

Green Building Workshop Series Eco-City Alexandria Initiative



**Alexandria Energy Saver Loan and
Energy Star Program**

9:00 AM – 12:30 PM

June 16, 2012

City Hall, Alexandria, VA

WELCOME

Erica Bannerman, Senior Environmental Specialist,
Transportation & Environmental Services, Office of
Environmental Quality, City of Alexandria

Eco-City Alexandria

Eco-City Charter Principles

- Land Use and Open Space
 - Water Resources
 - Air Quality
 - Transportation
 - Energy
 - Building Green
 - Solid Waste
 - Environmental Health
- Emerging Threats & Climate Change
 - Implementation

Environmental Action Plan

Energy Efficiency and Conservation Block Grant Projects

Energy Conservation (Green Building Phase II)

Energy Audits and Energy Efficiency
Retrofits for City Buildings

Green Fleet

Green Jobs Training

Green Loans

LED Traffic Signals/LED Street Lights

Renewable Energy Installation at City Facility

Speakers

- Michael Hogan, Residential Energy Services Manager, Local Energy Alliance Program
- Shane Cochrane, Program Implementation Division Chief, City of Alexandria Office of Housing
- David Woodruff, Vice President, Commonwealth One Federal Credit Union
- Lauren Fonvielle, SP, Marketing, Washington Gas
- Mike Dearing, Trade Relations, Washington Gas
- Roger Moffat, Energy Efficiency Programs, Washington Gas
- Erica Bannerman, Transportation and Environmental Services, OEQ
Annette Osso, LEED AP, President, VSBN

Local Energy Alliance Program (LEAP)





The mission of the Local Energy Alliance Program is to lead the effort to retrofit buildings with energy efficient technologies. Our overarching goals include cost savings, job creation, energy self-reliance, and local economic development.

What We Do

LEAP is the energy and water efficiency program implementer for local community, providing:

- Information on the advantages of energy efficiency
- Pre-qualified contractors and 3rd party QA on retrofit jobs
- Special financing products for improvements
- Rebates to help make the retrofit more affordable



Home Performance w/ ENERGY STAR

20%



Home Performance with ENERGY STAR® Summary of Energy Improvements Performed



Home Address:
John Q Public
100 Main Street
Charlottesville, VA 22901

Work Performed by:
A PLUS Insulation Company

Work Verified by:
The Best Energy Auditor

Work Completed on:
January 31 2011

Cynthia Adams

Executive Director

Home Performance Improvements:

- *Accessed all kneewall areas & foamed 6" open cell foam and installed passive grates
- *Main attic-foamed entire roof deck with 6" open cell foam
- *Insulated basement floor to an R30 with fiberglass batts
- *Installed humidistat in attic to monitor moisture
- *Insulated all hot piping runs off DHW tank
- *Insulated rim joist with open 3" open cell foam

Home Performance Results Achieved:
All attic areas were addressed and reconfigured spaces brought duct work into conditioned areas. Entire floor area was insulated. Stratification issues improved.

Environmental Impact of Improvements:
Fuel usage and emissions reduced by treating entire attic and floor areas.

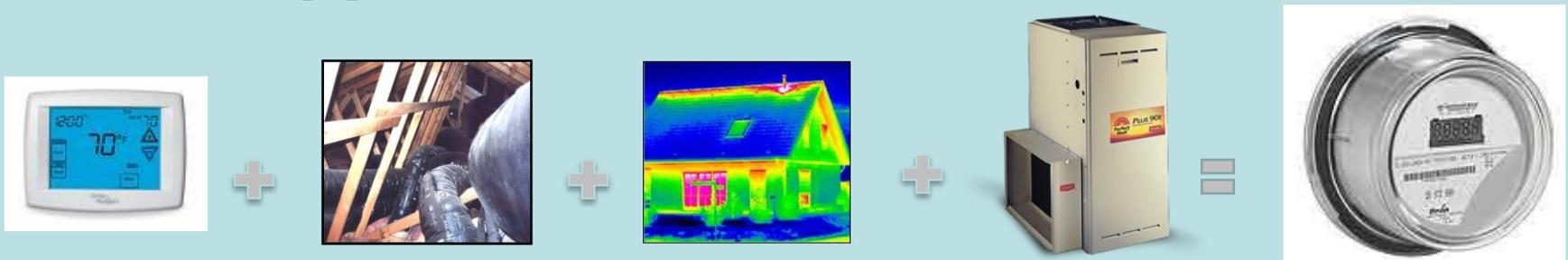


HOME PERFORMANCE WITH ENERGY STAR

Home Performance with ENERGY STAR® offers a comprehensive, whole-house approach to home improvement that results in better energy efficiency, greater comfort, and lower energy bills.

ENERGY STAR is a voluntary partnership sponsored by the U.S. EPA and U.S. DOE to protect the environment through superior energy efficiency.

HPwES Approach



Behavior

- Set Your Stat
- Improvement: 5% - 10%

Delivery

- Fix Leaky Ducts
- Improvement: 30% - 50%

Building Load

- **Stop Energy Leaks**
-
- **Improvement: 20% - 40%**

Equipment

- Efficiency / Size
- Improvement: 10% - 15%

Performance

- Efficiency
- Health
- Comfort

Whole House vs. Products Savings

Whole House Solution: 30% - 50%

(Ducts, Insulation, Behavior, 40K BTU 90% Furnace)

High Efficiency Furnace: 10% - 15%

(100K BTU 96% Furnace)

Elements of an HPwES Job

- Audit
- Solution
- Retrofit
- Commissioning
- Quality Assurance



sustainable spaces
HOME PERFORMANCE RETROFITTERS

Whole Home Solution

Scope of Work, Hybrid Residence

The following estimate is valid for 30 days. It does not include...

- 1 Duct Sealing**
 - All ducts sealed with Sustainable Space
 - Reduce the amount of energy released
 - Can reduce allergy irritants, dust, dander
 - Seal when operated with air balancing
 - Provide test out certificate with proof of
- 2 Building Envelope Sealing (Air Sealing)**
 - Prevents conditioned air from escaping
 - Improves air quality by reducing infiltration
 - Reduces infiltration of outdoor air pollutants
 - Improves energy efficiency
 - Provide test out certificate with proof of
- 3 Attic Insulation**
 - Reduces indoor temperature variations
 - Maintains comfortable environment year
 - Slows heat transmission
 - Reduces energy bills
 - Sustainable Spaces uses recycled blown
- 4 Wall Insulation**
 - Reduces indoor temperature variations
 - Maintains comfortable environment year
 - Slows heat transmission
 - Reduces energy bills
 - Sustainable Spaces uses recycled blown

SUSTAINABLE SPACES
we make h



Steps in the HPwES Program

- Online energy profile
- Call from LEAP
- In home comprehensive assessment (test in)
- Energy improvements
- Test out
- Quality Assurance check
- Certificate is mailed



ONLINE ENERGY ASSESSMENT



Free, Accurate, and Easy

Your Home Energy Report

Take LEAP's confidential survey and create your home energy profile. You'll get an energy ranking, savings estimate, and unbiased, cost-effective upgrade advice.

It really only takes five minutes, and it's fun!



Type of home

- Single family home
- Apartment, condo or townhome
- Other

Year Built

Enter the year that your home was built even if it's been remodeled since then.

1970

Occupants

The number of people that normally live in your home.

3

Floors

Don't include your basement, garage or attic unless they're heated living space.

2

Size in Square Feet

Don't include garages or patio areas unless they are finished and heated.

2000

Location

Your home's Zip Code.

22932

Continue →



Your Energy Profile

You look like a great candidate for LEAP's Home Performance with ENERGY STAR program.

With an energy retrofit, you should be able to save a significant amount on your utility bills.

The next step: meet with one of our LEAP-Certified home energy performance experts to verify your potential and save thousands with bundled cash rebates for energy improvements to your home. Special 0% financing offers available.

Your house in Crozet, VA (area) is one of the least efficient in your neighborhood

\$4,164

POTENTIAL 3-YEAR SAVINGS

[Get Started Now! ➔](#)

Your Customized Action Plan

Air seal and control ventilation to eliminate drafts

Sealing up leaks in your home's exterior is often one of the most cost-effective ways to improve home energy efficiency by significantly reducing the loss of conditioned air.

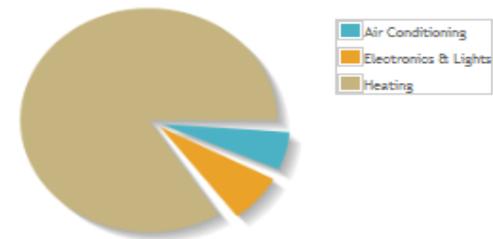


Upgrade attic insulation to modern standards

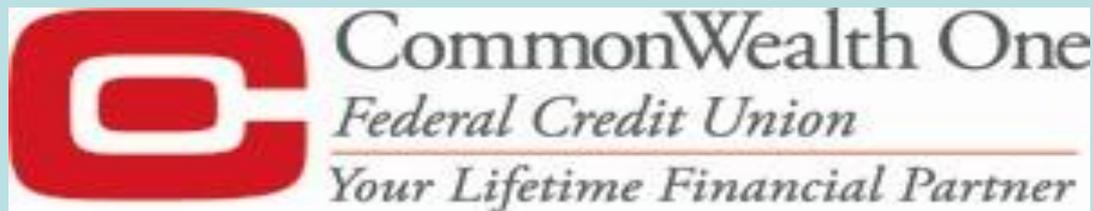
Air seal and insulate your ducts

Consider a higher efficiency heating system

Upgrade to a modern high efficiency refrigerator



Potential 3 year savings: \$4,164



Alexandria Energy Saver Loan

You are eligible to apply for this loan if you own a home in the City of Alexandria and are improving it with a qualifying Energy Efficiency project as outlined by the LEAP program.

Rates as low as 4.90% APR

- Median household income limits apply
- Borrow up to \$20,000 for a maximum of 10 years
- Sample payment: borrow \$3,000 for 60 months, pay only \$57 per month!

Home Performance Loan

If you live in select areas of Northern Virginia outside of the City of Alexandria and Washington, DC, and own your home, you may be eligible to apply for this loan when completing your qualifying Energy Efficiency project as determined by the LEAP program.

- Rates as low as 7.90% APR
- Borrow up to \$20,000 for a maximum of 10 years
- Sample payment: borrow \$10,000 for 84 months, pay only \$155 per month!

Cash Rebates!!

**\$100.00 off of an assessment
when you reach the goal of 20%
more efficient for Residential
Homes**

Guidelines for Work Performed

- **Any door hatch or access that can't be properly sealed and insulated should be repaired, replaced or reconfigured.**
- Attic hatches should be weather stripped to be air tight and insulated to at least an R 28 with rigid insulation.
- Insulation should be permanently attached, and clean sides covered with foil skim tape.
- Pull down stairs should be weathered stripped and covered with a box fabricated out of 2" RFI R 14 or retrofitted with a prefabricated off shelf unit.
- Doors should be weather stripped, have sweeps, close securely and be insulated as well as walls are to an R13 to complete pressure/thermal boundary.
- Attic accesses should be weather and vermin proof.
- Knee wall doors and hatches should be air tight and open easily if accessed frequently. They should be insulated with 2" RFI to an R 14 or something equivalent. Insulation should be secured to the back, and clean sides covered with foil skim tape.
- Crawlspace hatch in wet areas should be constructed out of pressure treated wood and have 2" of Dow Styrofoam on back side for an R 10.
- Floor hatches should fit securely, be air tight, and have 2-3" of RFI on back side. Sides should be clean with foil skim tape.
- Crawlspace accesses should easily open, should be secured, and be weather and vermin proofed. Use pressure treated wood if a persistent moisture condition exists.

LEAP Home Performance with ENERGY STAR Guidelines v.2
Required Standards, Best Practices, and Program Information for Participating Contractors



leap HOME PERFORMANCE WITH ENERGY STAR

Energy Efficiency Quiz

Rank the following in order of importance:

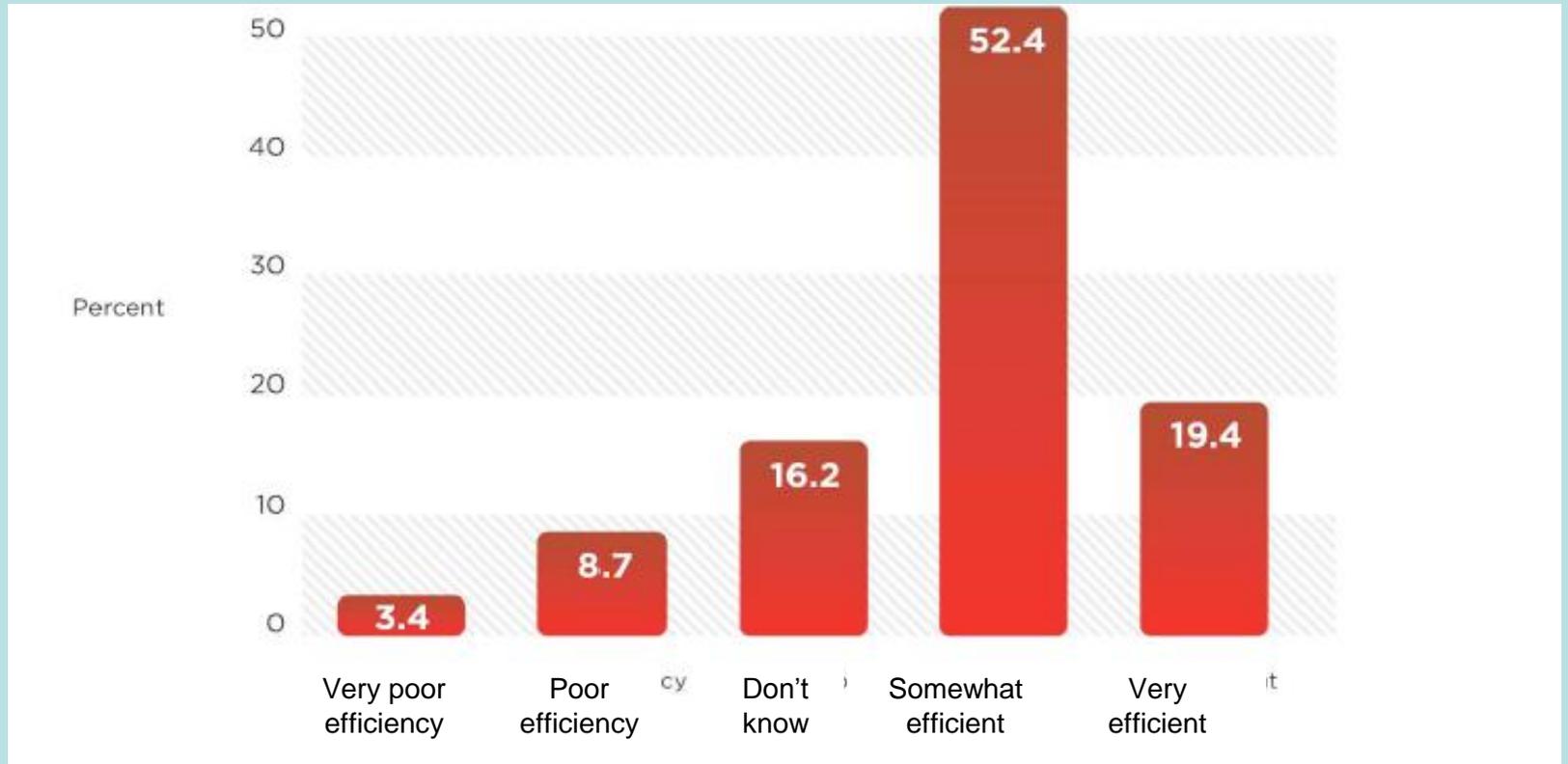
- Windows/Doors
- Air Leaks
- Attic Insulation
- Wall Insulation
- Basement/Floor Insulation

Energy Efficiency Quiz

Rank the following in order of importance:

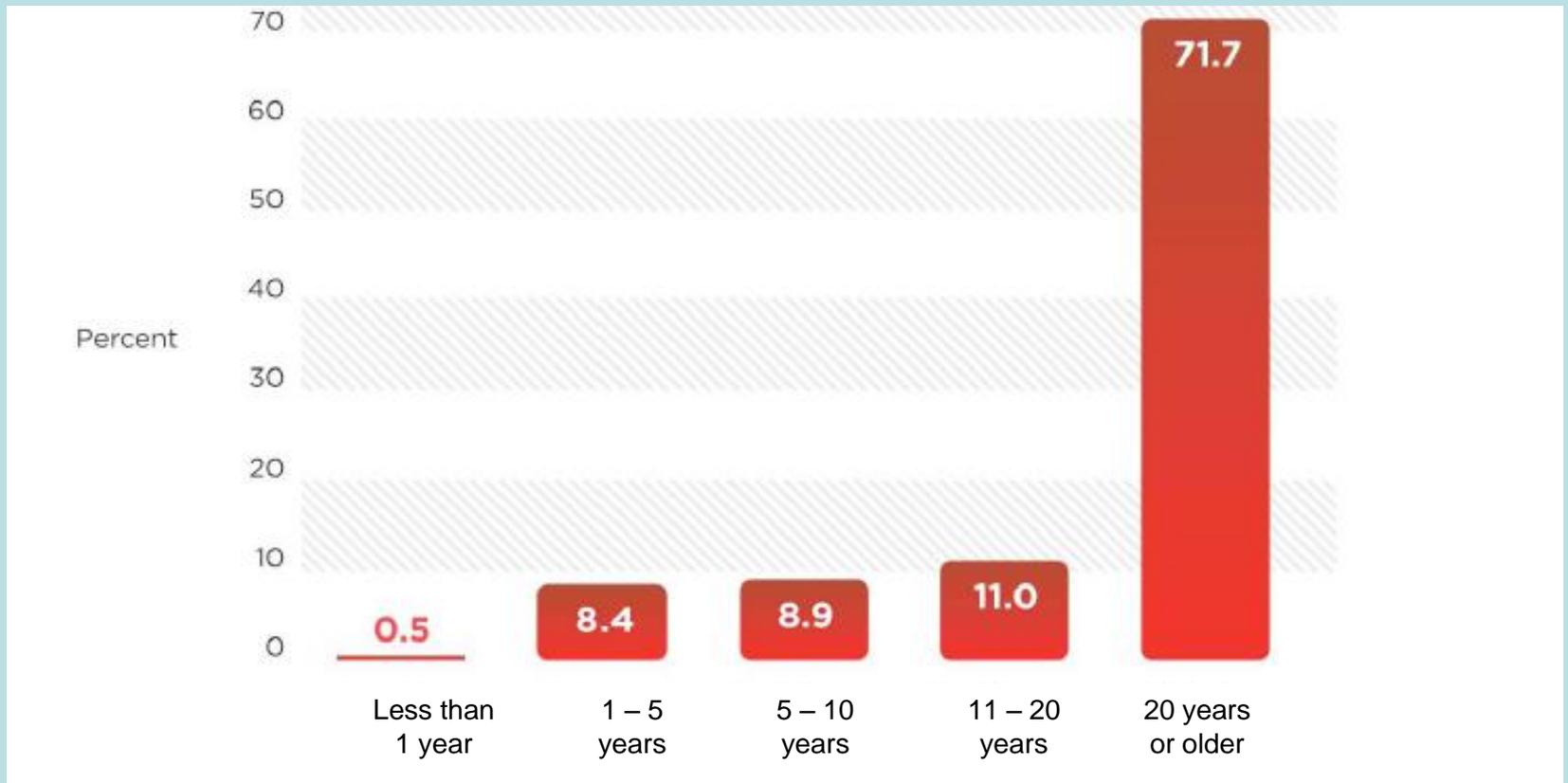
1. Air Leaks
2. Attic Insulation
3. Basement/Floor Insulation
4. Wall Insulation
5. Windows/Doors

Misperceptions



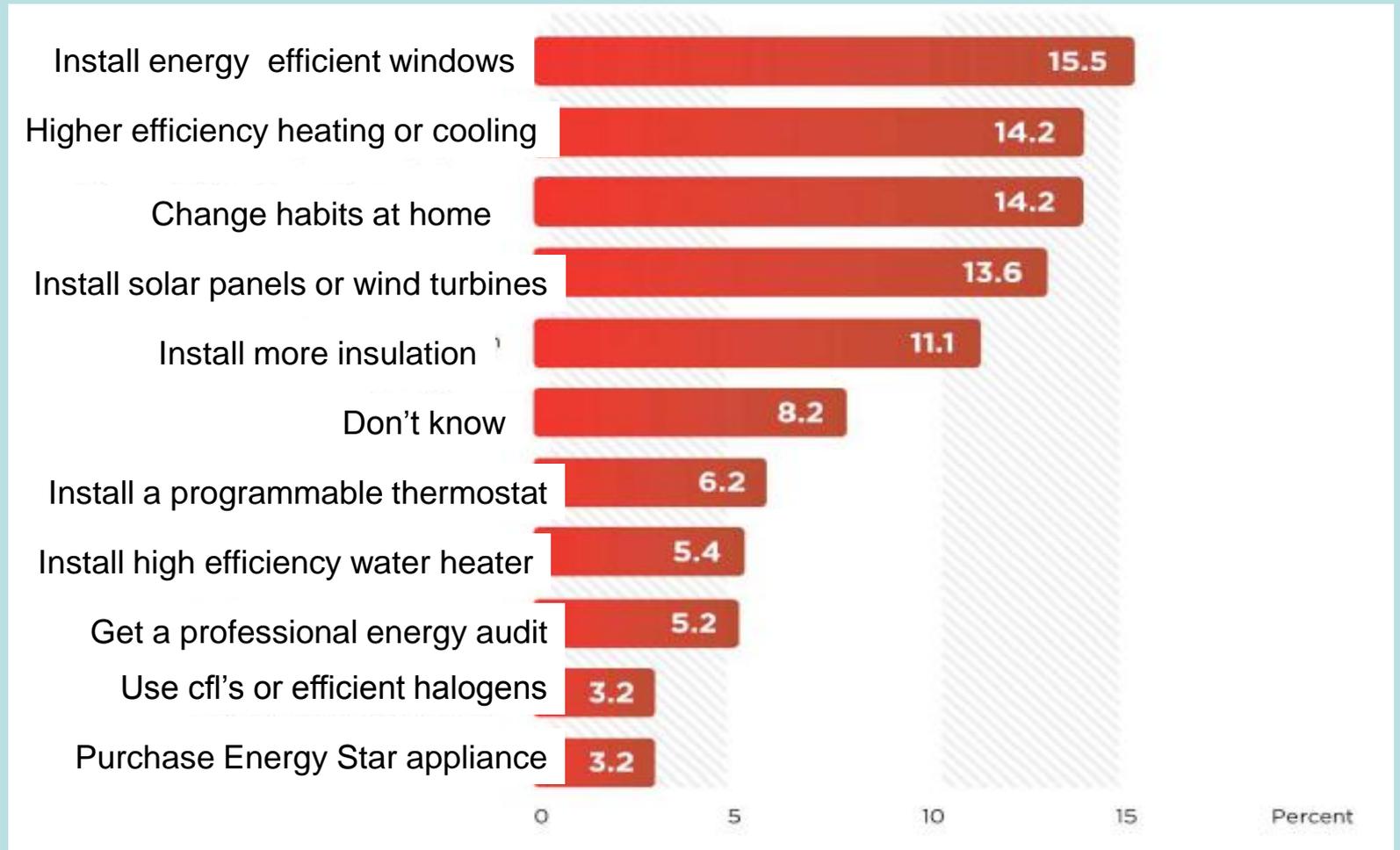
How energy efficient is your home?

Misperceptions

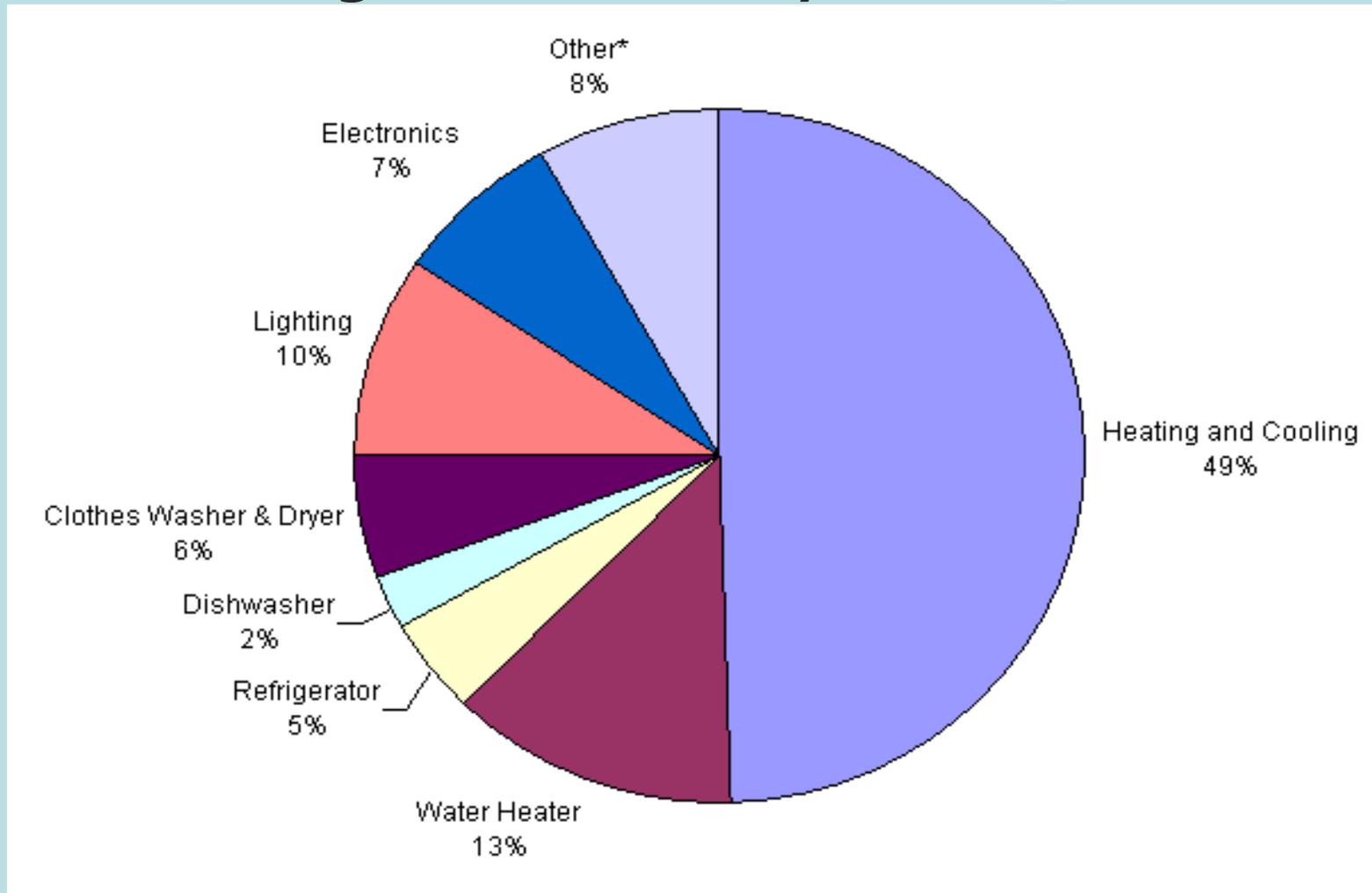


How old is your home?

Misperceptions



Average annual utility bills \$2,200



Your House is a System...

....of interdependent parts.

- The operation of one part affects many others.
- When they all work together, the house is comfortable, safe, efficient, and durable.

A house will experience problems when its house parts don't work together properly.

- Some obvious, some invisible.
- Some now, some years down the road.

Example



An un-insulated attic ...



Photos courtesy of NRCERT

Makes the heating and cooling system work harder than necessary.

Example

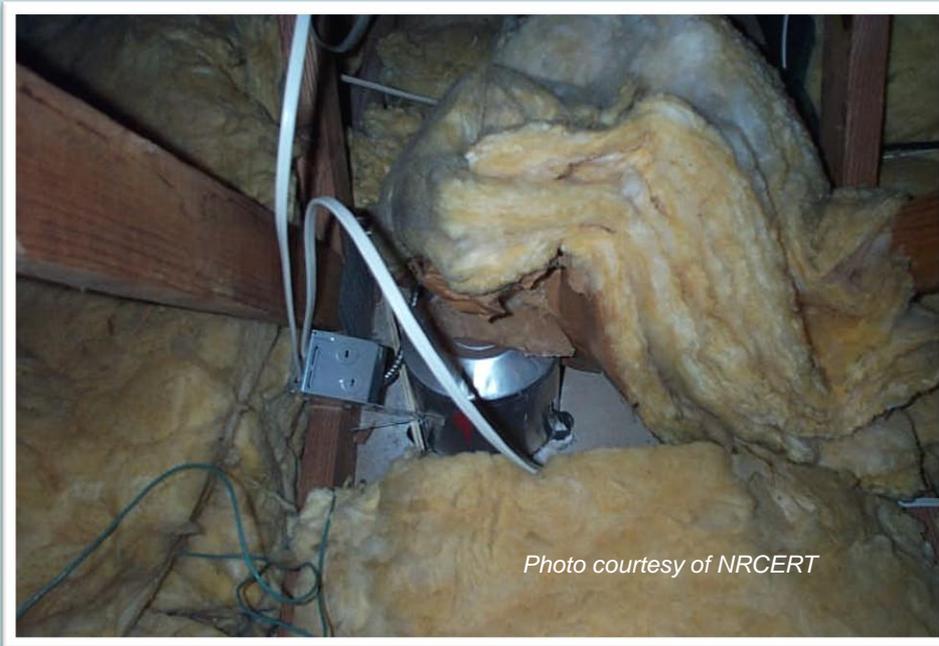


This bathroom exhaust fan does not exhaust to outdoors – just to the soffit.



The moisture condenses on the roof deck and trusses causing damage.

Example



Leaky recessed lighting fixtures...



Increases heat loss/gain, and can cause ice dams and moisture problems.

**There are three major
components to your house
energy system**

#1 The Shell or Building Envelope



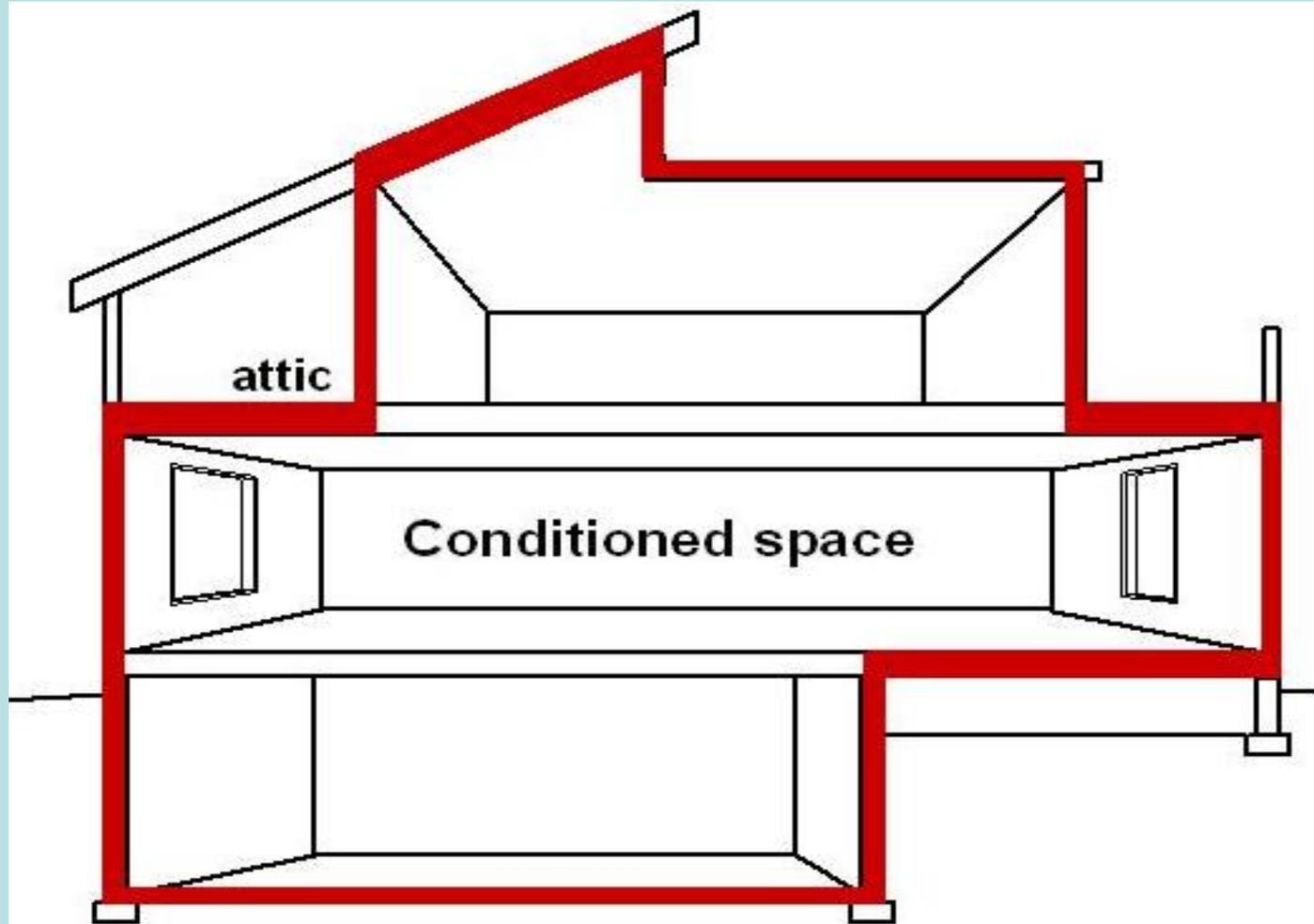
#2 Mechanical Systems



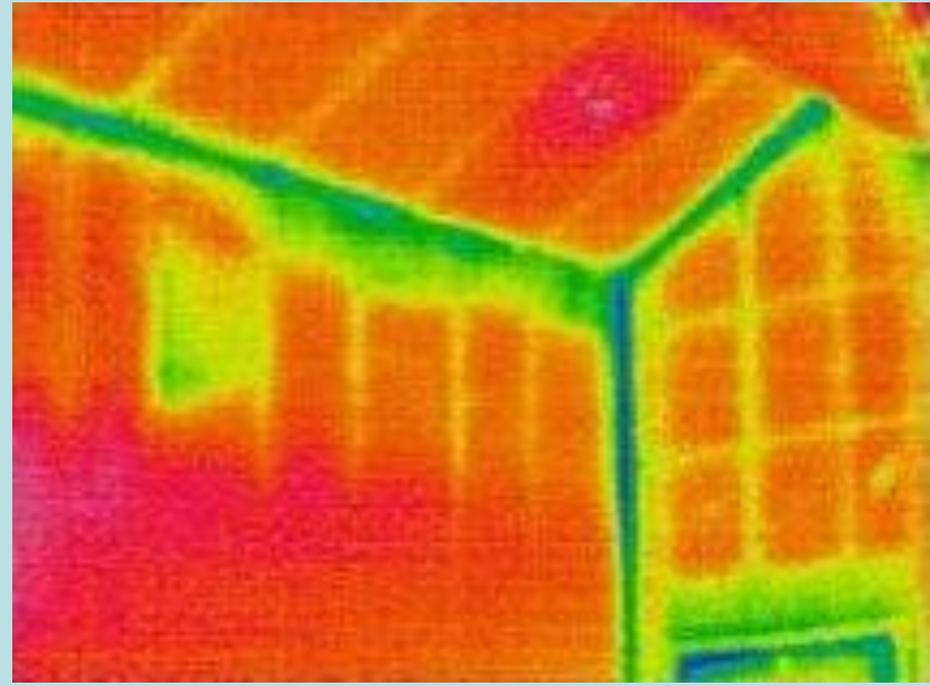
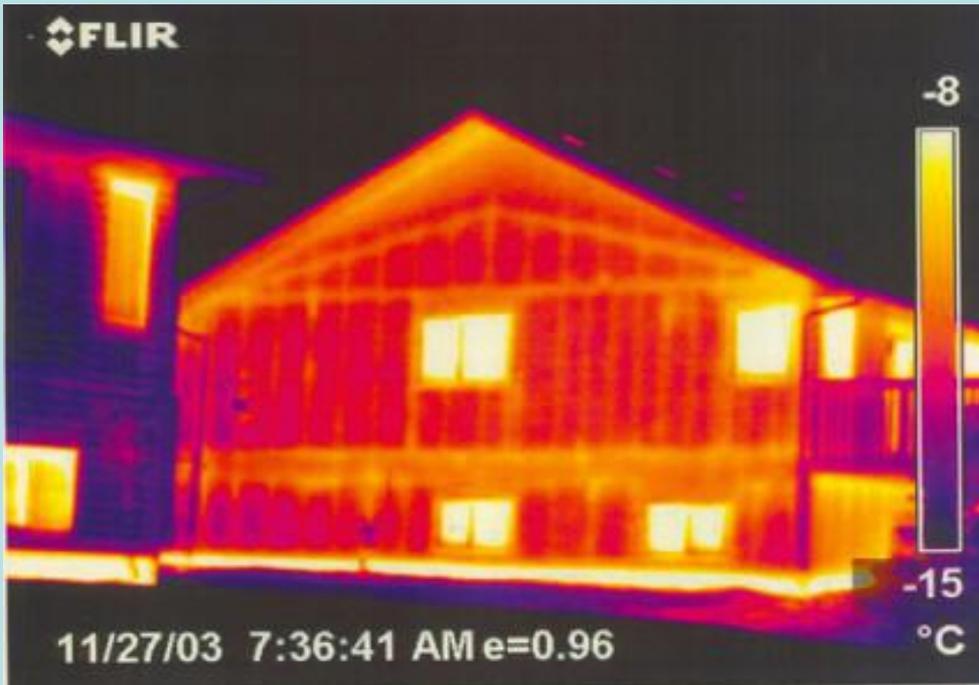
#3 People



The Building Shell



Many of our homes are built with 2x4 wood framing and prone to problems



Building Shell Holds in Air

You need “new” air **when you are home.**

.35 whole house air changes per hour is required

Most current US homes are far above that.

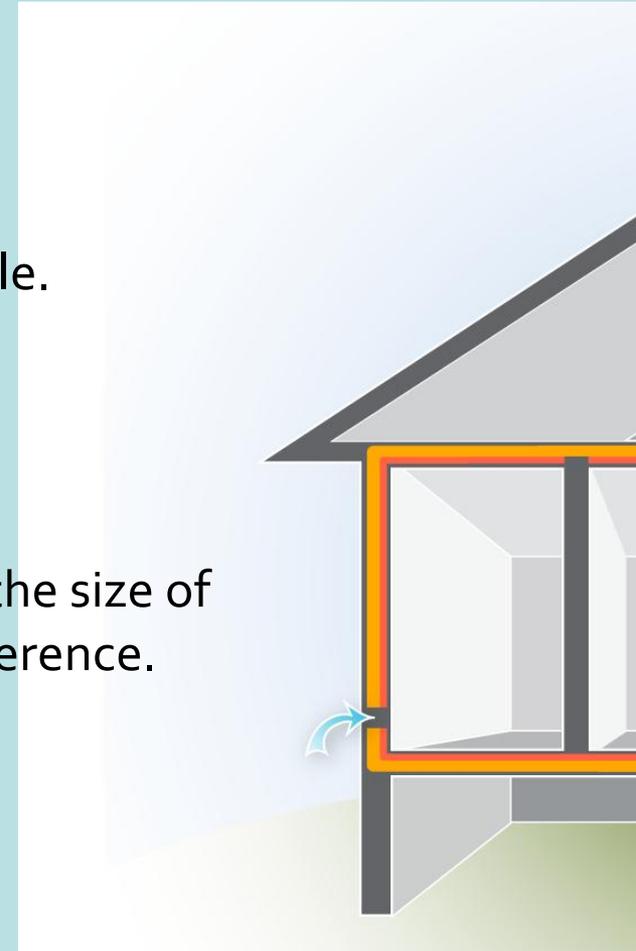
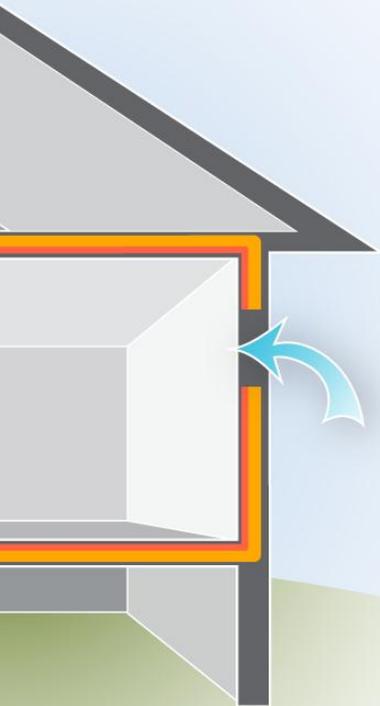
In Northern Virginia we typically find **.7 to 2.5** whole house air changes per hour.

Yes, your house could be leaky.

Air Leakage

Air Leakage requires:

- A hole.
- Pressure difference across that hole.
- The bigger the hole or higher the pressure difference, the more airflow.
- To reduce airflow, we can reduce the size of the hole or lower the pressure difference.

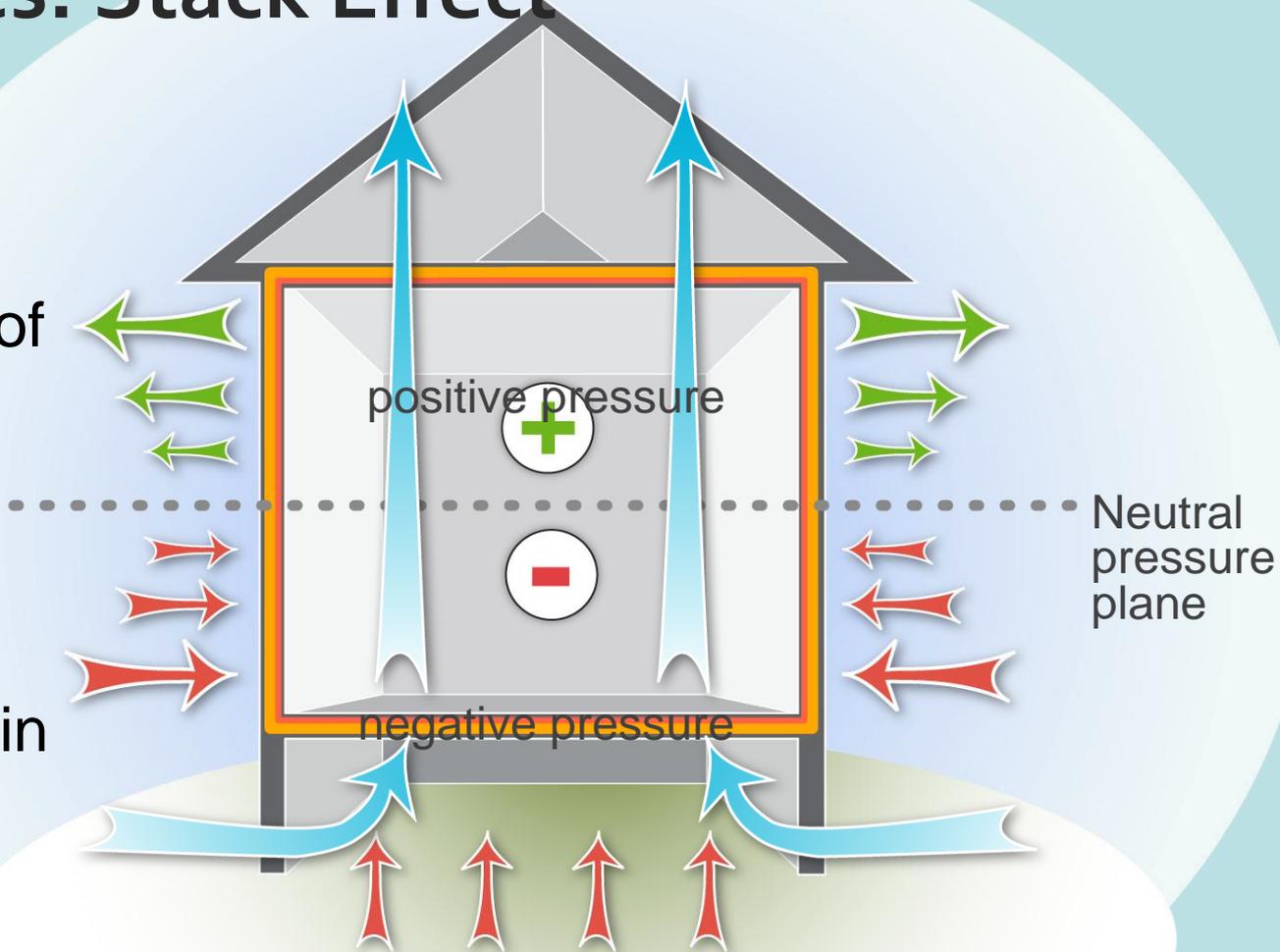


Driving Forces: Stack Effect

Stack Effect

Warmer air rises and escapes out of the top of the house. . .

Which creates a suction that pulls in outside air at the bottom of the house.



PRESSURE & THERMAL BOUNDARIES



PRESSURE & THERMAL BOUNDARIES



PRESSURE & THERMAL BOUNDARIES



Attic Hatches



Insulated Attic Stair Hatches



Often overlooked leakage areas: the sill plate and rim joists







Home Insulation

- Loose
 - Cellulose
- Batt
 - Fiberglass
 - Cotton/Denim
- Foam
 - Closed Cell
 - Open Cell



TYPICAL WEATHERIZATION MEASURES



Forced Air Systems

- Ducts leak, on average 20% of the conditioned air is lost and not applied where it should be.
- Ducts should be insulated if they are in your attic or crawlspace.
- Good duct sealing costs several hundred dollars. But that will cut heating and cooling costs in many homes by 20%.

TYPICAL WEATHERIZATION MEASURES



TYPICAL WEATHERIZATION MEASURES



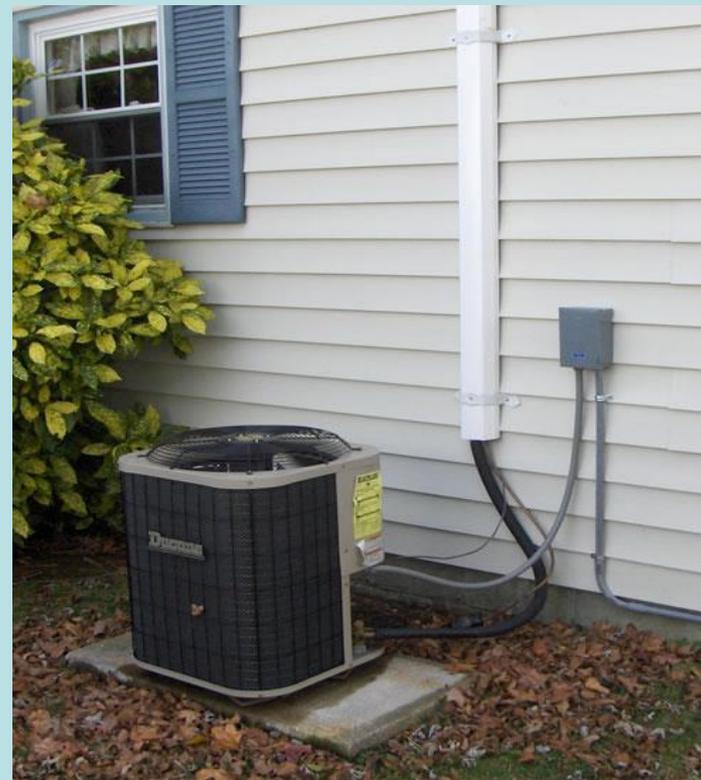
Replace your existing furnace?

- If your furnace or boiler is older than 20 years. <65% efficient
- New Energy Star rated above 90% AFUE.
- Proper Sizing is important (less air leakage can mean smaller system)
- Work with a LEAP Certified contractor



What about Heat Pumps?

- Buy SEER rating 14.5 and above
- Proper sizing important
- Work with a LEAP certified contractor



Lighting

- Use natural day-lighting
- Work with color and reflectance of paints
- Reduce background light levels. Rely more on task lighting
- Dimmers are good
- If you must use incandescent, higher wattage is better
- Use linear (tube) fluorescent lighting where design permits
- Turn lights off or install sensors
- Switch to LED holiday lights

Electronics in entertainment center in their OFF Mode, the meter still runs...



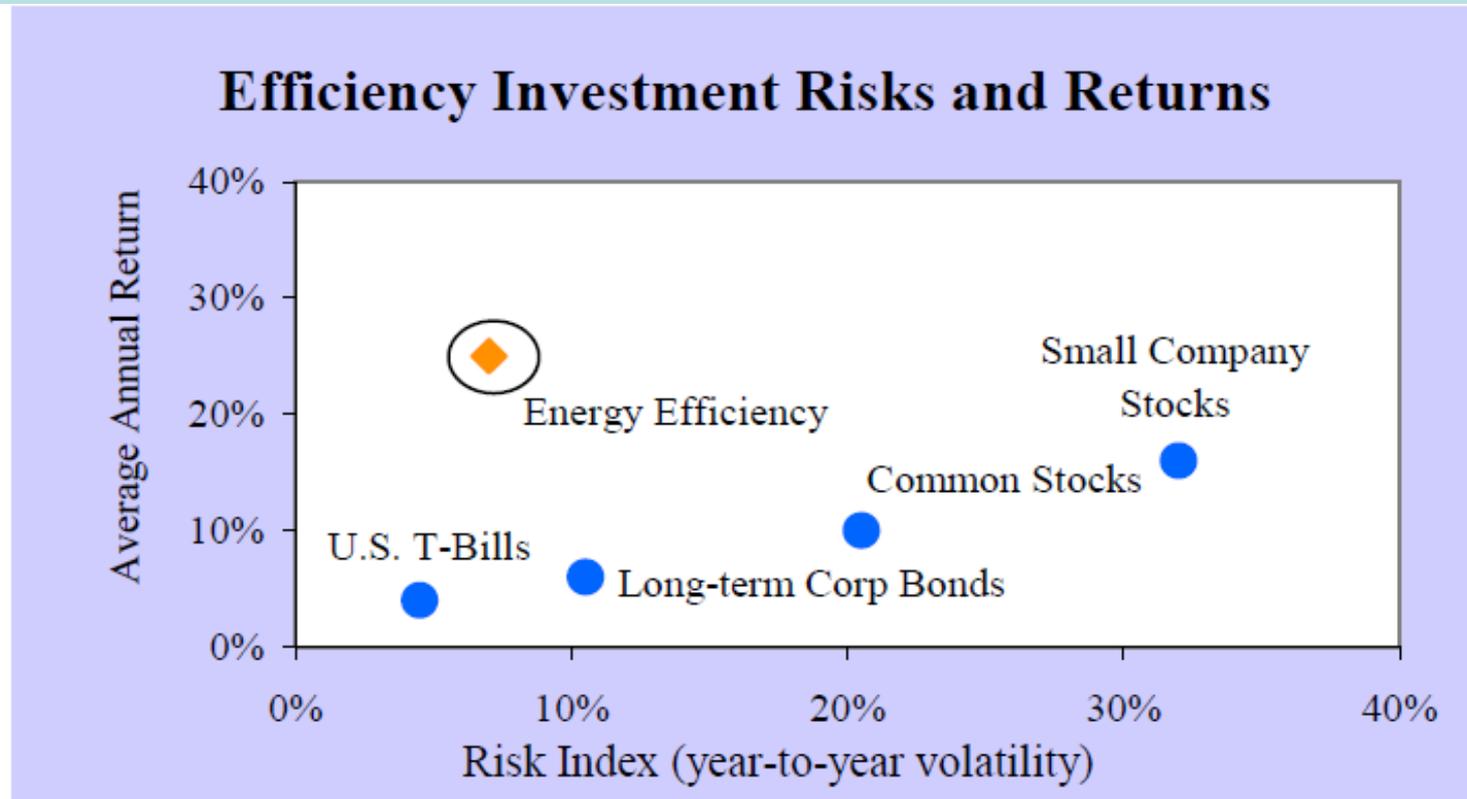
Save 122 kWh/yr (\$15.26) by switching power cord off when not using these electronics



Average Payback per Improvement

Item	Average Rate of Return
Compact Fluorescent <u>Lightbulbs</u> (CFLs)	30-100%
Air Sealing	20-40%
Insulation	20-35%
Furnace	10-25%
Hot Water Heater	10-25%
Solar Hot Water Heater	10-20%
Solar Electric Systems	8-14%
Windows and Doors	2-7%

Efficiency is a Sound Investment



Source: Adapted by ACEEE from the EPA and the Vanguard Group (see Laitner 2008)

Good for your community too!

**“Every \$1 spent on energy efficiency
is \$8 into your local economy”**

EPA Energy Star Manager

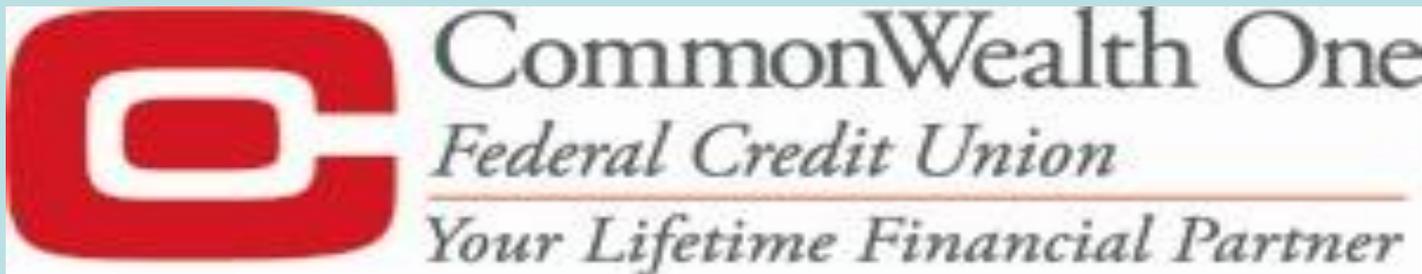


www.leap-va.org

info@leap-va.org



Alexandria Energy Saver Loan Program



Goals and Background of Program

- Reducing residential energy use
- Community benefits
- Reduced utility costs to consumers
- Help homeowners overcome common barriers to making energy efficiency improvements

Alexandria Energy Saver Loan Program

How is the City supporting the Loan Program?

- Energy Efficiency and Conservation Block Grant (EECBG)
 - Capital Improvement Program (CIP) funds
- Ready to start? Go to ilikeleap.com

*HPwES requires a 20%
projected efficiency gain

Alexandria Energy Saver Loan Program

The Partnership –

- The City of Alexandria
- LEAP
- CommonWealth One Federal Credit Union
- Northern Virginia Regional Commission

***HPwES requires a 20%
projected efficiency gain**

Alexandria Energy Saver Loan Program

The Process:

- Participants complete free online energy report
- LEAP conducts home visit and completes energy assessment
- LEAP connects homeowner with financing and rebates
- Homeowner selects participating contractor

*HPwES requires a 20%
projected efficiency gain

Alexandria Energy Saver Loan Program

Loan Program Details

- Eligible loan amounts: \$3,000 to \$20,000
- Term(s): Up to 15 years
- Interest Rate: 4.90%
- Payments: Simple interest – fixed payment, minimum payment of \$45
- Income limits: Serves Alexandria households up to 100% of AMI

*HPwES requires a 20%
projected efficiency gain

Alexandria Energy Saver Program Income Limits

- 1 person - \$75,300
- 2 people - \$86,000
- 3 people - \$96,800
- 4 people - \$107,500

***HPwES requires a 20%
projected efficiency gain**

Alexandria Home Performance Loan

- No income limits
- Interest rate of 7.90%
- Loan of up to \$20,000 for a maximum of 10 years
- Sample payment: borrow \$10,000 for 84 months (7 years), pay only \$155 per month

***HPwES requires a 20%
projected efficiency gain**

Based on the results of the energy assessment*, loan funds may be used for

- Whole house sealing
- Insulation
- Duct sealing
- Skylight replacement
- Door, storm door and window replacement
- Heating and cooling systems
- Water heater
- Roofs
- Renewable energy systems

*HPwES requires a 20%
projected efficiency gain

The Process

1. Free Online Energy Report

Go to www.ilikeleap.com to start

2. Energy Assessment

An expert personally visits your home to identify the key issues and solutions

3. Financing & Rebates

Connect with LEAP and your local Credit Union for best financing options

4. Transform Your Home

Choose a contractor and begin work!

*HPwES requires a 20%
projected efficiency gain

For more information:

Shane Cochran

City of Alexandria Office of Housing

703.746.4990

shane.cochran@alexandriava.gov

CommonWealth One FCU, Lending Dept.

703.523.8211, ext. 7611

lending@cofcu.org

*HPwES requires a 20%
projected efficiency gain



Natural Gas. *Efficient by Nature.*

Washington Gas

Benefits of Natural Gas & Energy Efficiency Program -- Rebates





Natural Gas. *Efficient by Nature.*

Benefits of Natural Gas

- **Natural gas is far and away the preferred fuel choice for home heating, water heating, cooking and fireplaces. It's easy to see why. When you compare natural gas to electricity, natural gas:**
- **Produces air that is 30 degrees hotter than a heat pump.**
- **Cooks twice as many meals for the same cost.**
- **Heats water twice as fast.**





Natural Gas. *Efficient by Nature.*

Benefits of Natural Gas

Homeowners who choose natural gas are not only doing their part to reduce greenhouse gas emissions but also can significantly reduce their energy bills. On average, the energy bills of homes using natural gas are:

- 30 percent lower than all-electric homes
- 34 percent lower than oil homes
- 45 percent lower than propane homes.





Natural Gas. *Efficient by Nature.*

Converting to Natural Gas Easy Steps

- Customer determines availability of Natural Gas
- Customer and / or equipment contractor submits the required conversion paperwork to WG
- WG prices underground gas line and meter installation
- Customer returns signed Commitment Letter
- WG applies for all necessary permits and permissions





Natural Gas. *Efficient by Nature.*

Converting to Natural Gas Easy Steps

- Washington Gas underground subcontractor contacts customer to schedule installation
- Utility locating service will mark all public underground utilities
- WG underground subcontractor installs gas line/ meter
- Equipment contractor to completes installation / schedules equipment inspections





Natural Gas. *Efficient by Nature.*

Adding/ Replacing Natural Gas Appliances

- Contractor verifies the total BTU output ratings for all appliances / equipment mfg's pressure requirements
- Contractor contacts WG to validate service line capacity and existing gas pressure
- Contractor submits the Meter Request form to WG
- WG meter subcontractor will contact customer to schedule





Natural Gas. *Efficient by Nature.*

Energy Efficiency Program

**12,550 Rebates Totaling Nearly
\$1,000,000
for our Virginia customers only**





Natural Gas. *Efficient by Nature.*

www.Washingtongasrebates.com

- Dates Available: May 1, 2012 – April 30, 2013
- Eligible Appliances
- Rebate Forms
- How to Apply for a Rebate
- FAQ
- Need a Contractor?





Natural Gas. Efficient by Nature.

Energy Efficiency Program Available Gas Equipment Rebates	<u>Offer Number</u>	<u>Amt per Rebate</u>	<u>No. of Rebates Available</u>
Natural Gas Heating System Checkup	WG1111		
OR Programmable Thermostat (Only 1 Rebate per household for Checkup or Thermostat)	WG2222	\$30	8,500
Natural Gas Boiler Replace, 85% or greater Annual Fuel Utilization Efficiency (AFUE)	WG3333	\$250	210
Natural Gas Water Heater Replace - .62 or greater Energy Factor (EF)	WG4444	\$50	*1420
Natural Gas Water Heater Replace - .82 or greater (EF)	WG5555	\$250	*1420
Natural Gas New Home - Energy Star Certification, Space & Water Heating (Both Required)	WG6666	\$250	1,000
Natural Gas Water Heater New Home - .62 or greater (EF) & Energy Star Certification Required	WG7777	\$50	*1420
Natural Gas Water Heater New Home - .82 or greater (EF) & Energy Star Certification Required	WG8888	\$250	*1420

*The number of water heater rebates is 1,420 for .62 EF & 1,420 for .82 EF (Includes both replacements & New Home Programs).





Natural Gas. *Efficient by Nature.*

Contact Information

Mike Dearing

Trade Relations

703-750-5945

rdearing@washgas.com

Roger Moffatt

Energy Efficiency Programs

703-750-7706

Rmoffatt@washgas.com



Alexandria's Energy Audit Pilot Program

- Interest in promoting energy assessments and identifying common results potentially applicable to common building types
- Addressed these building types
 - Single-family residential, duplex, or townhouse
 - Multi-family residential (4 stories or less)
 - Small business or office (15,000 or less)
 - Large office (50,000-70,000 sf or less)

Carried out by EarthCraft Virginia and 2rw Inc., part of the consultant team led by Sustainable Design Consulting

Alexandria's Energy Audit Pilot Program

Assessment goals:

- Determine electric energy use in sample buildings
- Evaluate means to reduce energy use

Process involved examining energy bills, insulation, air tightness, mechanical equipment, windows, health and safety issues, indoor air quality, moisture management, and indoor water usage

Two types of assessments were used:
survey and comprehensive audit

Residential and Small Retail Buildings in the Audit Pilot

- Assessment 1- Comprehensive audit performed on a multifamily property
- Assessment 2- Energy survey performed on a single family attached home
- Assessment 3- Comprehensive audit performed on a single family detached home
- Assessment 4- Energy survey performed on a single family detached home
- Assessment 5- Energy survey performed on a single Family attached home
- Assessment 6- Comprehensive audit performed on a commercial restaurant
- Assessment 7- Comprehensive audit performed on a single family detached home
- Assessment 8- Comprehensive audit performed on a single family attached home



5 audits and 3 surveys

Commercial and Multifamily Buildings in the Audit Pilot

- Comprehensive energy audit performed on a condominium
- Comprehensive energy audit performed on a church and school facility
- Comprehensive energy audit performed on a condominium
- Energy survey performed on a transitional housing shelter



Walk-Through Surveys vs. Building Energy Audits

Energy Surveys are more general than audits and include the following:

- customer interview
- energy analysis
- building envelope features
- heating and cooling equipment types
- appliance and lighting characteristics
- comfort complaints
- visible health and safety issues

Walk Through Surveys vs. Building Energy Audits

Building audits are more in depth and involve the following specialized equipment:

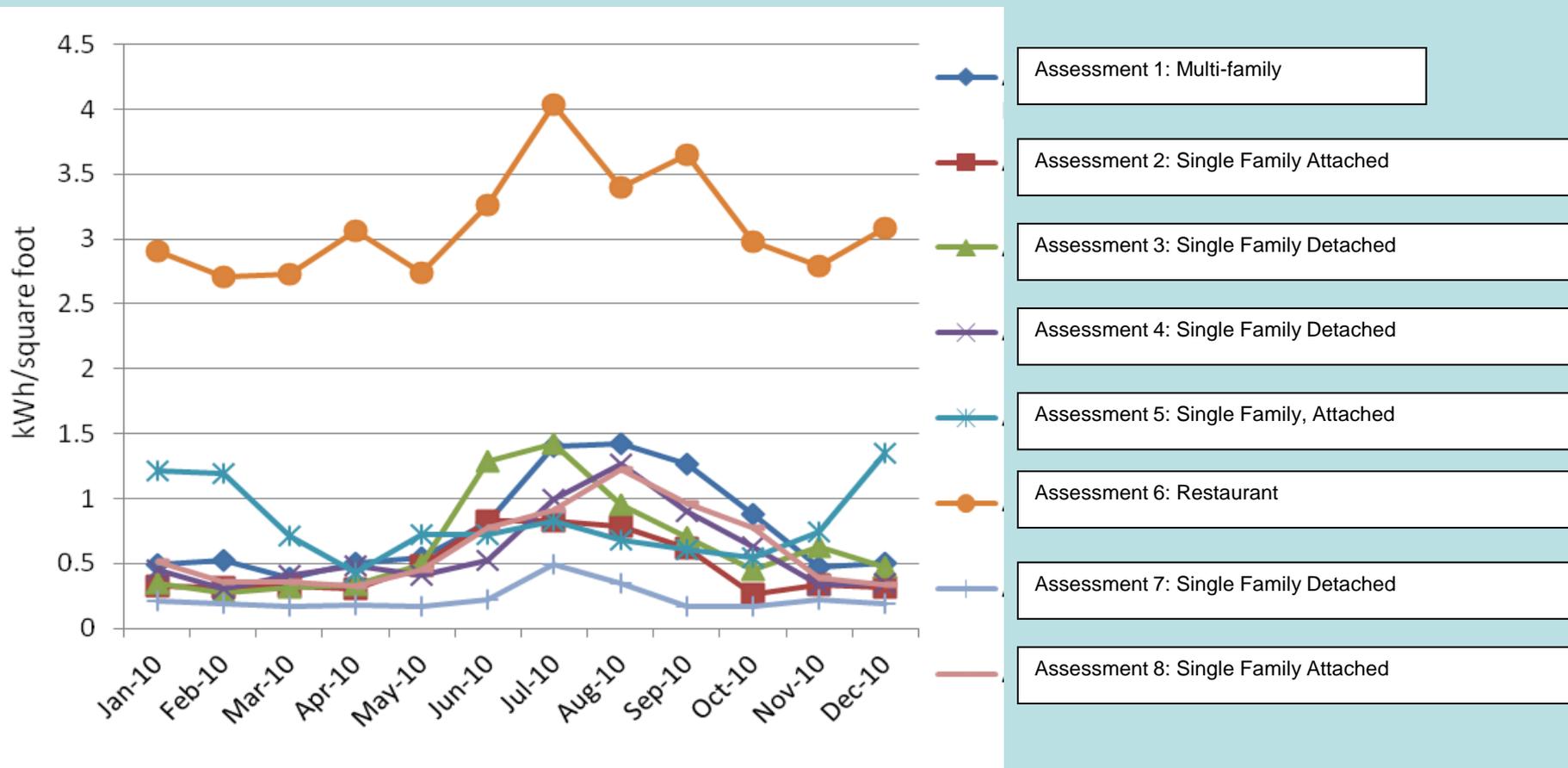
- blower door
- duck leakage apparatus
- combustion analyzer
- gas leak detector
- infrared camera

Results of Utility Data Analysis for Residential and Small Retail

- Energy use is divided up into base load (appliances etc.) and seasonal use (heating and cooling)
- Greater seasonal use is a sign of an inefficient thermal envelope
- More thermally efficient homes show a greater percentage of base load energy use

Results: Residential and Small Retail

Utility Usage per Square Foot



Water Analysis: Residential and Small Retail

- Water billed quarterly by ccf (100 cubic feet of water)
- Bills varied very little between residences
- Some residences already had water efficient fixtures in place
- Outdated fixtures were recommended to be replaced

Common Opportunities for Improvement: Residential and Small Retail

-Building Envelope Tightness

- Blower door testing was conducted to determine building envelope tightness in 5 structures
- The results were measured in (ACHn) which indicates the volume of air in cubic feet per minutes (cfm) that goes in or out of a building during the course of a year.
- Air infiltration/exfiltration can typically account for 30% of a home's energy use
- Typical causes of leakage are lack of weather stripping around doors or gaps in insulation or lack of air tightness

Common Opportunities for Improvement: Residential and Small Retail -Building Envelope Tightness

Average air tightness is .35 ACH

For the 5 buildings tested, results were:

1. Multifamily Property: 0.82 ACHnat
2. Single Family Detached: 1.25 ACHnat
3. Restaurant: 0.19 ACHnat
4. Single Family Detached: 0.47 ACHnat
5. Single Family Attached: 1.1 ACHnat

Common Opportunities for Improvement: Residential and Small Retail -Duct System Tightness

- Duct leakage typically accounts for 20% of energy use in buildings with forced air distribution systems
- Duct leakage causes the building to depressurize, bringing in outside air
- Ideally duct leakage should not exceed more than 10% leakage to the outside
- Homes tested revealed numerous leakage sites

Common Opportunities for Improvement: Residential and Small Retail

-Insulation at Floors and Ceilings

- Major heat loss occurs through floors and ceilings
- Most of the buildings assessed had insulation but it was not applied correctly, had gaps, and uninsulated areas
- Attic Insulation should achieve a value of R-38 and floors should achieve a level of R-19

Common Opportunities for Improvement: Residential and Small Retail

-Low Flow Water Fixtures

- If all U.S. households installed water-saving features, we could decrease water use by 30% or 5.4 billion gallons a day
 - Water efficient shower heads rated at 1.5 gallons per minute (gpm)
 - Toilets can be replaced with Water Sense rated units that use 1.28 gallons per flush.
 - Vanity faucets can be replaced with 1.5gpm WaterSense rated fixtures

Common Opportunities for Improvement: Residential and Small Retail

-Further Energy Conservation Opportunities

- Additional options are available for energy efficiency improvements that would require a greater financial investment
- Replacing the existing duct system
- Installing ENERGY STAR HVAC systems and hot water heater
- Installing ENERGY STAR rated gas furnace
- Renewable energy technologies

Additional information: www.alexandriava.gov/gbrc

Results: Commercial and Multifamily

- All surveys and audits considered existing conditions (building envelope, HVAC systems, lighting and electricity)
- A utility analysis was done on all the buildings (electricity use and water consumption)
- Possible energy conservation measures were covered
- Recommendations were made for each building

Recommendations: Commercial and Multifamily

- Recommendations were made for condo buildings for both condo associations and individual condo owners
- For associations: Upgrade to higher efficiency lighting and HVAC systems, higher efficiency hot water boilers and piping insulation
- For condo owners: Install water conserving fixtures, use high efficiency appliances, install additional insulation between unit and common wall

Recommendations: Commercial and Multifamily

- Recommendations tailored to the Church and Carpenter Shelter included no-cost and low cost energy conservation measures
- Recommendations include lighting controls, programmable thermostats, and water-efficient showerheads
- The recommendations also included the implementation cost as well as the savings per year and the simple payback in years

Resources to Help You with Audits and Retrofits

www.alexandriava.gov/gbrc

Local Utility programs

- Washington Gas (www.washingtongasliving.com) - Rebates for gas hot water retrofit, programmable thermostats, natural gas boilers, and home energy system check ups
- Dominion (www.dom.com) - Home Energy Conservation Programs, Home Energy Calculator and other resources

Virginia programs

- ENERGY STAR and WaterSense appliance tax free holiday (www.dmme.viginia.gov)
- Solar energy equipment tax exemption (residential & commercial) offered by Alexandria City (www.alexandriava.gov – Taxation Website)

Federal incentives and programs (www.energystar.gov)

- Tax credits for renewables and geothermal installations
- Tax deductions for commercial buildings that reduce energy use

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