:

1. Prioritizing:

- Where to add insulation?
- How much is enough?
- What type to use?



2. Be careful of Wiring and Ventilation



3. How to up the insulating value of windows?





R-49

.753 In.

R-44

.670 In.

R-38

.589 In.

17

16

15

14

13

12

How to decide if you need more INSULATION?

See:

**A Quick Guide to
Sealing and Insulating
Your Building's Envelope in
Google Drive folder**

Windows

	<i>R Value</i>	<i>SHGC</i>
<i>One pane clear glass</i>	<i>1</i>	<i>.86</i>
<i>Two pane, argon gas with three layers of low E film</i>	<i>3.7</i>	<i>.21</i>

Review actions in Section 3, Seal the Building, in Energy Stewards Action Table

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3. Seal the Building - Search for Air Infiltration

<input type="checkbox"/>	Lower Cost	3.10 Seal cracks around windows	3
<input type="checkbox"/>	Lower Cost	3.11 Seal cracks around doors	3
<input type="checkbox"/>	Lower Cost	3.12 Seal infiltration around electrical outlets	3
<input type="checkbox"/>		3.13 Seal leaks around	

**Questions
or
Comments?**

Thank you!

FAITH IN PLACE

Empowering people of diverse faiths and spiritualities to be leaders in advancing environmental and racial justice, providing resources to educate, connect, and advocate for healthier communities.



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