



U.S. DEPARTMENT OF ENERGY
SOLAR DECATHLON

2011

How to Live in a Better Building: Home Energy Evaluations and Energy Efficiency Upgrades



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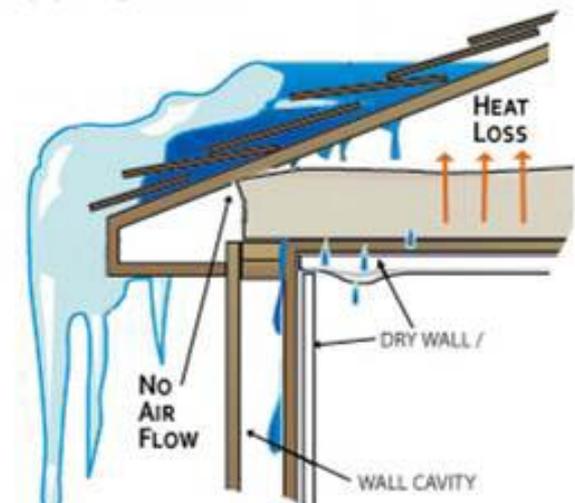
September 30, 2011

www.SolarDecathlon.gov

Did you know?

- Americans spend 90% of their time indoors.
- Households spend nearly \$2,000 per year on energy, but \$200 to \$400 of that could be wasted
- Only 20% of homes built before 1980 are well-insulated
- Homes can lose up to 60% of heated air as it travels through leaky ducts before it hits a register
- Large icicles on your roof in winter are evidence that your home is wasting energy

ROOF ICE DAM





Definitions:

 **Home energy evaluation** = energy assessment

= energy audit = energy inspection

= energy efficiency check-up

= Examination of the whole house and all its systems to identify problem areas

 **Home energy upgrade** = retrofit

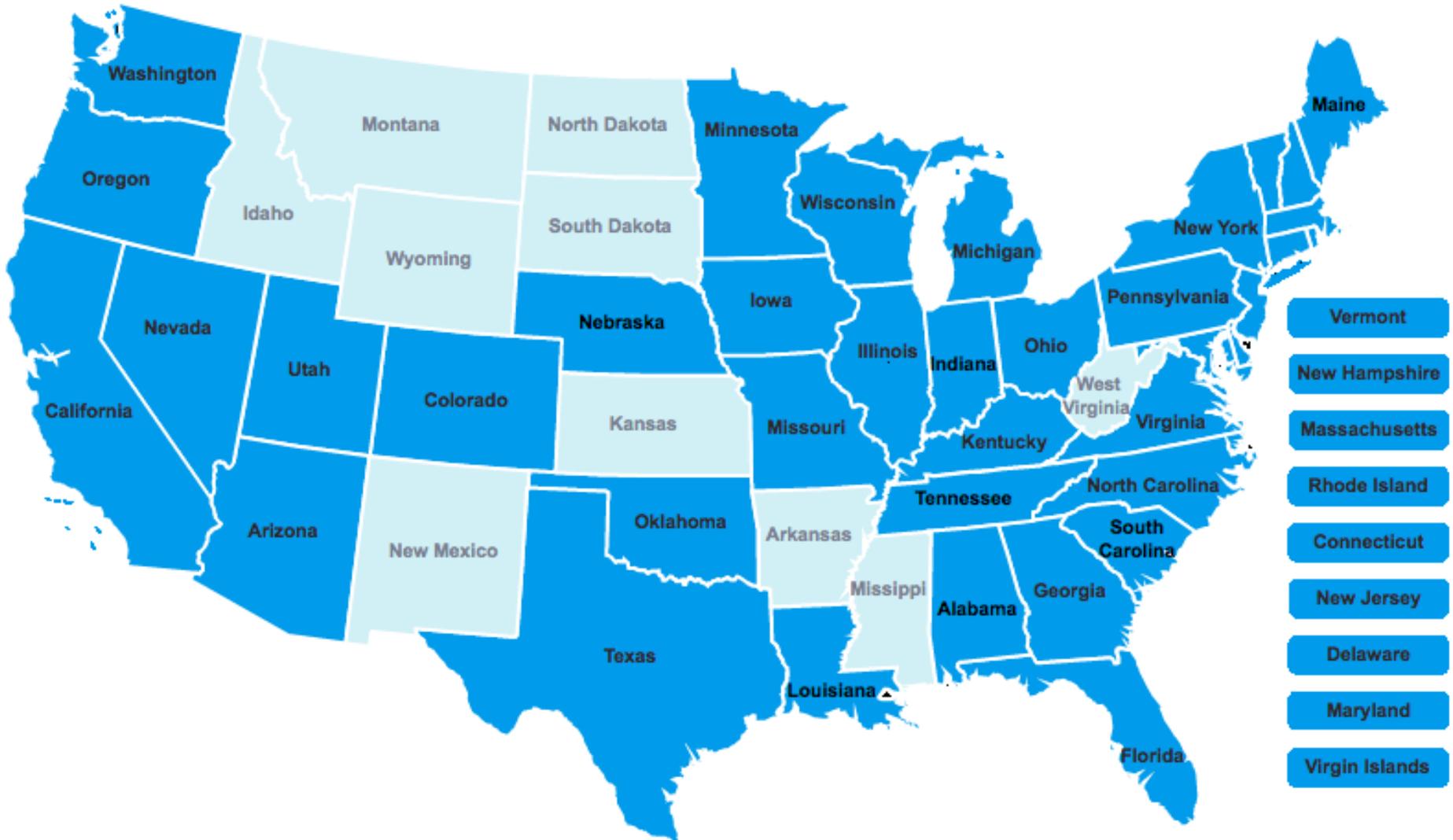
= energy efficiency improvements

= energy efficiency measures

= Work to improve the functioning of your home's systems



Preview: There Are Programs In Your Area





Better Buildings Neighborhood Program video:

Why Energy Efficiency Upgrades?



Get Inspired!

Why should YOU consider a home energy evaluation & upgrade?

- Is the room over the garage cold in the winter?
- Are there areas in your home that are drafty?
- Is the basement always cold?
- Is the room at the far end of the house often uncomfortable?
- Is your upstairs hotter than downstairs?



There is a solution!

Your home energy evaluation will:

- Identify and measure your home's energy and comfort issues
- Determine how leaky your house is and show you where the leaks are
- Figure out if your home's heating and cooling systems and appliances are operating properly
- Provide a list of recommendations for cost-effective improvements



**Infrared (IR)
camera**



Duct leakage tester



Your home energy assessment:

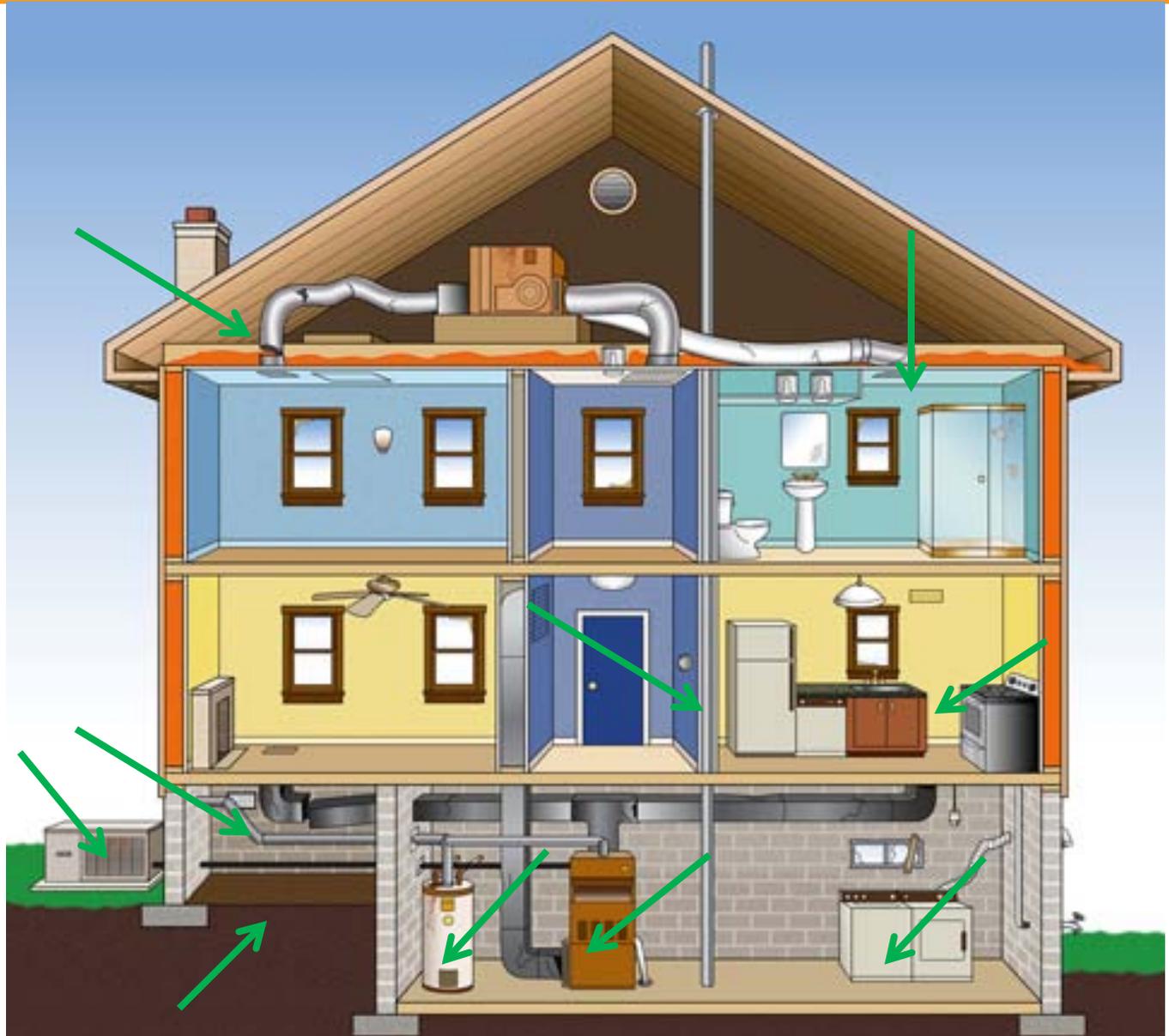


What to expect



Typical home before energy upgrades

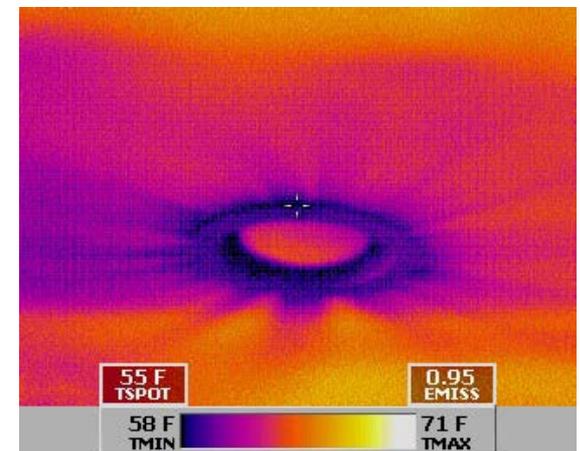
- Air leaks
- Insulation
- Duct Repair
- Old, Inefficient Furnace
- A/C
- Hot Water
- Venting
- Appliances
- Lighting



What happens next?

Your energy audit report may include:

- Air leakage (blower door) results
- Duct leakage analysis
- Infrared (IR) photos and house pictures
- Recommended home energy upgrades
- Cost effectiveness and/or payback
- List of contractors to perform your energy upgrades



Top 5: Prioritizing Home Energy Upgrades

Upgrade	Payback*
#1 Lighting	<2 yrs
#2 Duct sealing, replacement, and/or insulation	<2 yrs
#3 Whole-house air sealing	<5 yrs
#4 Insulation of the attic, crawl space, and basement	<10 yrs
#5 Equipment and appliance replacement with ENERGY STAR	<10 yrs

#1: Replace inefficient and costly lighting

- Switch to LEDs or CFLs
- ENERGY STAR-qualified LEDs last up to **25 times** longer than incandescent bulbs
- ENERGY STAR-qualified CFLs last **10 times** longer than a comparable incandescent bulb that puts out the *same* amount of light.
- ENERGY STAR lighting fixtures can save you even more!



Do it yourself !



#2: Seal ducts in the attic or crawlspace



Broken and open duct

Before

No tape or sealant at duct connections



Gray mastic seals gaps.

After

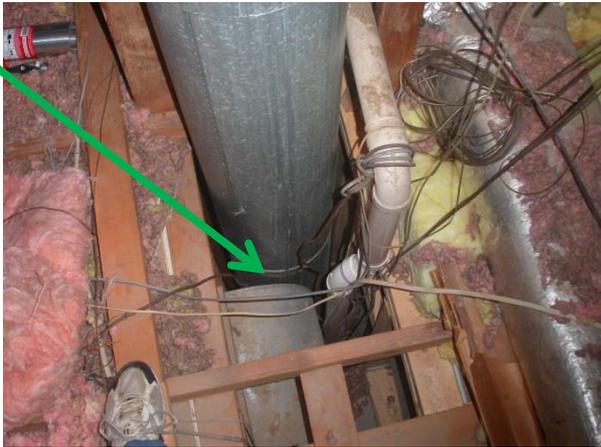
Gray mastic seals the connection





#3: Air seal your whole house

Attic floor duct

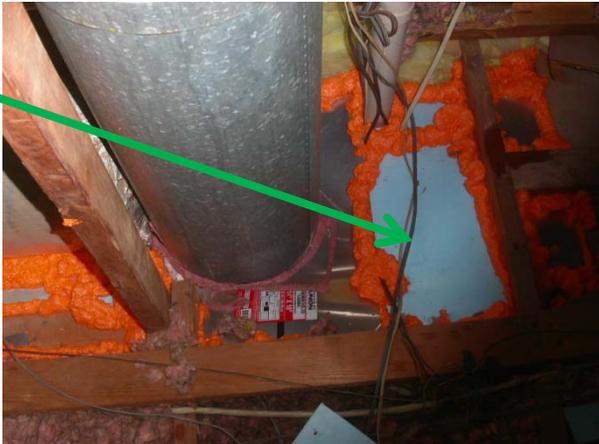


Hole in attic floor



Before

Attic floor duct



Hole in attic floor



After

Orange = Sealant (caulk, spray foam, and insulation)



#4: Insulate your attic, crawlspace, and basement **Before**



After



#5: Replace inefficient equipment

old



new





Now what?



GET STARTED!

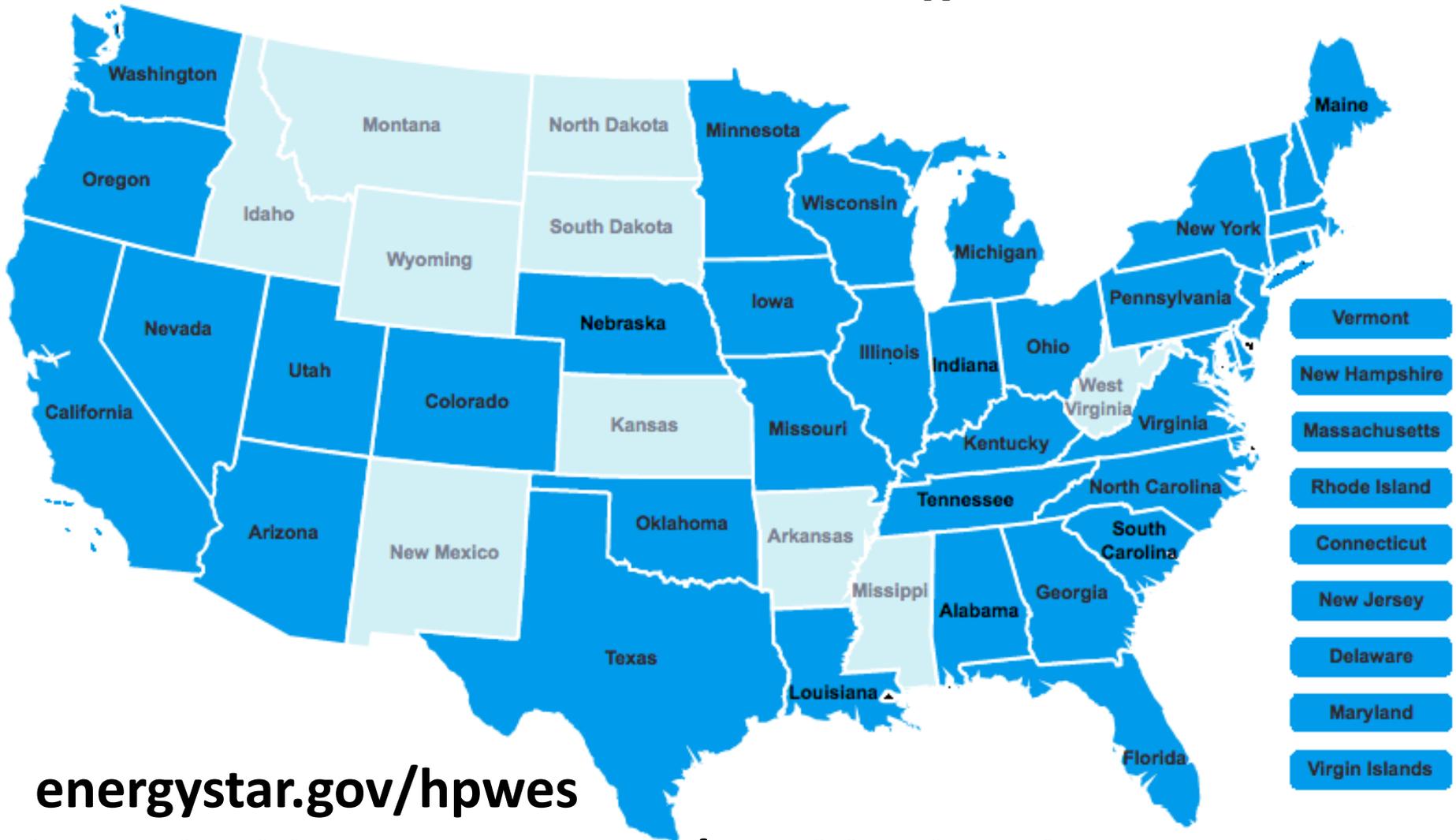
Questions to ask a home energy improvement contractor:

- How many energy improvement jobs have you done?
 - What types of improvements?
- Do you hold a building science certification?
 - Building Performance Institute (BPI)
 - Residential Energy Services Network (RESNET)
 - North American Technician Excellence (NATE)
- What type of quality assurance or inspection process do you practice?
- Do you have references from other homeowners?





Contact Your Local Program



energystar.gov/hpwes

betterbuildings.energy.gov/neighborhoods

Local energy upgrade programs

Maryland:

Home Performance with ENERGY STAR

- Energy audits (\$250- \$700)
- Rebates for upgrades up to 50%
- Quality assurance

mdhomeperformance.org

Be SMART Home

- Loans up to \$15,000
- Interest rate as low as 4.99%

mdhousing.org/besmart

STEP UP, University Park

- Additional incentives of up to \$400
- Access an Energy Coach to help

mystep-up.org

Virginia:

Home Performance with ENERGY STAR

- List of approved contractors
- Rebates for appliances and upgrades

novahomeperformance.org

LEAP, Charlottesville

- Rebates up to \$2,200
- Home energy score
- Low interest loans

leap-va.org

DC:

Sustainable Energy Utility

- Basic retrofit for \$100 in some areas

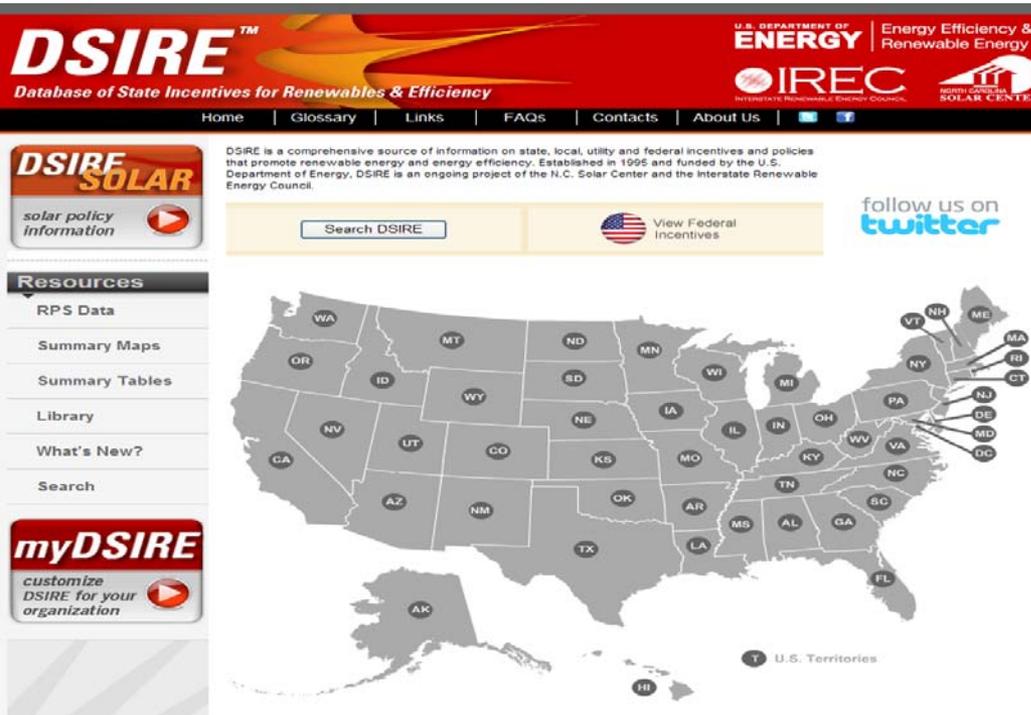
dcseu.com

DDOE

- Free home energy audit & rating

ddoe.dc.gov

Rebates & incentives: dsireusa.org



DSIRE™
Database of State Incentives for Renewables & Efficiency

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

IREC | INTERSTATE RENEWABLE ENERGY COUNCIL

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DSIRE is a comprehensive source of information on state, local, utility and federal incentives and policies that promote renewable energy and energy efficiency. Established in 1995 and funded by the U.S. Department of Energy, DSIRE is an ongoing project of the N.C. Solar Center and the Interstate Renewable Energy Council.

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Resources

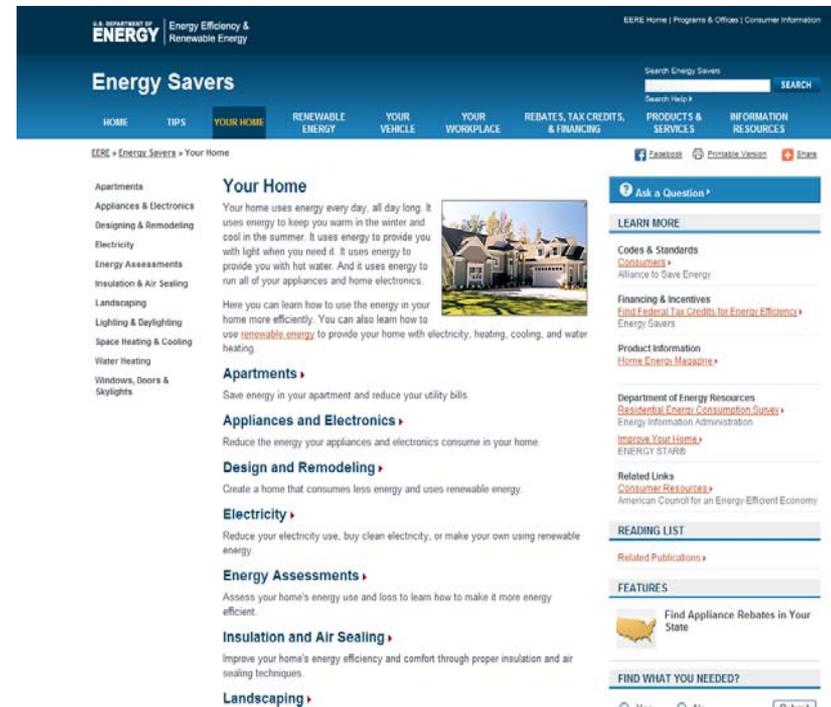
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U.S. Territories

Energy tips: energysavers.gov



U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

EEER Home | Programs & Offices | Consumer Information

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Energy Savers

HOME | TIPS | **YOUR HOME** | RENEWABLE ENERGY | YOUR VEHICLE | YOUR WORKPLACE | REBATES, TAX CREDITS, & FINANCING | PRODUCTS & SERVICES | INFORMATION RESOURCES

EEER > **Energy Savers** > Your Home

Apartment

Appliances & Electronics

Designing & Remodeling

Electricity

Energy Assessments

Insulation & Air Sealing

Landscaping

Lighting & Daylighting

Space Heating & Cooling

Water Heating

Windows, Doors & Skylights

Your Home

Your home uses energy every day, all day long. It uses energy to keep you warm in the winter and cool in the summer. It uses energy to provide you with light when you need it. It uses energy to provide you with hot water. And it uses energy to run all of your appliances and home electronics.

Here you can learn how to use the energy in your home more efficiently. You can also learn how to use **renewable energy** to provide your home with electricity, heating, cooling, and water heating.

Apartment

Save energy in your apartment and reduce your utility bills.

Appliances and Electronics

Reduce the energy your appliances and electronics consume in your home.

Design and Remodeling

Create a home that consumes less energy and uses renewable energy.

Electricity

Reduce your electricity use, buy clean electricity, or make your own using renewable energy.

Energy Assessments

Assess your home's energy use and loss to learn how to make it more energy efficient.

Insulation and Air Sealing

Improve your home's energy efficiency and comfort through proper insulation and air sealing techniques.

Landscaping

Ask a Question

LEARN MORE

Codes & Standards

Coastal

Alliance to Save Energy

Financing & Incentives

Find Federal Tax Credits for Energy Efficiency

Energy Savers

Product Information

Home Energy Magazine

Department of Energy Resources

Residential Energy Consumption Survey

Energy Information Administration

Improve Your Home

ENERGY STAR

Related Links

Consumer Resources

American Council for an Energy-Efficient Economy

READING LIST

Related Publications

FEATURES

Find Appliance Rebates in Your State

FIND WHAT YOU NEEDED?



Thank you!

Danielle Sass Byrnett

U.S. Department of Energy

Better Buildings Neighborhood Program

To view this presentation online, visit:

www.SolarDecathlon.gov



Resources I

- **Solar Decathlon**
www.SolarDecathlon.gov
- **YouTube Energy 101: Energy assessment**
www.youtube.com/watch?v=YolBP0-vkBU
- **Home Performance with ENERGY STAR (National)**
www.energystar.gov/hpwes
- **Maryland Home Performance with ENERGY STAR**
www.mdhomeperformance.org
- **Northern Virginia Home Performance**
www.novahomeperformance.com
- **DC Sustainable Energy Utility**
dcseu.org



Resources II

- **U.S. Department of Energy: Energy Savers Website**
Various resources for homeowners & apartment dwellers
www.energysavers.gov
- **U.S. Department of Energy: Better Buildings Program**
www.betterbuildings.energy.gov/neighborhoods
- **Database of State Incentives for Renewables and Efficiency**
www.dsireusa.org