Green Building Workshop Series
Eco-City Alexandria Initiative

Workshop 1:
Greening Your Home, Apartment, or Small Business

February 5, 2011
9:00 am – 12:30 pm
City Hall, 301 King Street, Sister Cities Room 1101

Alexandria, Virginia

Our Speakers Today

- **William Skrabak,** Director, Office of Environmental Quality, Department of Transportation and Environmental Services, City of Alexandria

- **Barbara Ross**, Deputy Director, Department of Planning and Zoning, City of Alexandria

- **Brian Uher,** MS, MSE, CPHC, LEED AP
  Amicus Consulting Services
  Amicus Green Building Center

- **Doug Horgan,** LEED AP-Homes, CGP, CGR, GCP
  BPI Certified Building Analyst
  Vice President, BOWA

- **Annette Osso**, LEED AP, President,
  Virginia Sustainable Building Network

Workshop Overview

1. Background of Eco-City Alexandria Program and Green Building Workshop Series
2. Benefits of Greening your residence or small business
3. Do-it-yourself energy efficiency improvements for the home, apartment, or small business
4. Working with a contractor to accomplish major energy efficiency retrofits and remodeling
5. Incentive programs
6. Q&A with presenters

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**

Eco-City Alexandria

- **GREEN BUILDING POLICY**

Public Buildings

New Development

Existing Buildings

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 Loan
- LED Traffic Signals/LED Street Lights
- Renewable Energy Installation at City Facility

Green Building Workshop Series

Next Workshops, Save the Date NOW!

Energy Audits for Home and Small Business,
March 19, 2011 at Charles E. Beatley, Jr. Central Library, 5005 Duke Street

The Green Landscape: For You and the Chesapeake Bay,
May 7, 2011 at Cora Kelly Elementary School, 25 West Reed Avenue

Stay Tuned for Future Workshops

Green Upgrades in Historic Properties - **June**

Renewable Energy Systems and Green Power - **September**

Green Operations for Retail, Restaurants, Small Offices and Cultural Centers - **November**

Workshop series funded by EECBG.

ECO-CITY ALEXANDRIA

Benefits of Greening

Why find out about your building's energy use and take on the retrofit of your home, apartment or small business?

1. Increase your comfort and health
2. Reduce energy bills and water bills
3. Add value to your property
4. Do your part to help the City of Alexandria reach its Eco-City energy and environmental goals
5. Reduce your carbon emissions footprint
6. Each action is a step toward addressing climate change

Welcome

Approaches for Saving Energy: Home and Office

Green Building Workshop Series: Workshop 1

Brian Uher, MS, MSE, CPHC, LEED AP

Amicus Consulting Services
Amicus Green Building Center

www.amicusgreen.com

The Next 45 Minutes

Energy and Comfort retrofits – resources and process

Quick fixes and capital projects for homeowners

Small business approaches

Approach: You Can Manage What You Measure

- Utility bills
- Maintenance and replacement costs
- Comfort

- *Externalitites?*

Experience: What Drives the Change

3 Observations:

Most people want energy savings.

Most people pick up the phone due to discomfort.

Most people spend to solve immediate issues.

What is driving you and how do you value it?

Expectations and Outcomes

Utility savings will be incremental (example: from $200 to $150 per month)

Comfort impacts will often be noticeable (from drafty to virtually no draft)

Maintenance is usually imperceptible unless it is a driver (constant cost)

Can you adjust your perception to recognize the value?

Approach: What to Do

- Define the issues
- Define your expectations
- Identify the potential solutions
- *Next steps...verification and research*

Gathering Information: Audits

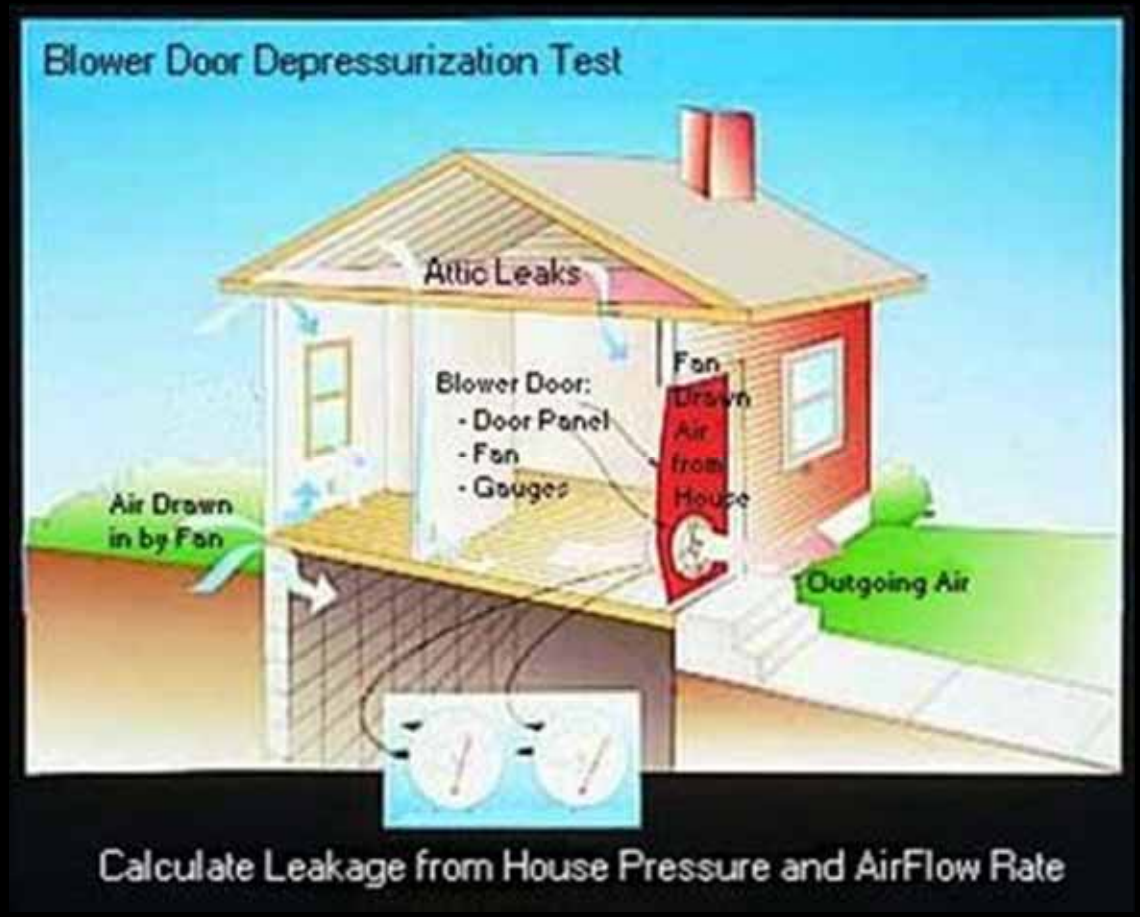
- Professionals with training and certification provide verification
- One size does ***not*** fit all
- Auditing is provided by installers due to economics

By knowing what you want, you can evaluate and direct the focus toward the solutions you want.

Gathering Information: Audits

- In Virginia, audits will provide:
- Safety testing
- Infiltration assessment
- Visual inspection

Gathering Information: Audits



Gathering Information: Audits

After an Audit, you should have:

A professional opinion on all of the issues

Some numbers against which you measure improvements

Guidance on best practices/solutions

But it's not the conclusion. An audit is not the end unto itself but the first step to your cure(s).

In the end, the decision is yours...
assessing the potential solutions is key

Gathering Information: Research

Professional Resources

Online Resources

Peer Resources

Gathering Information: Research

Professional Resources:

Dominion, EPA, DOE, VSBN, Amicus, State of Virginia, manufacturer's websites, etc.

Provide information and guidance on sourcing, facts, materials, practices, practitioners, etc.

Information is vetted

Referral impacts reputation

Potential for ongoing relationship

Gathering Information: Research

Online Resources:

EPA/Energy Star, greenbuildingadvisor.com, buildinggreen.com, YouTube.com, etc., etc., etc.

Information is not vetted

Fragmented and unaccountable

Detail oriented

Gathering Information: Research

Peer Resources:

Neighborhood listservs, Angie's List, BBB, word-of-mouth, etc.

Generally reliable

Specific to experiences

Fragmented

Gathering Information: Research

Conclusions:

Takes time; focus is important

Safety then efficacy

Don't over-think it

Develop the Action Plan

Choose the solutions that address the issues

Price the solutions

Develop a phased implementation according to needs/goals

To a man with a hammer, it all looks like a nail...

Develop the Action Plan

Goal	Strategy	Expected result	Cost	Expected ROI
reduce lighting cost	bulb retrofits	$300/yr	$450.00	67%
reduce gas bill	attic air seal and insulation	$425/yr	$3,000.00	14%
reduce water bill	shower head, toilet replacement	$280/yr	$475.00	59%
solve draft in bay window	seal and insulation cantilevered floor	no draft	$1,200.00	NA
eliminate backdraft	add venting to mechanical room	no CO backdraft	$800.00	NA

Execute the Action Plan

Strategy	Installer	Materials	Cost	Date
bulb retrofits	self	Amicus GBC	$250.00	Jan 2011
add venting to mechanical room	Acme Plumbing, Inc.	provided	$800.00	Jan 2011
attic air seal and insulation	Amicus Envelope Group	provided	$3,000.00	Feb 2011
shower head, toilet replacement	Acme Plumbing, Inc.	provided	$475.00	Feb 2011
seal and insulation cantilevered floor	Amicus Envelope Group	provided	$1,200.00	Feb 2011

Assess the Result

Goal	Expected result	Actual Cost	Actual result	Expected ROI	Actual ROI
reduce lighting cost	$300/yr	$250.00	$270.00	67%	108%
reduce gas bill	$425/yr	$3,000.00	$380.00	14%	13%
reduce water bill	$280/yr	$475.00	$292.00	59%	61%
solve draft in bay window	no draft	$1,200.00	no draft	NA	NA

Quick Fixes

Lighting

Water

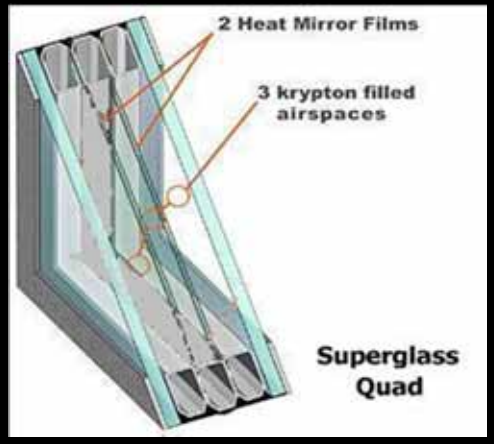
Basic air seal

Lighting

Water Use

Basic Air Seal

Capital Projects



Decorate Right

Toilet

Floor

Paint

Floor

Ideas...

Maintain & Clean Right

Clear the dryer vent

Apartments (“don’t own/control”)

Unplug automatically

Carpet you can take with you

Speak up!

Turn the lights off!
Set your thermostat back

Small Business Approaches

Small Business Approach

- Removable items/devices
- Capital improvements
- Negotiated services
- In-house processes

Small Business Approach

- Removable items/devices:
  - Same as quick fixes
- Focus on electricity, water and HVAC
- Productivity/sales are the driver

Small Business Approach

- Removable items/devices – focus areas:
  - HVAC tune-up, controls and seal
  - Lighting swap and controls
  - Water use devices
  - Electronic devices and idling loads

Small Business Approach

- Capital improvements:

- HVAC: air handler, ductwork and layout
- Lighting: ballasts and placement
- Windows: replacement, shading and skylights
- Envelope: air seal and insulation

Small Business Approach

- Negotiated services:

- Utility: pricing strategies and smart metering
- Mechanical: service contracts
- Equipment: leasing options for EE
- Cleaning: green clean

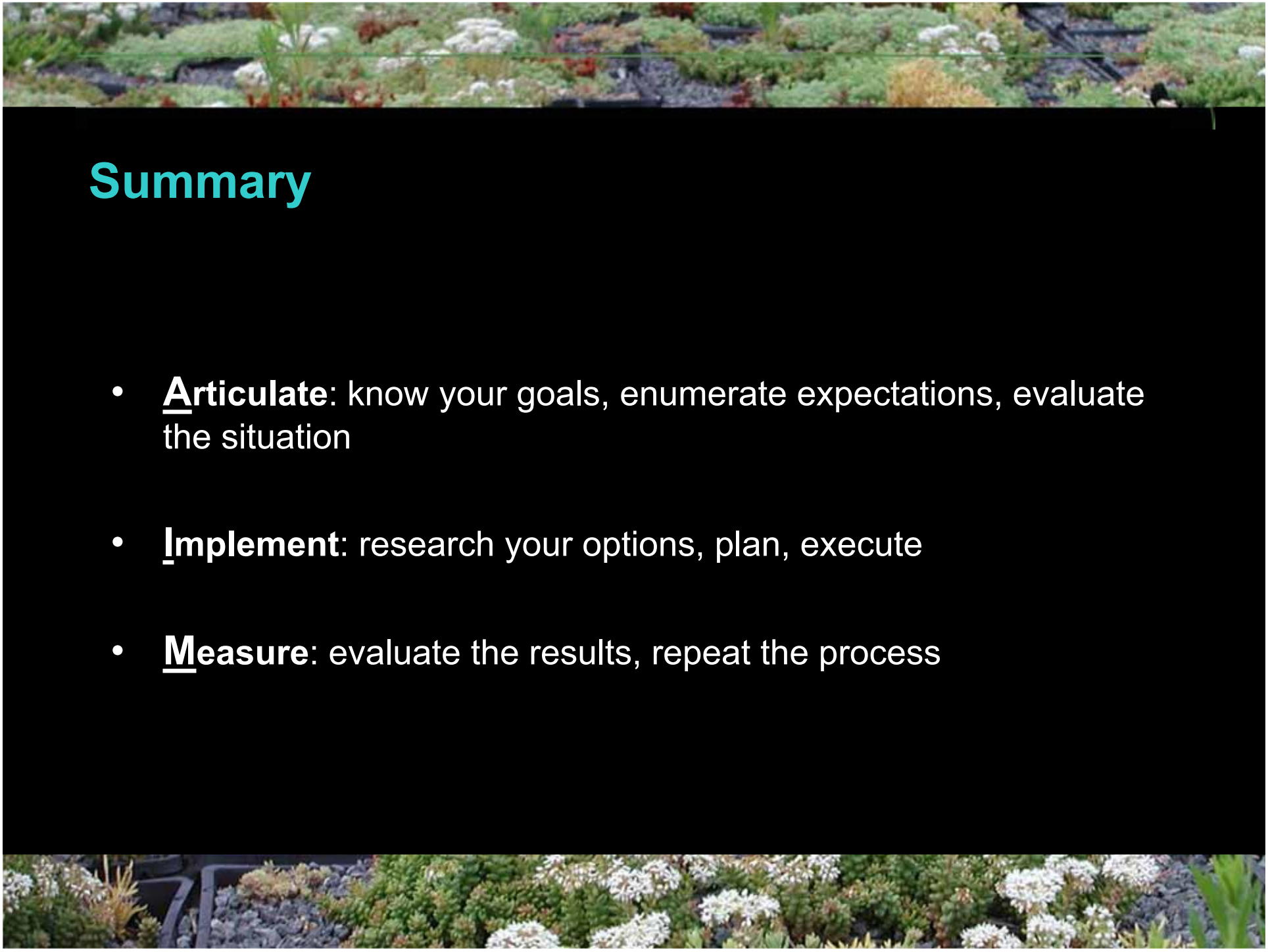
- *Other?*

Small Business Approach

- In-house processes:

- Waste: use of paper, ink, other disposables
- Lighting: tasks versus ambient
- Cleaning: green/perfume free?
- HVAC: setbacks and ramp-up
- Transport: home office time
- Networking: video conference, consolidated travel
- Information: central database
- Home greening programs for employees

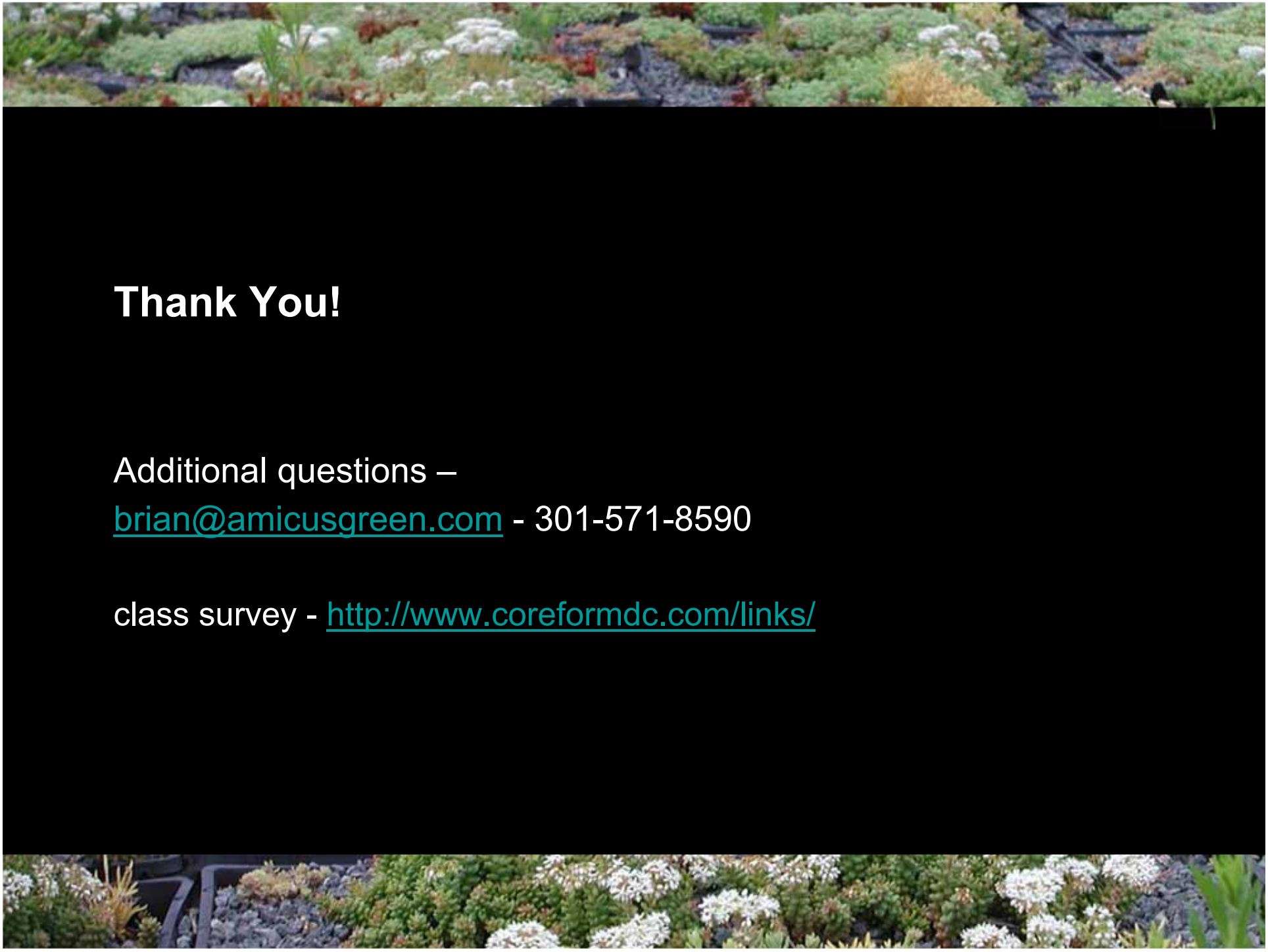
- *Other?*



Summary

- **A**rticulate: know your goals, enumerate expectations, evaluate the situation
- **I**mplement: research your options, plan, execute
- **M**easure: evaluate the results, repeat the process

Questions
And
Answers…



Thank You!

Additional questions –
brian@amicusgreen.com - 301-571-8590

class survey - http://www.coreformdc.com/links/

Green Remodeling

Green Building Workshop Series: Workshop 1

Doug Horgan
LEED AP Homes, CGP, CGR, GCP
BPI Certified Building Analyst
Vice President, BOWA

ECO-CITY ALEXANDRIA

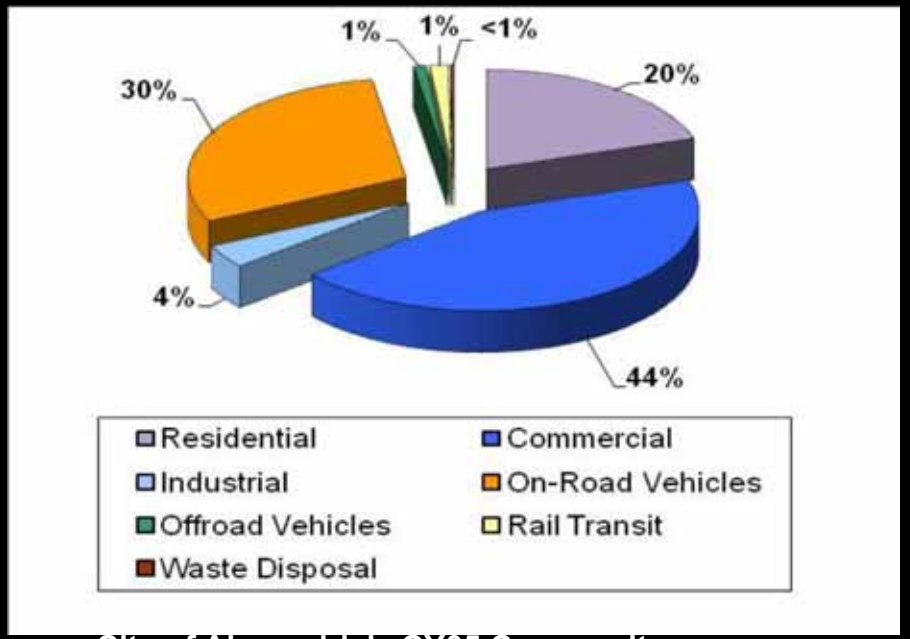
Why is Green Remodeling Important?

- Health and resource impacts are important to many of us

Why is Green Remodeling Important?

- Have to fix old houses to reduce carbon emissions

- Existing houses are among the easiest reductions



City of Alexandria's CY05 Community Consumption-Based CO2e Emissions by Sector (2.2 million tonnes)

Why is Green Remodeling Important?

- It's a good idea anyway, you'll be selling your house in a market full of 'labeled' houses

HOME PERFORMANCE WITH ENERGY STAR

SENSIBLY BUILT FOR THE ENVIRONMENT • EARTH CRAFT HOUSE • SENSIBLY BUILT FOR THE ENVIRONMENT

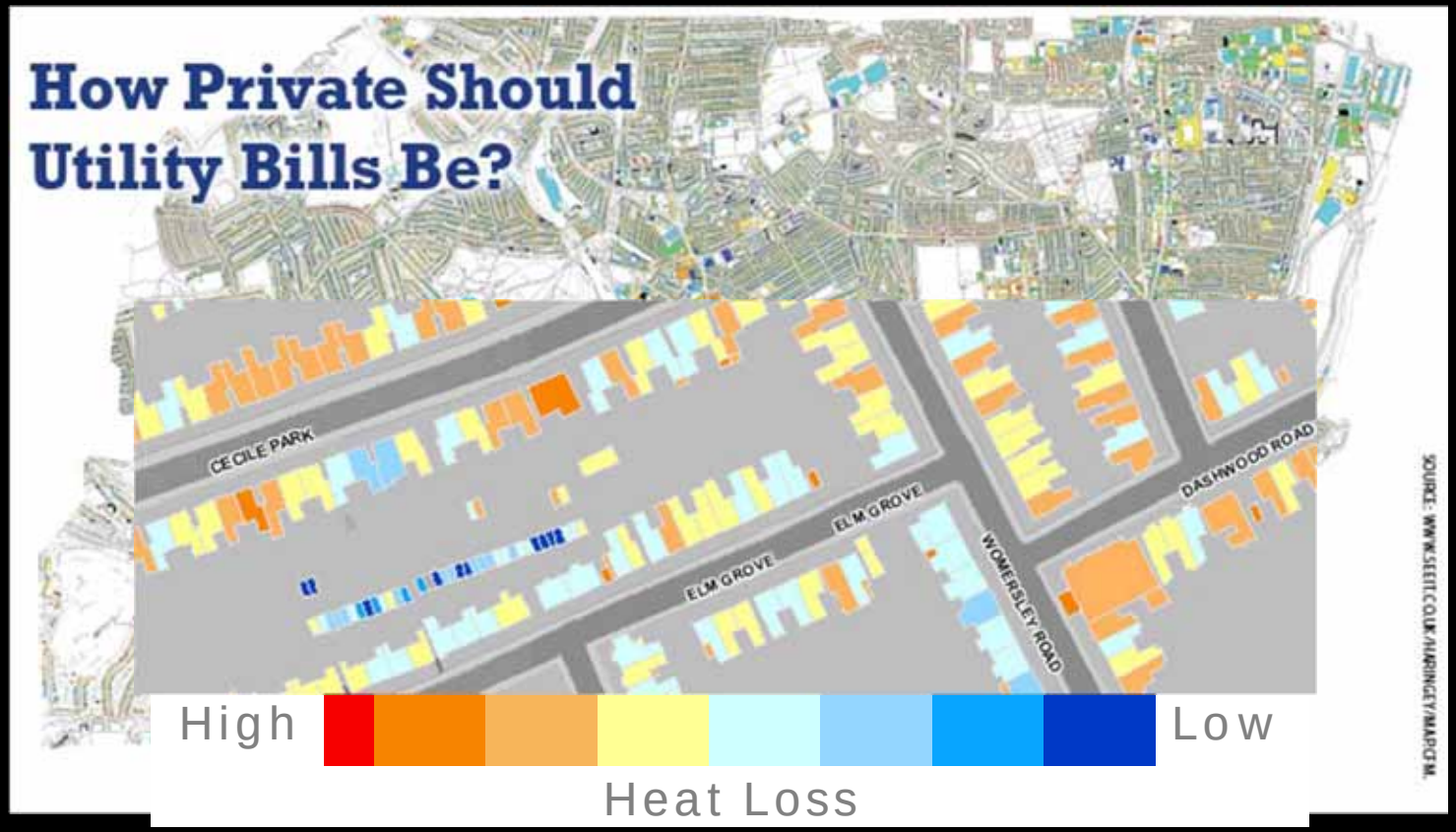
NATIONAL GREEN BUILDING STANDARD™

LEED™ FOR HOMES

ENERGY STAR HOMES

Why is Green Remodeling Important?

Will sellers will need to show energy use of every house?



Green Remodeling

Green Home Defined

A green home uses less energy, water and natural resources, creates less waste and is healthier for the people living inside compared to a standard home. It's as simple as that!

-US Green Building Council

Green Remodeling

Our Path Today:

Green Strategies

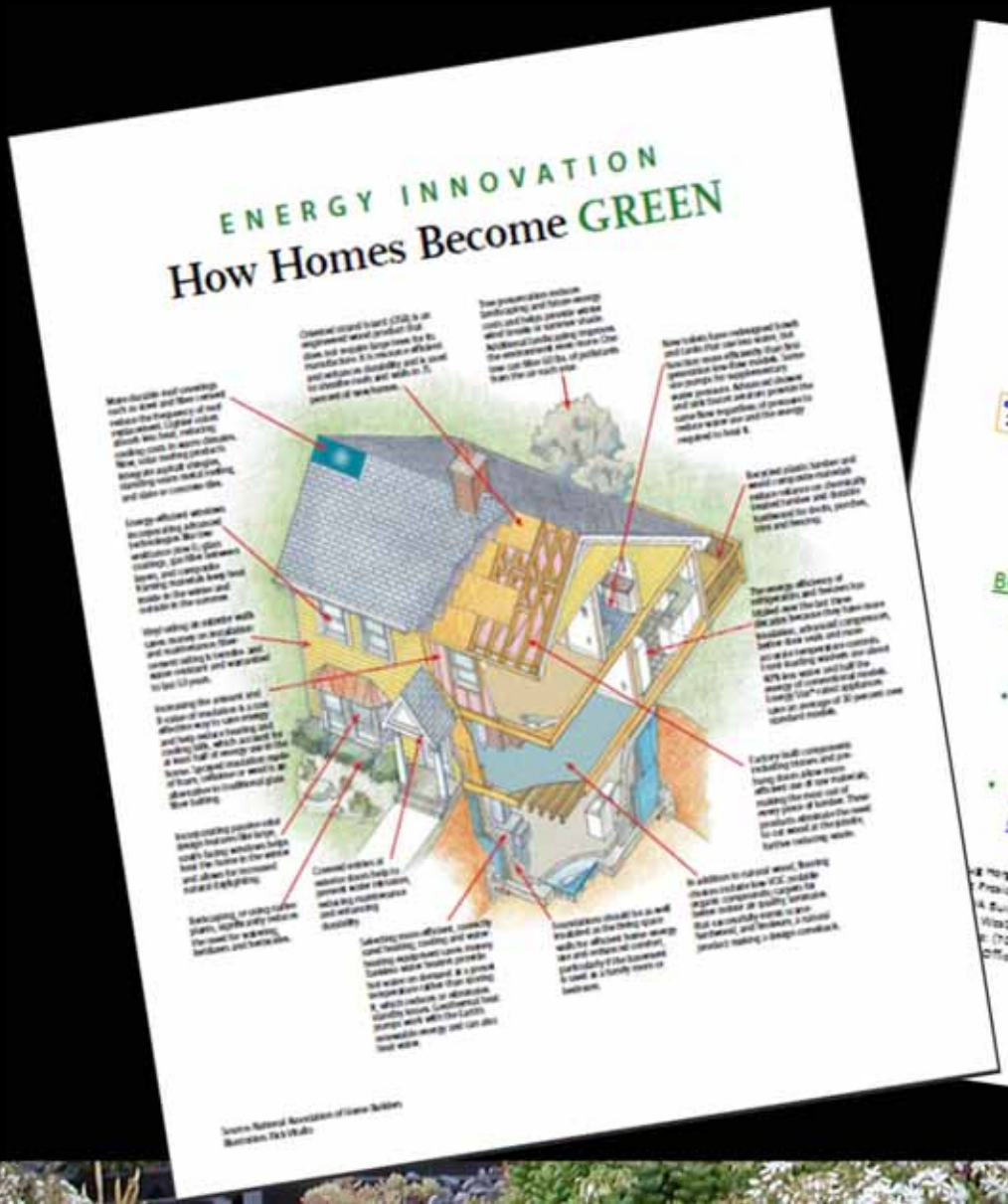
- **Energy**
- **Indoor Air**
- **Resources**

Green Guidelines

- ***ENERGY STAR***
- ***REGREEN***
- ***NGBS/LEED/EC***

www.BOWA.com/resources

Handout



ENERGY INNOVATION

How Homes Become GREEN

BOWA

Transforming Houses into Homes

Alexandria Green Building Workshop Series
Workshop 1

Green Guidelines:

- Keynote
  A great way to learn about the green strategies you can use on your renovation project
  http://www.
- National Green Building Standard
  A Green Rating System with remodeling options
  www.nahbgreen.org
- Leed for Homes
  A Green Rating System for new homes, from the US Green Building Council
- Earth Craft Virginia
  Local affiliate for the Earth Craft House Green Rating System
  www.earthcraftvirginia.org

BOWA Resources:

- Web Resources
  Links to Green Building resources, including those above
  http://www.bowa.com/resources
- Home Energy Audits
  We recommend a Home Energy Audit as the first step, and first priority, in a green renovation
  http://www.bowa.com/homeenergyaudits
- Presentations
  We love to share this knowledge, and can speak at your office or other event
  http://www.bowa.com/greenbuildingpresentations

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Green Remodeling Strategies

- Energy Efficiency
- Indoor Health
- Resources:
  - Durability
  - Materials
  - Save the Bay

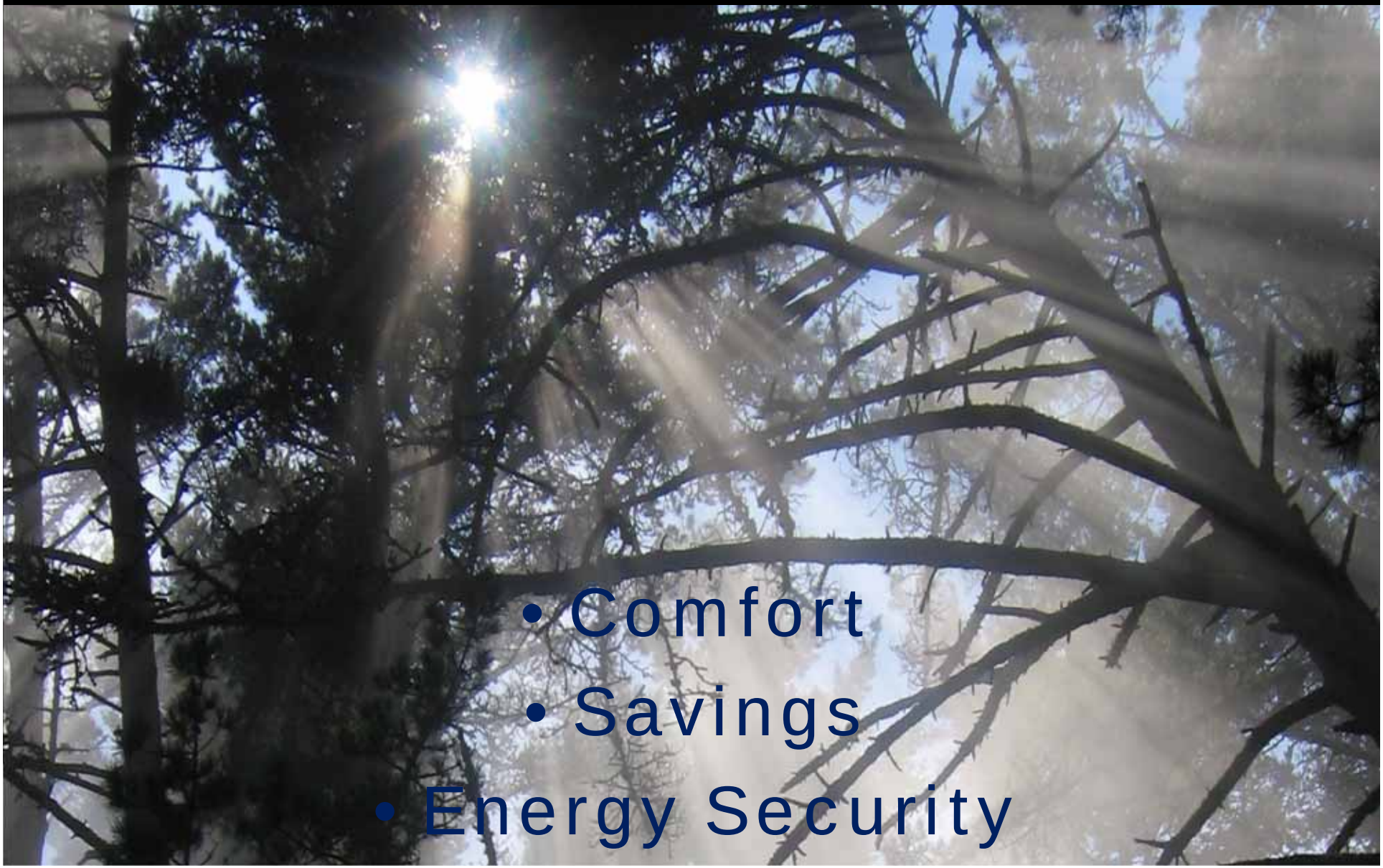
A Green Remodel, in phases

Energy: the #1 Priority

"Ongoing energy use is probably the single greatest environmental impact of a building"

—*Environmental Building News*

Not just the planet



- Comfort
- Savings
- Energy Security

Energy: a story

The Gazette

Page A-8 THE GAZETTE Wednesday, September 2, 2009

Area experts say going green doesn't have to put you in the red

JEREMY ARIAS/THE GAZETTE

Doug Horgan, a green-building specialist with D.C.-based BOWA Builders, has made numerous eco-friendly renovations to his home, including installing solar panels to

FOR MORE

- Looking to make your ho more environmentally fri just trying to save a few on your monthly energy Check out some of the p tax credits available thro Montgomery County Dep of Environmental Protect energy-efficiency incentiv
- For more information, inc links to state and federal incentives programs, visi county Web site, www.montgomerycounty /deptmpl.asp?url= /content/dep/Energy /incentives.asp#MC.

paid for themselves in the 20 years, making them a investment but, eventually,

Three Energy Strategies

First, reduce demand.

Second, use efficient systems.

Third, get clean power.

Reduce Demand

- Energy Audit, Air Sealing, & Insulation
- Pool & other “baseload”

Reduce Demand

Energy Audit: 5 steps

- Energy Bill Review
- Blower Door
- IR Camera
- Combustion Testing
- Improvements

Reduce Demand

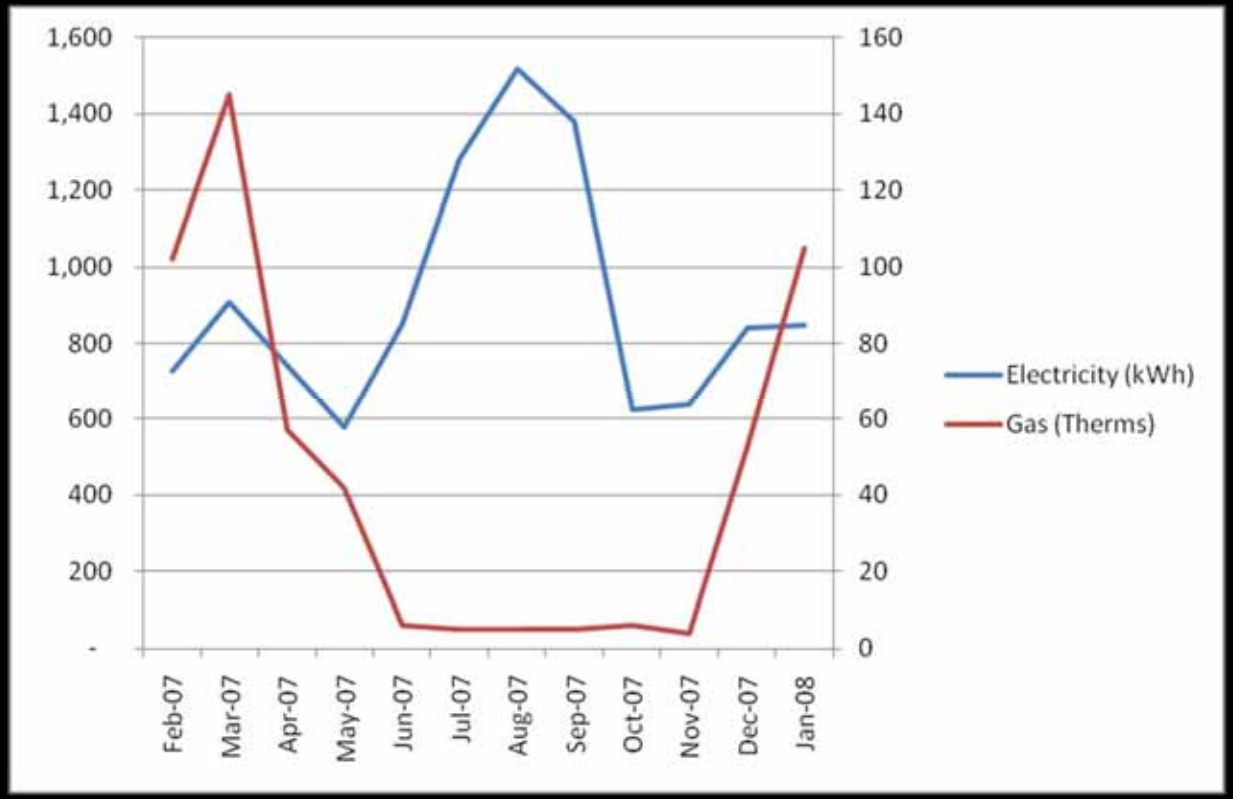
Energy Audit

Step 1: Energy Bill Review

- By Auditor
- ENERGY STAR Home Advisor
  http://www.energystar.gov/
- Do-it-yourself

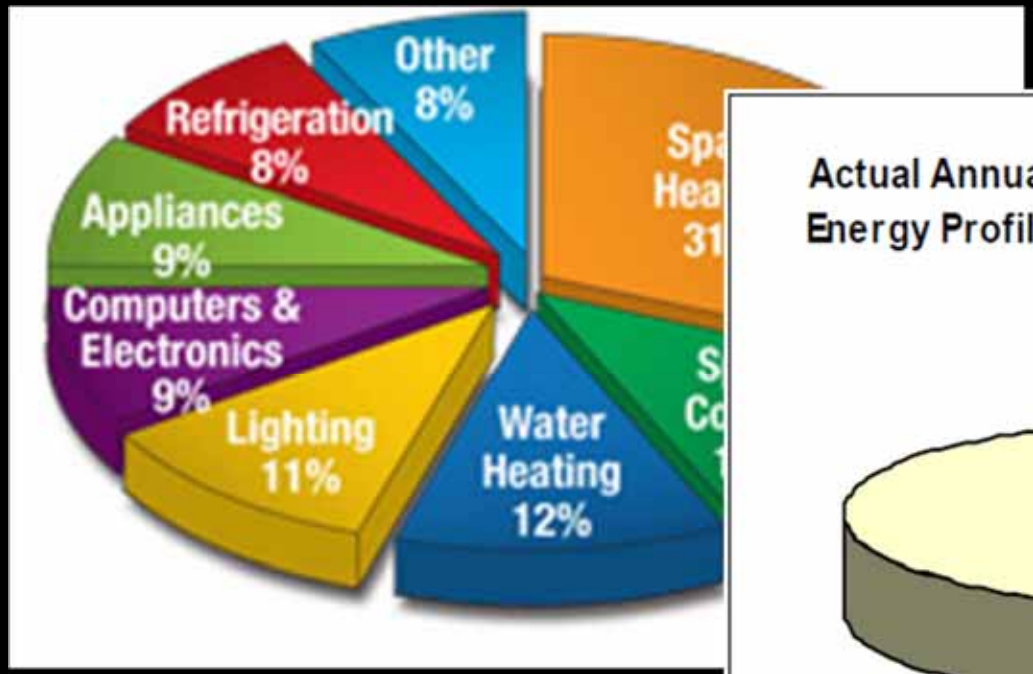
Reduce Demand

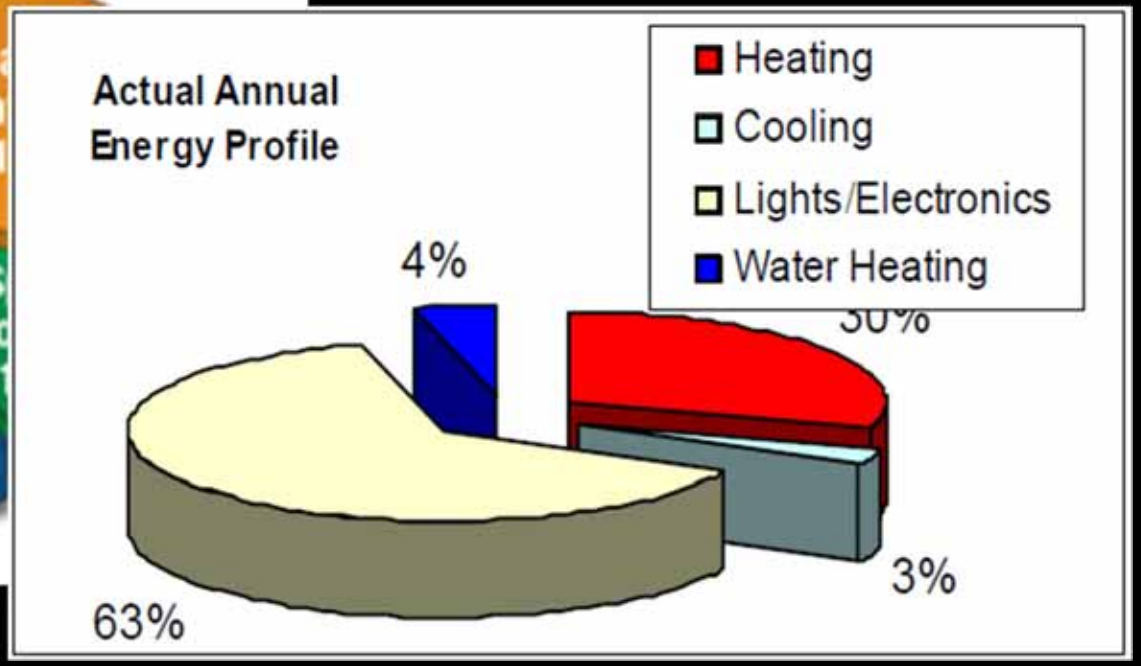
Step 1: Energy Bill Review



Reduce Demand

Energy Bill Review

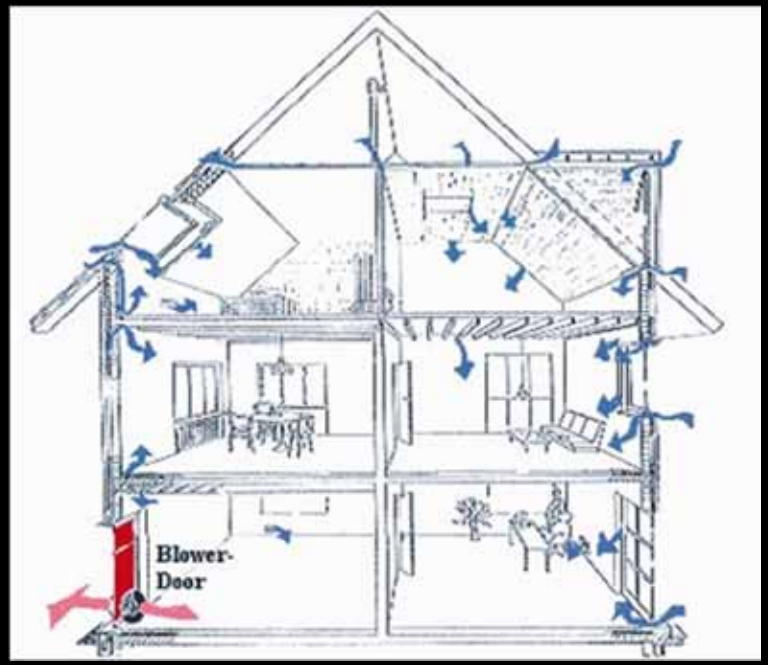




Reduce Demand

Energy Audit

Step 2: Blower Door Testing



Reduce Demand

Energy Audit Step 3: Infrared Camera

Reduce Demand

Energy Audit

Step 4: Combustion Testing

Reduce Demand

Energy Audit

Table 1 – Energy-Efficiency, Comfort, Health, and Safety Retrofits

Description	Cost	Annual Savings	Payback Period
• Seal ducts serving second floor.	$432	$145	3.0 yrs
• Build an insulated, weatherstripped box over pull-down attic stairs.	$267	$40	6.6 yrs
• Seal dropped soffit containing kitchen exhaust vent.	$250	$34	7.3 yrs
• Clean air conditioner condenser coils. Install pavers around outdoor units to prevent mud splashing on coils in the future.	$279	$37	7.5 yrs
• Seal air leaks at attic floor around plumbing, wiring, and other penetrations. Box recessed lighting fixtures and bathroom exhaust fans and seal with two-part spray foam.	$782	$101	7.7 yrs
• Address master bedroom tray ceiling. Remove ¾-inch air gap between attic insulation and ceiling drywall.	$691	$87	7.9 yrs

Reduce Demand

Energy Audit

Step 5: Improvements

- Air sealing
- Duct sealing
- Insulation

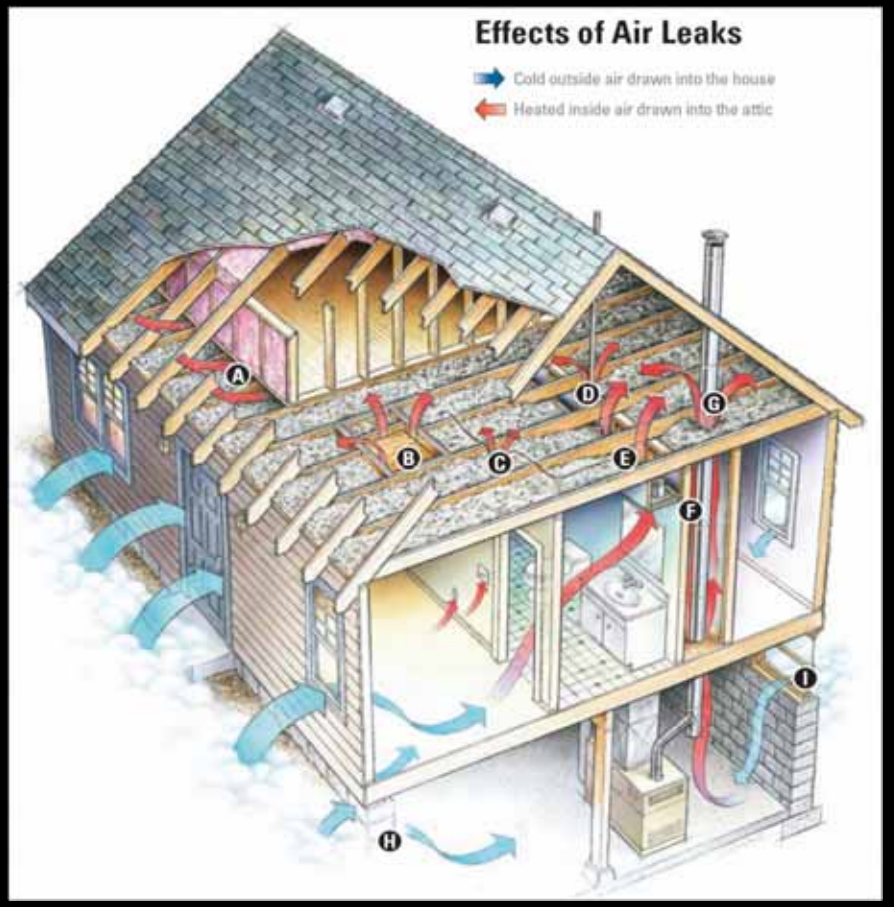
Reduce Demand

Air Sealing
“Fill a blimp every day”

Reduce Demand

Air Sealing:

- Typically 20-30% of energy loss
- Our project: 31% of heat loss



Reduce Demand

Air sealing

Reduce Demand

Air sealing

Reduce Demand

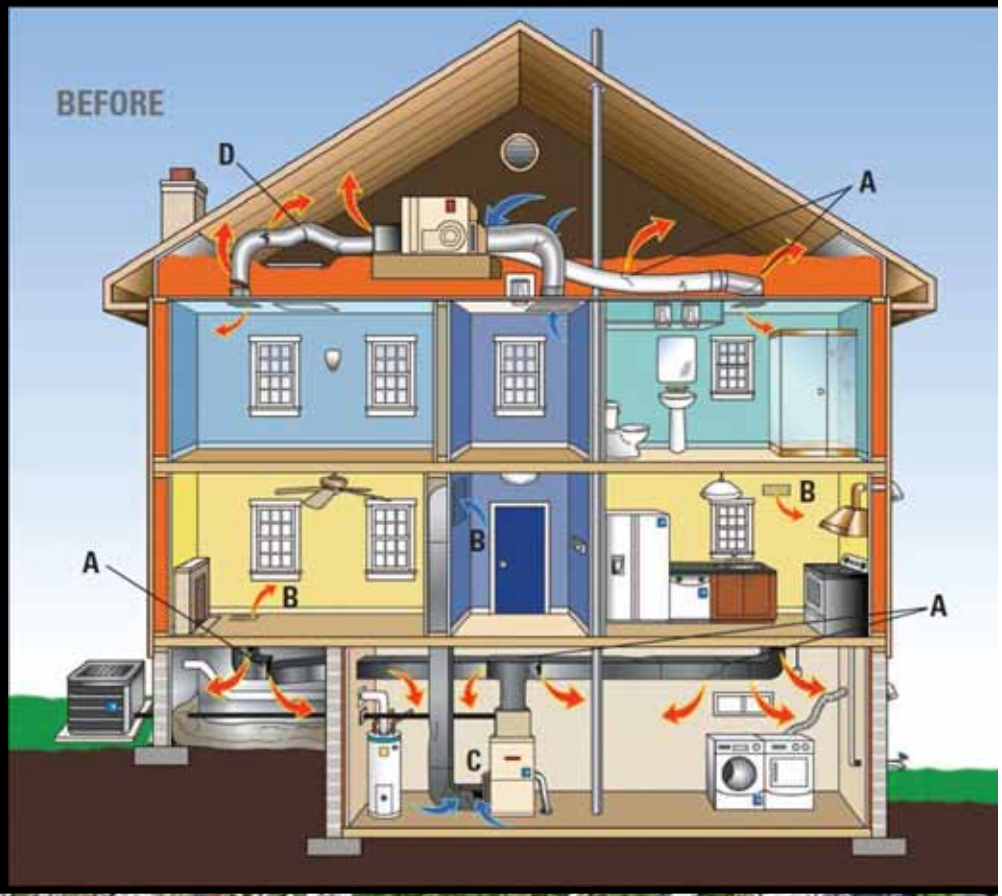
Air sealing: Recessed Lights

Reduce Demand

Duct sealing

Ductwork:

As mentioned previously, your duct-work is leaky. To be precise, under normal conditions the upstairs duct-work system loses 155 cubic feet per minute to the outside while the system is running. One of the major causes of this is a leak on the left side of the return plenum. This leak pulls attic air into the system and may be introduc-



Reduce Demand

Duct sealing

Reduce Demand

Insulation

Reduce Demand

Energy Audit & Upgrades

- Probably the single most valuable Green Remodeling strategy
- Increases comfort
- Pays for itself
- 20% improvement, $3-10K are typical

Reduce Demand: Windows

- Storm or double pane: R-2
- Low-E: R-3
- “Super”: R-5 to R-8
- Only ~15%

Reduce Demand

Pool

- Automatic cover: Could be your best investment
- Timer, efficient pumps, solar pool heater

Three Energy Strategies

First, reduce demand.

Second, use efficient systems.

Third, get clean power.

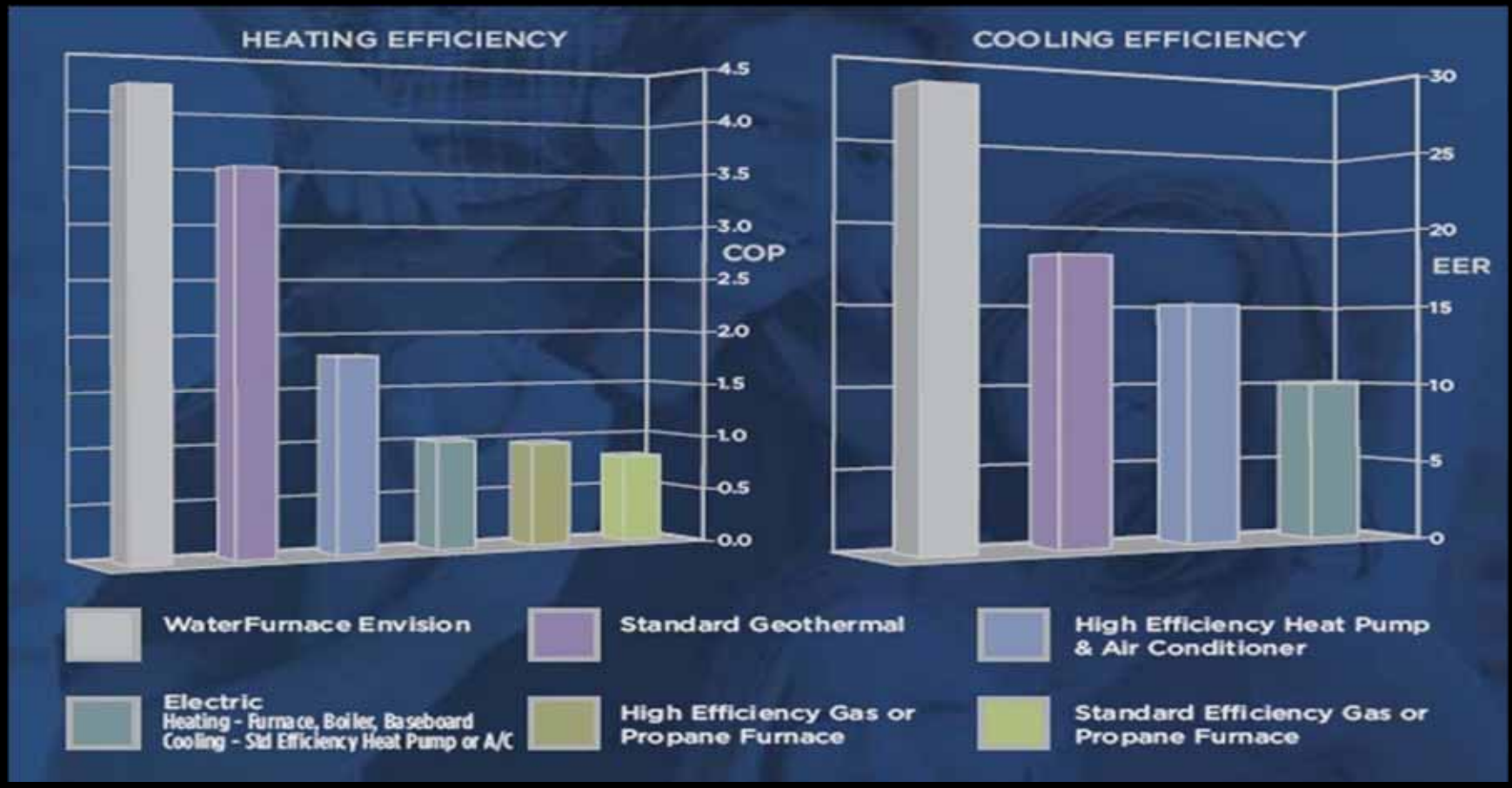
Efficient Systems

- Better Light Bulbs
- ENERGY STAR appliances
- Hot Water: distribution, tanks, tankless

Efficient Systems

- High Efficiency Gas Furnaces
- Heat Pumps
- Geothermal

- **Efficiencies, SEER, EER, COP**

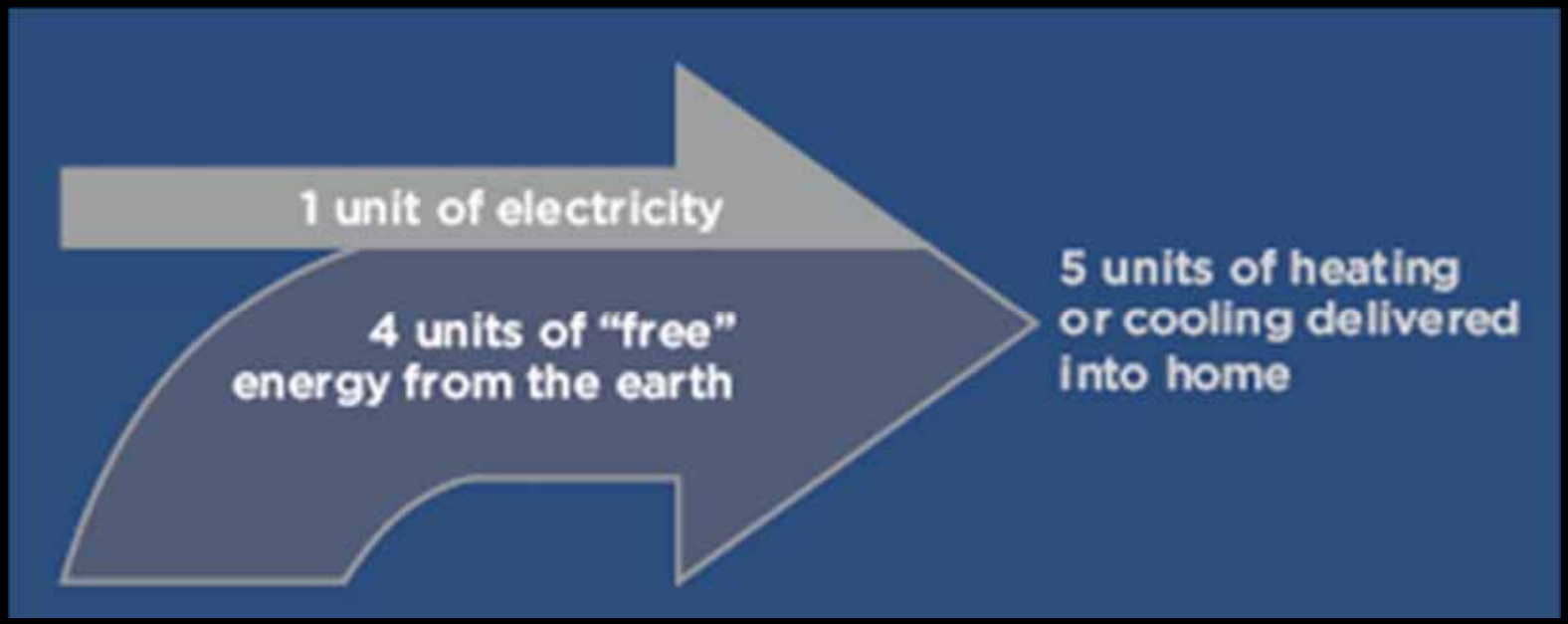


- Induced draft, 78-80% efficient

- Sealed combustion, 90% efficient

- Sealed combustion, variable-speed ECM motor, staged/modulating burners, 92%+
- Tax credit if 95%

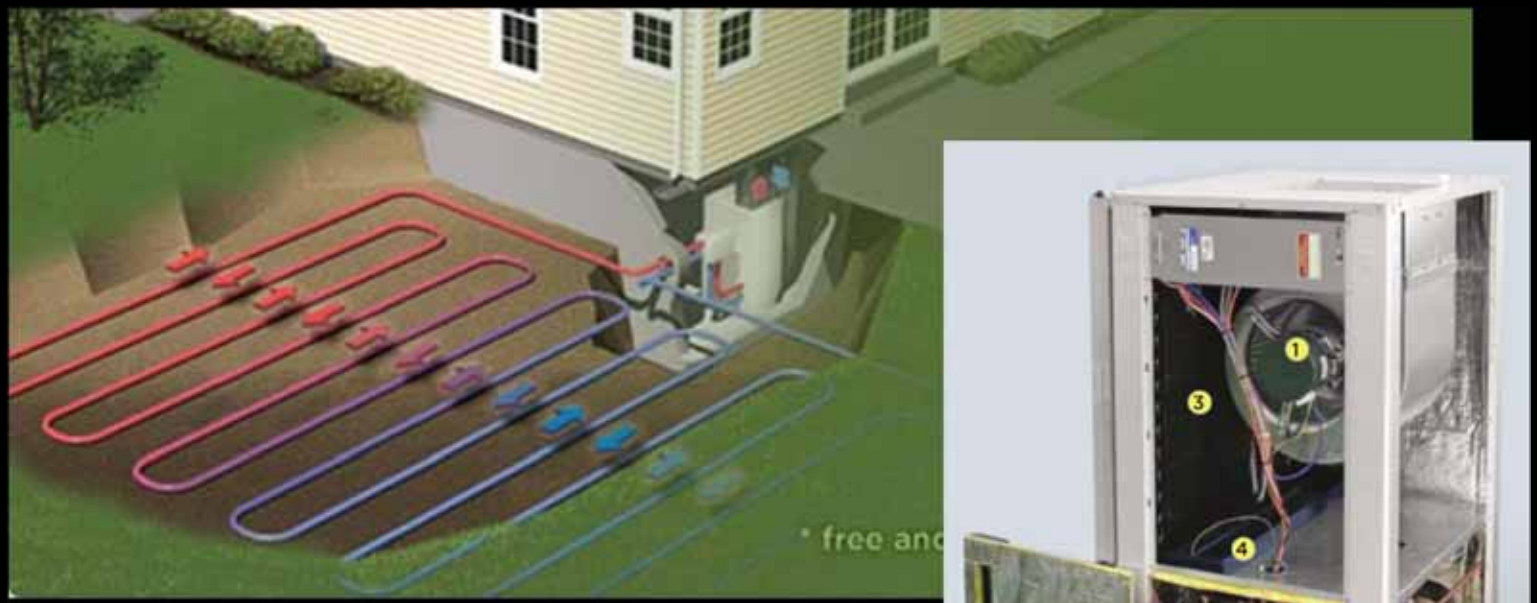
- Air-source, split system (normal)
- Air-source, ductless mini-split
- Geothermal



- Power goes to 'move' heat instead of create it.
- However, the grid wastes energy.

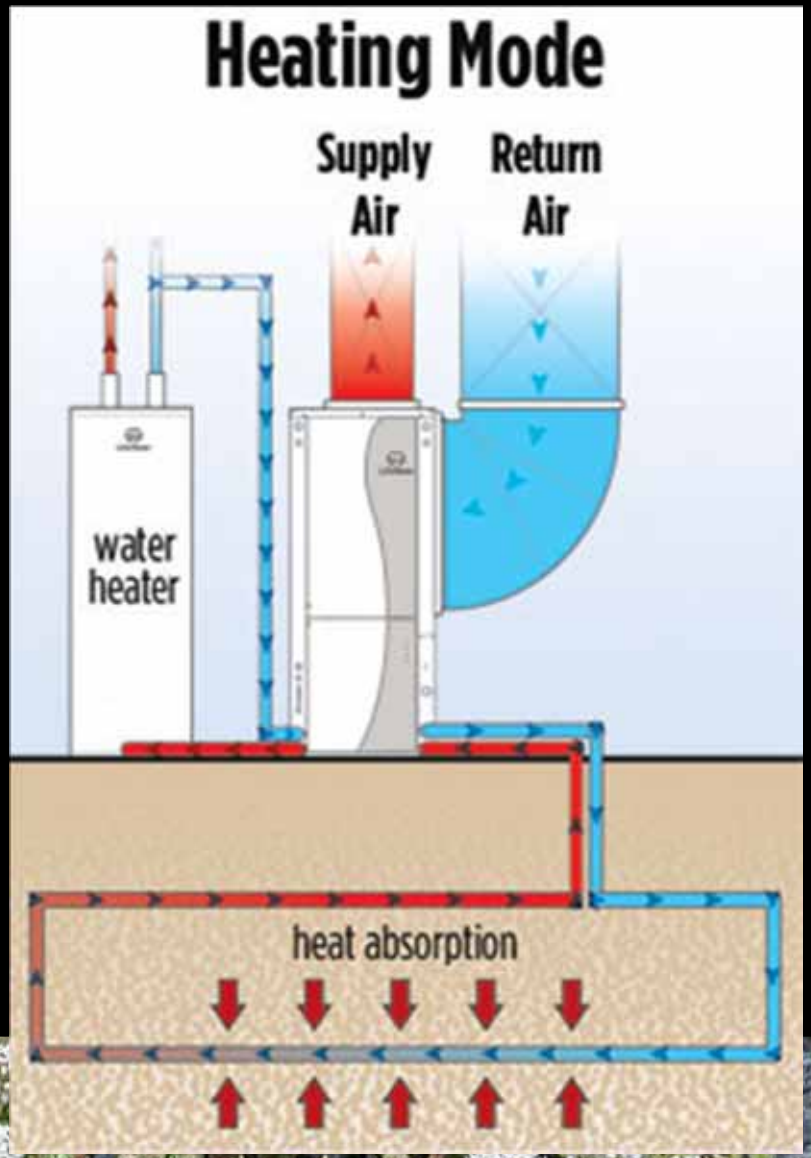
Geothermal: How it works

Heat transfer using a heat pump



Geothermal: How it works

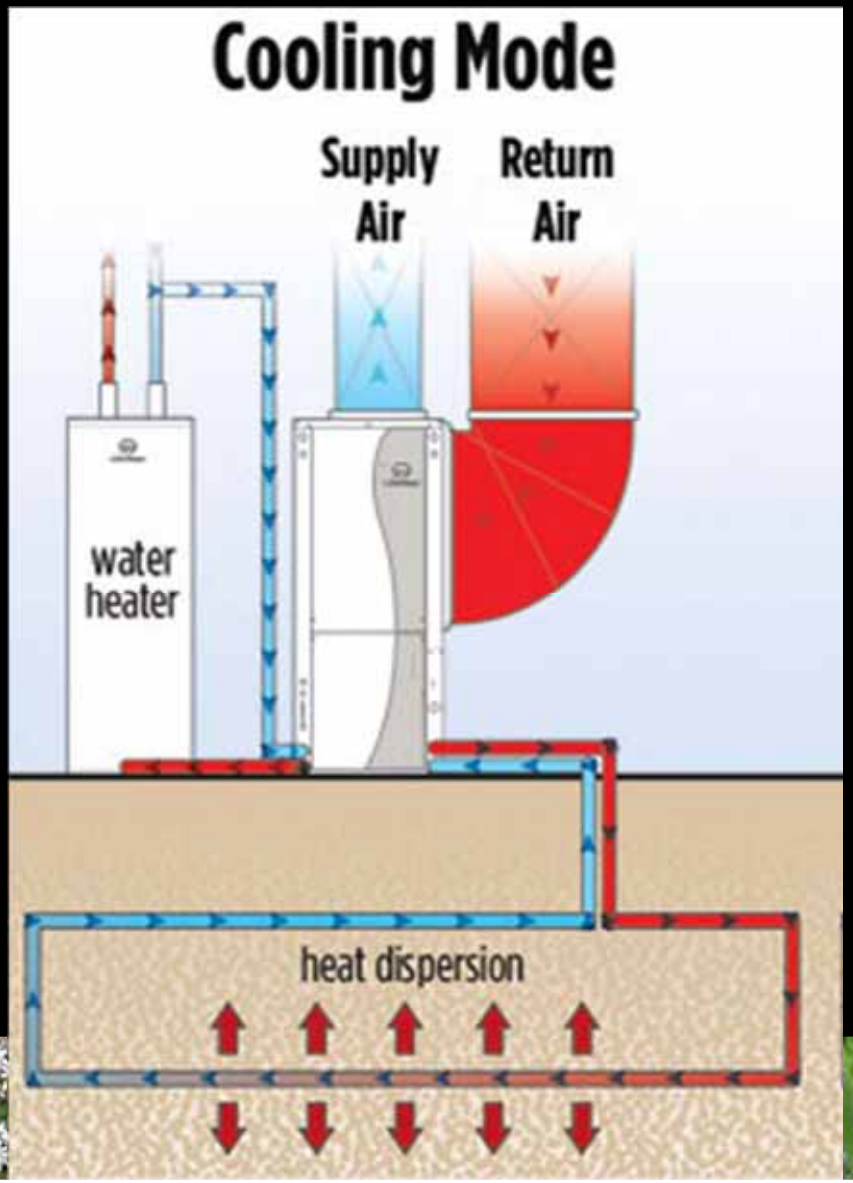
Heat transferred from 55 earth instead of 32 air



Geothermal: How it works

Cooling transferred from

55 earth instead of 95 degree air



Geothermal: Imperfect

- Source energy: 33% efficient!
- Ground is 55 sometimes, not most of the time
- Not all COP>4.5
- Pump energy

Three Energy Strategies

First, reduce demand.

Second, use efficient systems.

Third, get clean power.


More solar power hits the earth in
an hour, than humans use
in a year

Clean Power

Solar hot water, $5-10K

Clean Power

- Solar electric: PV panels

Clean Power

Solar electric

Clean Power

Wind power: local, grid

Clean Power

- Solar pool heating

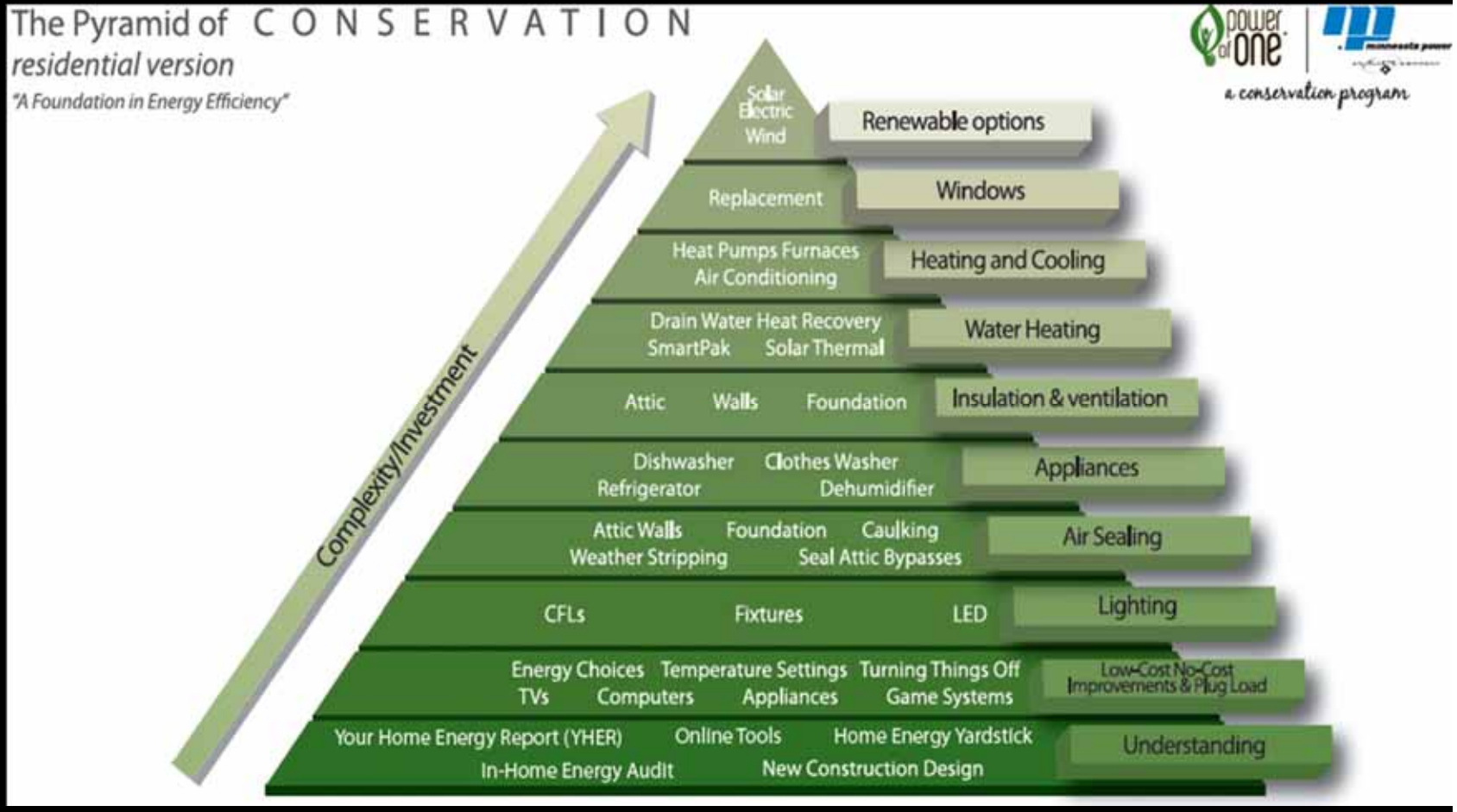
Three Energy Strategies

First, reduce demand.

Second, use efficient systems.

Third, get clean power.

Three Energy Strategies



Third, get clean power.

Green Remodeling Strategies

Indoor Air Quality

"...the risks to health may be greater due to air pollution indoors than outdoors."

—U.S. Environmental Protection Agency

Green Remodeling Strategies

Indoor Environmental Quality

Source reduction:

- Low VOC finishes
- "No Added Urea Formaldehyde" cabinetry
- Flooring

Green Remodeling Strategies

Indoor Air Quality

Source ventilation: bath, kitchen

Indoor Air Quality

- Build tight, ventilate right--
  - ERV
- Filter/UV

Green Remodeling Strategies

Indoor Air Quality

Dust Control

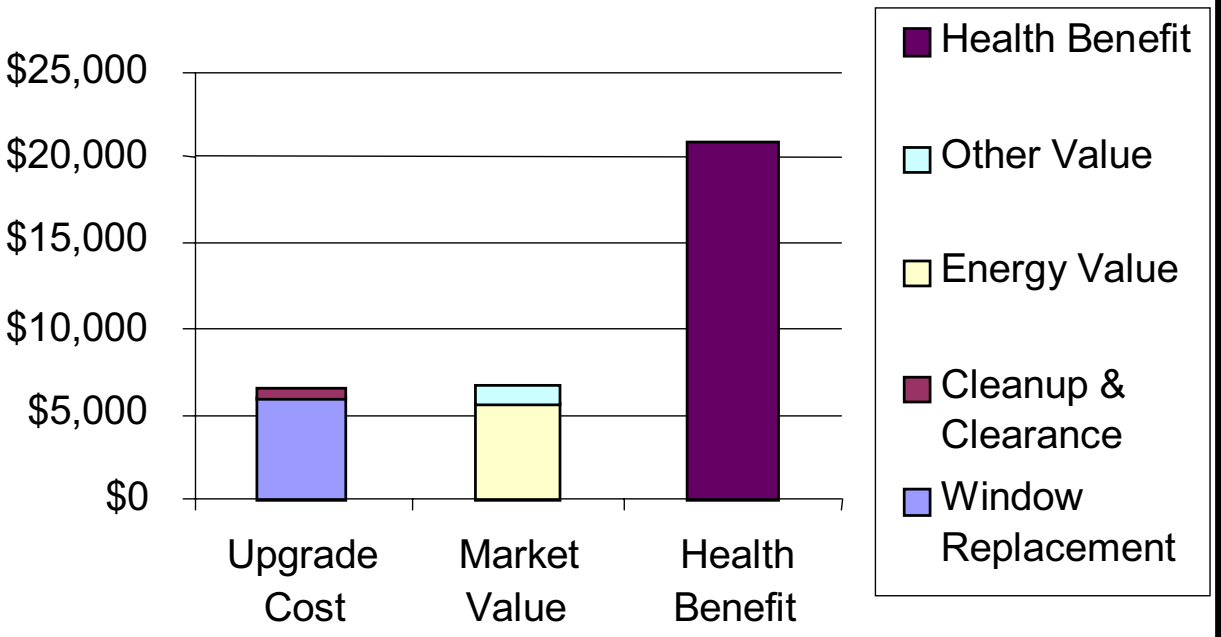
Contaminant Control

Green Remodeling Strategies

Indoor Air Quality

Lead Paint

Window Replacement Costs and Benefits



Monetary benefits of preventing childhood lead poisoning with lead-safe window replacement

Rick Nevin[a,*], David E. Jacobs[a], Michael Berg[b], Jonathan Cohen[b]

[a]*National Center for Healthy Housing, USA*
[b]*ICF International, USA*

Monetized Benefit of Lead-Safe Window Replacement

Value per IQ point (A)		$16,809	
IQ per 1 ug/dL (B)		0.52	
Value per avoided 1 ug/dL (A x B)		$8,741	
Benefit in Units with Lead Paint on Window Surfaces	**Pre-1940**	**1940-1959**	**1960-1977**
Lead dust hazard prevalence (C)	56%	43%	34%
Avoided ug/dL (D)	4.33	4.33	2.44
Average benefit per resident child (E = A x B x C x D)	$21,195	$16,275	$7,251
Benefit in Units without Lead Paint on Window Surfaces			
Lead dust hazard prevalence (F)	N.A.	17%	6%
Avoided ug/dL (G)	N.A.	2.44	1.98
Average benefit per resident child (H = A x B x F x G)	N.A.	$3,626	$1,038
Percent of single-pane window housing units with lead paint on interior window surfaces (I)	100%	40%	19%
Weighted Average Benefit per resident child (J = (E x I) + (H x (1 - I)))	**$21,195**	**$8,685**	**$2,219**
Number of Children ages 6-30 months per unit (K)	0.068	0.069	0.060
Number of Children ages children ages 6-18 months per unit (L)	0.034	0.0345	0.030
Year 1 Average Benefit per unit (J x K)	$1,441	$599	$133
Years 2-10 Average Benefits per unit (J x L)	$721	$300	$67
Present Value Benefit per unit over 10 years	**$6,847**	**$2,847**	**$632**

Green Remodeling Strategies

Indoor Air Quality

No water problems, no mold

Green Remodeling Strategies

Durability

Rain water control—

100 details


BOWA Builders, Inc.
DISCOVER THE DIFFERENCE
Window Flashing
Step 2: Sill Pan [for all windows] Continued
2.3: Apply 12" long Flex Wrap in each corner.
—6" up side, 6" along bottom.
About 3" out is the max—gets difficult to smooth.
A completed **BOWA Standard** Sill Pan:
Option 1: use Flex Wrap for the whole Sill Pan:

Green Remodeling Strategies

Durability

- Keep the water away:
  - Overhangs
  - Gutters
  - Grading

Green Remodeling Strategies

Durability

- Wood needs shelter
- Brick & Stone
- Fiber Cement
- PVC trim

Green Remodeling Strategies

Durability

Roofing material

Green Remodeling Strategies

Materials

- Reduce
- Remodel
- Deconstruct & Salvage
- Recycle
- ...then choose lower-impact materials

Green Remodeling Strategies

Materials

Deconstruct & Salvage

Green Remodeling Strategies

Materials

Lower Impact

Green Remodeling Strategies

Materials

Local

Green Remodeling Strategies

Water Conservation

- EPA Water Sense
  - –Shower Heads: 2300 gal
  - –Toilets: 4000 gal
  - –Irrigation: 30-70%

look for WaterSense Meets EPA Criteria

Green Remodeling Strategies

Save the Bay

"Scientists have found that nutrient and sediment pollution are the largest threats to water quality in the Chesapeake Bay watershed."

—Chesapeake Bay Foundation

Green Remodeling Strategies

Save the Bay

- Control stormwater
  - Minimize impervious area
  - Landscape w/swales, raingardens, filtration areas

Green Remodeling Strategies

Save the Bay

- Tree protection
- Native plants

A Green Remodel

A Green Remodel

A Green Remodel

A Green Remodel

A Green Remodel

A Green Remodel

A Green Remodel

A Green Remodel

Green Remodeling Strategies

Dozens of goals,
dozens of
strategies...

Green Remodeling

Our Path Today:

Green Strategies

- **Energy**
- **Indoor Air**
- **Resources**

Green Guidelines

- ***ENERGY STAR***
- ***REGREEN***
- ***NGBS/LEED***

Green Remodeling

Green Guidelines

Green Guidelines

ENERGY STAR

- A group of energy programs & tools
- www.energystar.gov

Green Guidelines

ENERGY STAR

Home Performance with ENERGY STAR

is for existing homes

Green Guidelines

ENERGY STAR

- Windows
- Appliances
- Lighting
- …and New Houses

REGREEN Residential Remodeling Guidelines

REGREEN
ASID & USGBC

www.regreenprogram.org

Photograph by Charles Miller, Fine Homebuilding

Green Guidelines: REGREEN

Green Guidelines: REGREEN

Integrated Pre-Design Issues

Reconfiguring Existing Space vs. an Addition

Is it really necessary to add square footage to the home?

The greenest option is usually to adapt existing space in a home to new needs instead of adding new space, so this option should be carefully evaluated before moving ahead with an addition.

Size Matters

Is the new space no bigger than needed?

Assuming that all of the possibilities to reconfigure existing space to meet the client's needs have been exhausted and an addition has been identified as the way to go, it can be tough to resist the temptation to "add big," especially since the client may only have

pipes from existing
engineer or energy
needed to achieve

Getting the Stor

**Is the new space
people, or things.**

Let's face it—most
phenomenon in an
it is not unusual for
configured as fully
with adequate stor

Green Guidelines: REGREEN

strategies

Project Scope

Includes:

- Passive solar design considerations
- Foundation
- High performance building envelope
- Advanced framing
- Integration/analysis of mechanical needs of new and existing space
- Lighting and electrical

Strategies by Building System

General Design and Construction Strategies

- Ensure durability IDP1
- Conduct a home performance audit IDP2
- Optimize energy performance during design IDP3
- Manage noise IDP4
- Design with air quality in mind IDP5
- Design for a sustainable lifestyle IDP6
- Employ universal design IDP7
- Optimize interior layout IDP8

Green Guidelines: REGREEN

General Design and Construction Strategies

1. Ensure durability

Strategy included in: All Projects

Durability applies to design, materials and construction. It means combining these in such a way that the project responds to forces that challenge its durability—water, wind, ultraviolet radiation, pests, use and abuse, natural disasters. It is also about designing a project with lasting aesthetics and utility.

Ensuring durability involves quality assurance (of design and material selection) and quality management (construction). To ensure durability, carry out a Durability Evaluation, such as that called for in the LEED for Homes program or the building assessment form listed as an appendix to this Guide.

Potential Issues:

Designing for durability is about integrating energy efficiency with indoor air quality, energy efficiency with moisture management, and materials selection with all three. In remodeling, it is also about integrating all of these for the new work with the existing home.

Related Strategies:

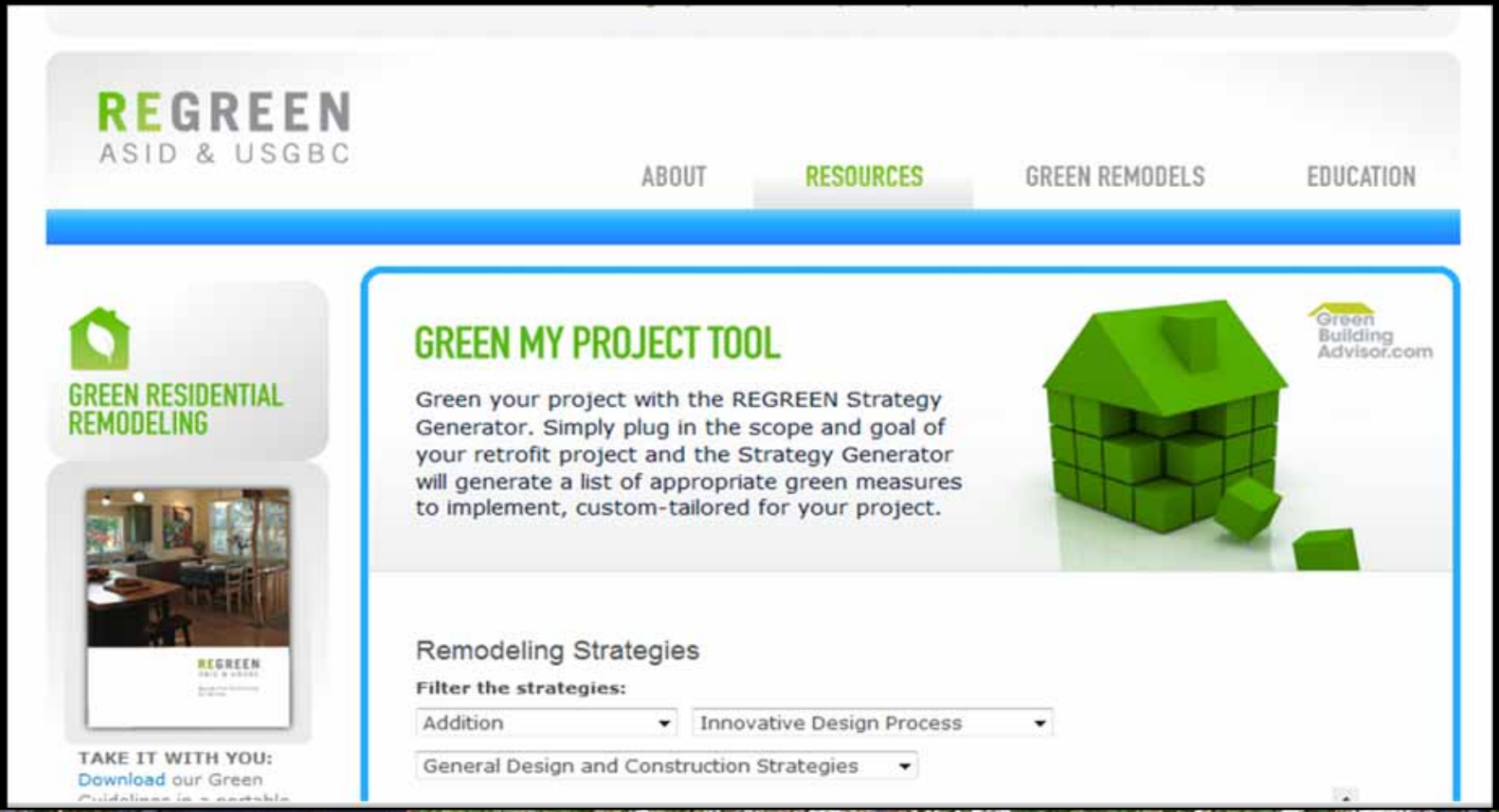
IDP5, IDP9, IDP13, IDP19, IDP24, IDP25, MR119, MR120, MR124, IEQ166, IEQ167

References/Resources:

"Read This Before You Design, Build, Or Renovate" www.buildingscienceconsulting.com/resources/mold/ (particularly the introductory section, "The Building Connection")

LEED for Homes Innovation and Design Process Credit 2 www.usgbc.org/ShowFile.aspx?DocumentID=2267

Green Guidelines: REGREEN



Green Guidelines

REGREEN Residential Remodeling Guidelines

http://www.regreenprogram.org/

Green Guidelines: NGBS

National Green Building Standard
(ICC-700)

- Developed by NAHB, USGBC, ICC

www.nahbgreen.org/ScoringTool.aspx

Green Guidelines: NGBS

Remodeling Provisions

- New spaces: meet the same standards as new green homes
- Existing house: 25% reduction in energy & water use—or meet current code

Green Guidelines: NGBS

GREEN BUILDING PRACTICES	POINTS
602.11 An enhanced foundation waterproofing is installed: **(1)** Rubberized coating, or **(2)** Drainage mat.	**4**
Addition and Renovation Note: *Section 602.11 applies to the new construction portion of additions, and to renovations that involve the demolition/reconfiguration of exterior walls, modification of the foundation wall, or an effort to improve foundation waterproofing.*	***Addition 0 Additional Points Renovation 2 Additional Points***

Green Guidelines: NGBS

Table 304
Threshold Point Ratings for Green Buildings

Green Building Categories			Performance Level Points[1,2]			
			BRONZE	SILVER	GOLD	EMERALD
1.	Chapter 5	Lot Design, Preparation, and Development	39	66	93	119
2.	Chapter 6	Resource Efficiency	45	79	113	146
3.	Chapter 7	Energy Efficiency	30	60	100	120
4.	Chapter 8	Water Efficiency	14	26	41	60
5.	Chapter 9	Indoor Environmental Quality	36	65	100	140
6.	Chapter 10	Operation, Maintenance and Building Owner Education	8	10	11	12
7.		Additional Points from any category	50	100	100	100
		Total Points:	222	406	558	697

1. In addition to the threshold number of points in each category, all mandatory provisions of each category shall be implemented.
2. For dwelling units greater than 4,000 square feet, the number of points in Category 7 (Additional Points from any category) shall be increased in accordance with Section 601.1. Total Points shall be increased by the same number of points.

Green Guidelines: LEED for Homes

- US Green Building Council
- New homes or gut remodels only

LEED™ FOR HOMES

www.usgbc.org/leed/homes

Green Guidelines: Earth Craft

- Southface Institute (Atlanta): climate appropriate
- Excellent builder training
- www.earthcraftvirginia.org

Green Guidelines

Points-based systems:

- Complex
- Help focus & balance Green efforts

Green Guidelines

- Excellent tools
- Product of thousands of hours of effort
- We’re lucky to have them!

Green Remodeling: Summary

Key Recommendations:

- Home Energy Audit
- “REGREEN” Tool
- Points-Based Tools: LEED, NGBS, Earth Craft

Green Remodeling

Green Building Workshop Series: Workshop 1

Doug Horgan
LEED AP Homes, CGP, CGR, GCP
BPI Certified Building Analyst
Vice President, BOWA
www.bowa.com

Questions?

Incentives to help you with retrofits

Local Utility programs

- Dominion
  - CFL price reductions (residential)
  - HVAC and lighting upgrade rebates (commercial)
- Washington Gas
  - Rebates for gas hot water retrofit, programmable thermostats, and home energy system check ups

Virginia programs

- ENERGY STAR and WaterSense appliance tax free holiday
- Solar energy equipment tax exemption (residential & commercial) - offered by City of Alexandria

Federal programs

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

FIND OUT MORE AT ALEXANDRIA'S GREEN BUILDING RESOURCE CENTER (http://alexandriava.gov/gbrc)

Resources from Workshop 1:
Greening Your Home, Apartment or Small Business

www.alexandriava.gov
www.amicusgreen.com
www.bowa.com
www.energystar.gov
www.buildinggreen.com
www.buildingadvisor.com
www.regreenprogram.org
www.nahbgreen.org
www.usgbc.org/leed/homes
www.earthcraftvirginia.org
www.vsbn.org

FIND OUT MORE AT ALEXANDRIA'S GREEN BUILDING RESOURCE CENTER (http://alexandriava.gov/gbrc)