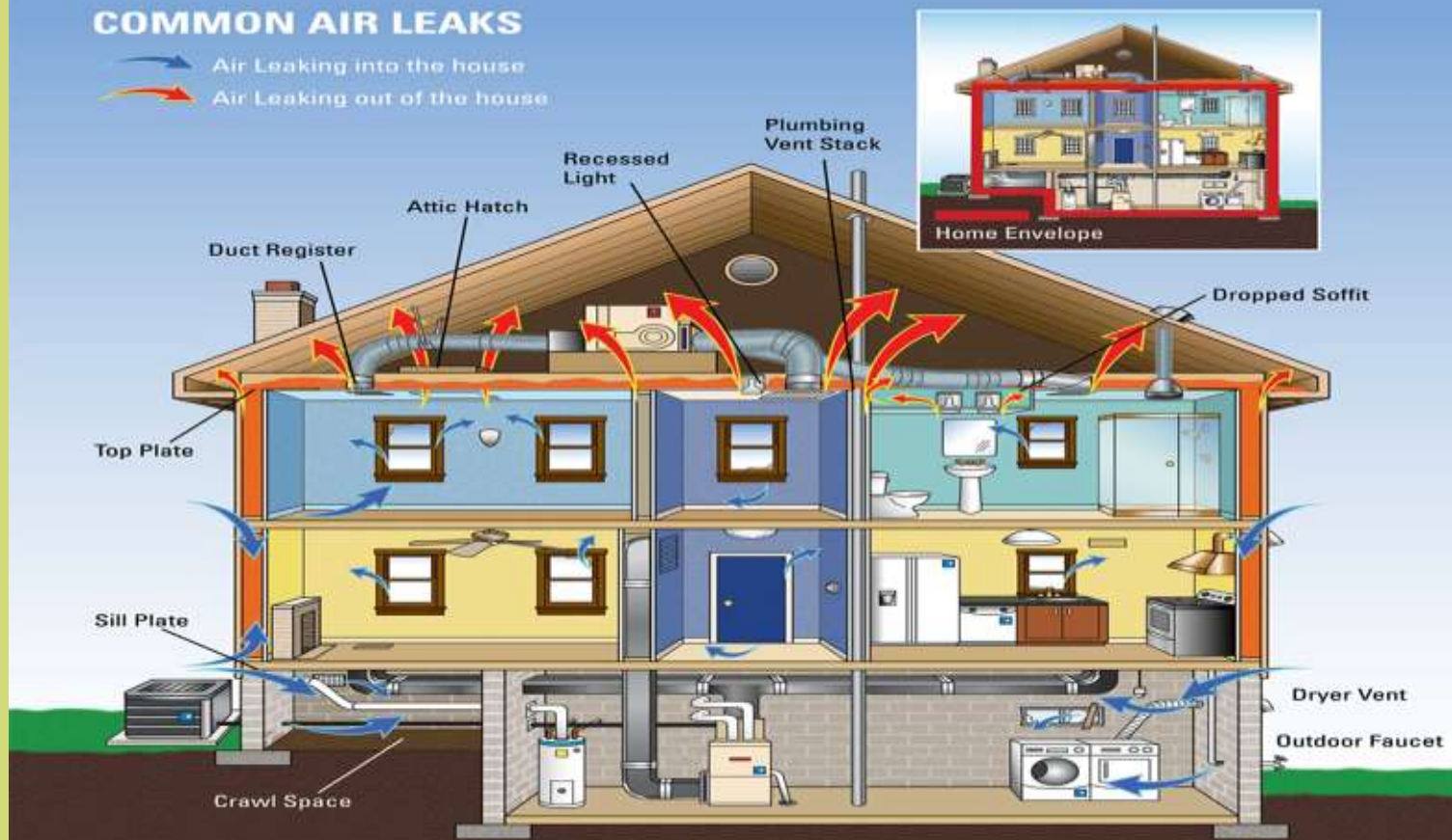


COMMON AIR LEAKS

-  Air Leaking into the house
-  Air Leaking out of the house



Source: U.S. EPA

ENERGY EFFICIENCY WORKSHOPS

John Root, President, The Root Cellar
Renewable Energy and Energy Efficiency Consulting and Sales

SPONSORS

Iowa Power Fund Community Grants Program
Scott County GREEN
(Guidance for Residential Energy Efficiency Neighborhoods)
Iowa Office of Energy Independence
Quad City Home Builders and Remodelers Association
MidAmerican Energy
Iowa Center on Sustainable Communities
Advanced Technology Environmental and Energy Center
Eastern Iowa Community College District
Nahant Marsh Education Center
City of Davenport

Thank you for believing in the power of education to save our environment.

CONTENTS

1. Energy Audits
2. Roofing and Siding
3. Insulation
4. Windows and Doors
5. Fireplaces
6. HVAC
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8. Lighting
9. Appliances
10. Smart Metering
11. Weatherization and Homeowner Incentives
12. Contractor Certifications
13. Tax Assessment Procedures
14. Code Compliance and Enforcement
15. Licensing and Fraud Prevention
16. Property Values and Enhancements

ENERGY AUDITS

For a free home energy audit, contact MidAmerican Energy and tell them you participated in this workshop.



Infrared photo of a house.

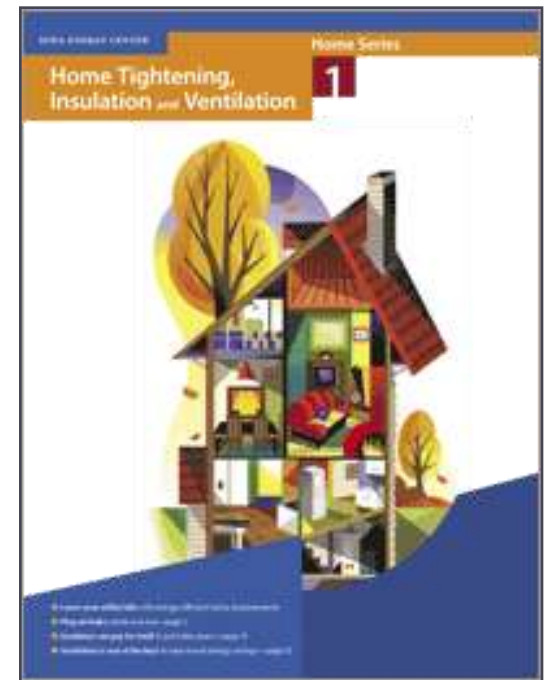
ENERGY AUDITORS TRACK ENERGY LOSS THROUGHOUT THE HOUSE.

- Doors
- Windows
- Outlets
- Pipes
- Foundation
- Fireplace
- Vents



For more information get your free copy of the Iowa Energy Center (IEC), *Home Series 1: Home Tightening, Insulation, and Ventilation* booklet at www.energy.iastate.edu/homeseries/.

- ① Energy loss occurs through:
 1. **Infiltration** – direct passage from inside to outside air through cracks and leaks in the structure
 2. **Convection** – drafts, air thermals, water currents
 3. **Radiation** – transfer across space like sunlight or heat from a stove felt across a cold room



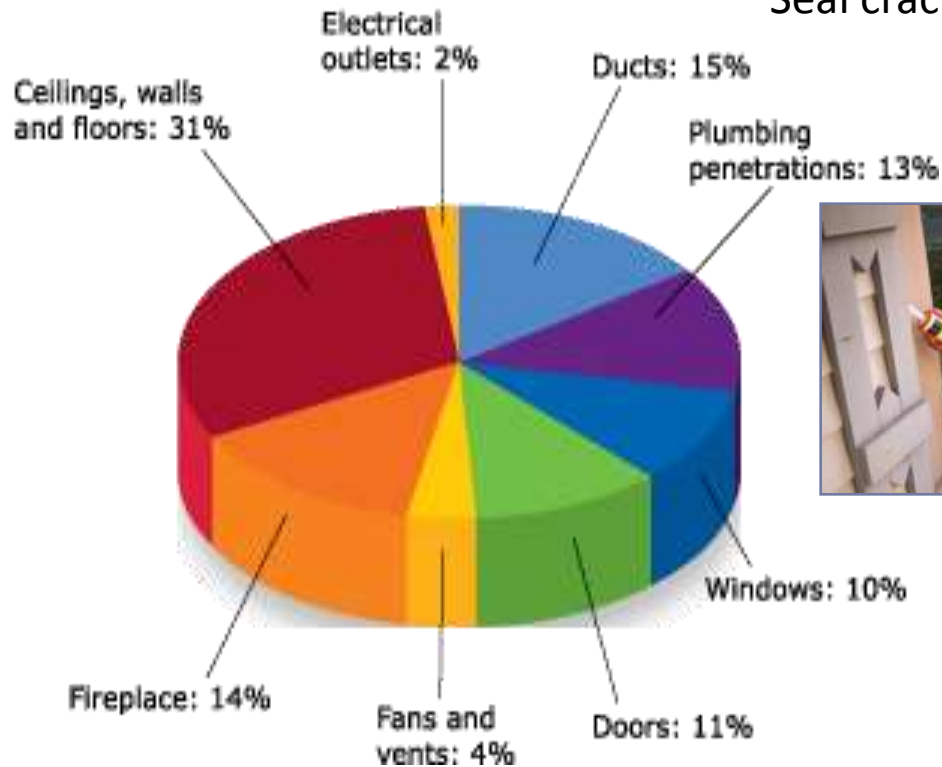
HEAT LOSS

Infiltration is the direct passage from inside to outside air through cracks and leaks in the structure.

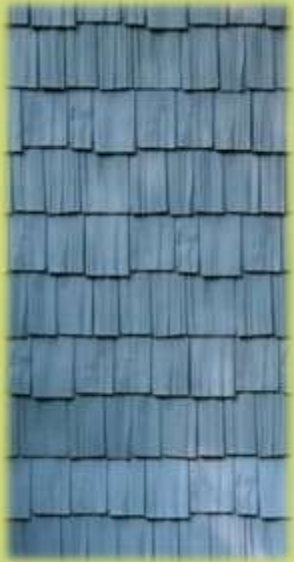
Sources of air leaks in a typical home

1 hour of leakage = one houseful of air

Seal cracks and leaks with caulk.



ROOFING AND SIDING



- ⊙ Seal all seams and gaps.
- ⊙ Replace missing or damaged shingles.
- ⊙ Blow insulation inside walls and sealed spaces.

Can a house be too tight?

INSULATION

Match the insulation sample with its R-value rating per inch.

- | | |
|---------------------|----------|
| ⊙ Cement block | ⊙ R-0.30 |
| ⊙ Asphalt shingles | ⊙ R-0.44 |
| ⊙ Gypsum | ⊙ R-0.60 |
| ⊙ Wood | ⊙ R-0.71 |
| ⊙ Single glass pane | ⊙ R-0.90 |
| ⊙ Fiberglass batts | ⊙ R-2.50 |
| ⊙ Cellulose | ⊙ R-3.33 |
| ⊙ Insulating foam | ⊙ R-5.00 |



OTHER SOLUTIONS

- ⊙ Replace old weather-stripping.
- ⊙ Place draft enders behind switch plates.
- ⊙ Repair exhaust vent covers.
- ⊙ Insulate around attic doors and canned lighting fixtures.
- ⊙ Keep fireplace dampers closed and install glass doors.
- ⊙ Insulate pipes and water heater.
- ⊙ Insulate heating and cooling ductwork.



WINDOWS AND DOORS

Convection is caused by drafts, air thermals, and water currents. Heat escapes as it moves through cooler areas.

- ⊙ Replace windows and glass doors.
- ⊙ Install low-E argon filled windows.
- ⊙ Install pop-in window insulation.
- ⊙ Install window quilt.
- ⊙ Close curtains at night.



FIREPLACES

Radiation is the transfer of heat across space like sunlight or heat from a stove felt across a cold room.

- ⊙ Keep fireplace dampers closed when not in use.
- ⊙ Install glass doors.
- ⊙ Use a wood burning stove instead.

8% of the heat can go up the chimney.



HEATING, VENTILATION, AND AIR CONDITIONING

Upgrade your heating, ventilation, and air conditioning, otherwise known as HVAC, systems saves money and energy.

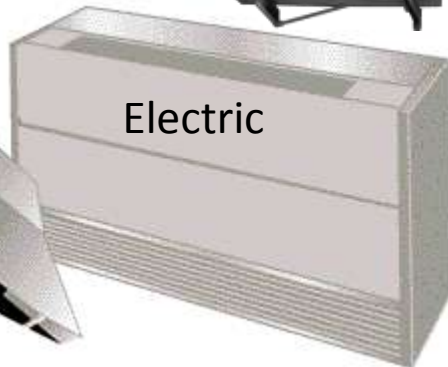
Hot Water Heat



Vents



Electric



Forced Air
Oil and Gas



For more information get your free copy of the Iowa Energy Center (IEC), *Home Series 2: Home Heating and Cooling* booklet at www.energy.iastate.edu/homeseries/.

CONSERVE HEAT

- ⦿ Install an automatic thermostat.
 - ⦿ Set thermostat at no more than 68° for heat and no less than 85° for cooling.
- ⦿ Service furnace yearly.
- ⦿ Change filter as often as indicated by manufacturer.
- ⦿ Insulate air ducts in unheated spaces.
 - ⦿ Duct leaks account for 13% of energy use.
 - ⦿ Tape seams with mastic, putty, or adhesive foil.
- ⦿ Keep radiators and vents clean and not blocked.

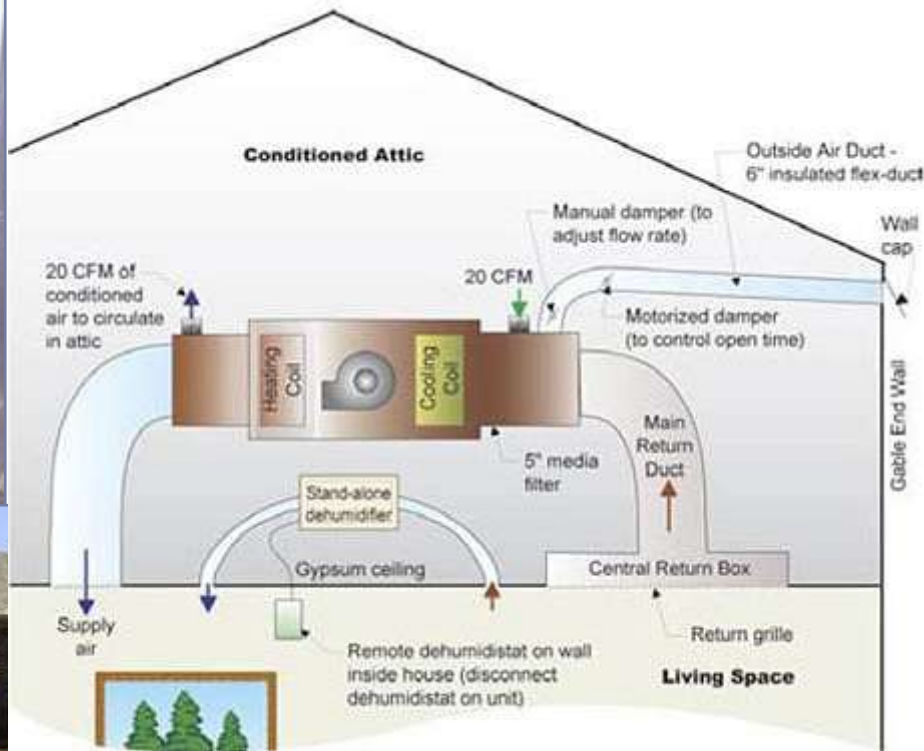


CONSIDER ALTERNATIVE HVAC SYSTEMS

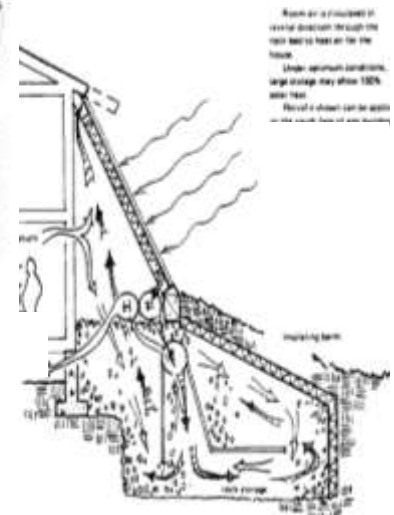
Geothermal



Solar

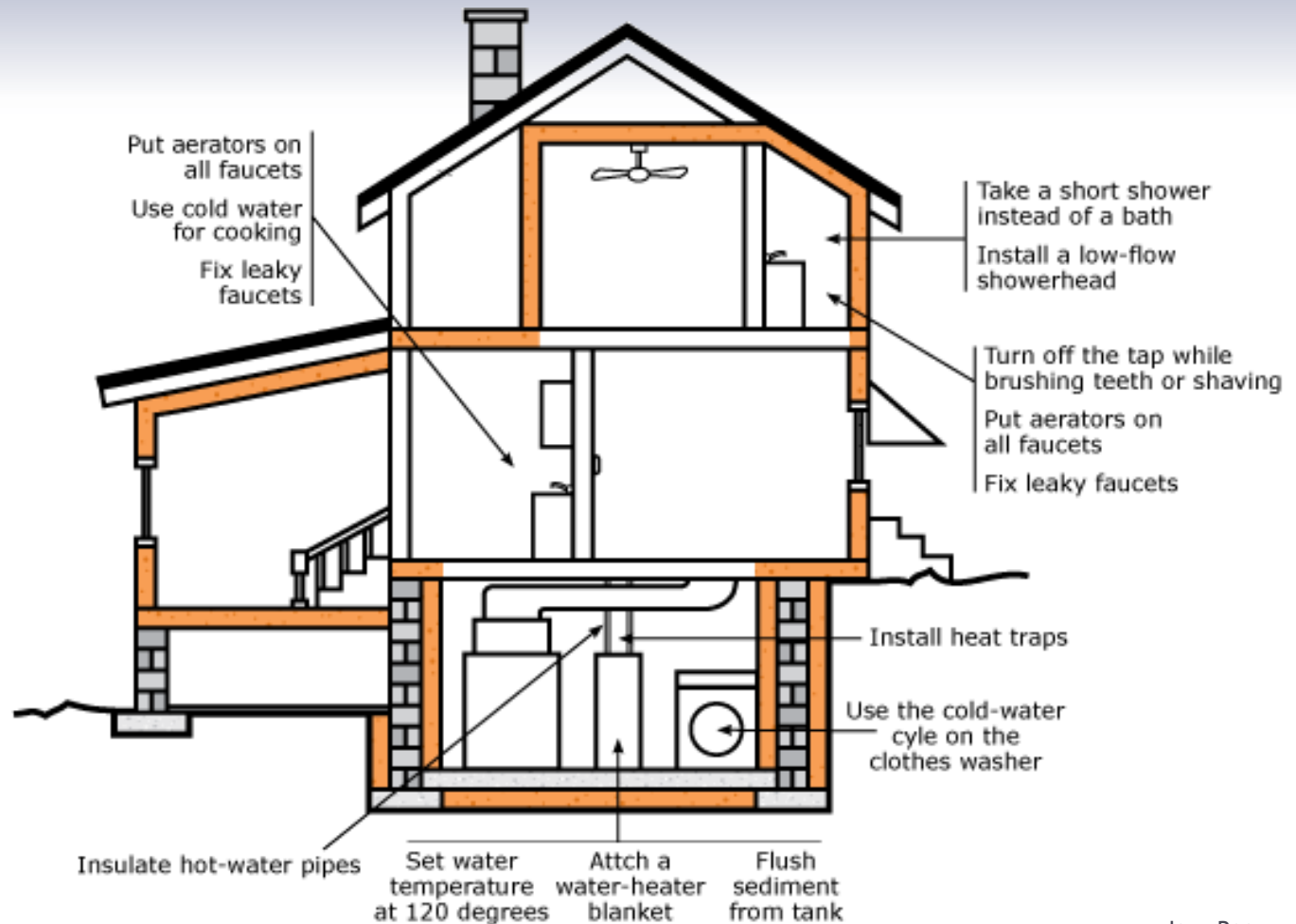


Passive Solar



WATER HEATING

For more information get your free copy of the Iowa Energy Center (IEC), *Home Series 3: Water Heating* booklet at www.energy.iastate.edu/homeseries/.



HOT WATER AND PIPING



- ⦿ Hot water heating is responsible for 20% of the energy used in the home.
- ⦿ Insulate the water heater with at least 3 inches of insulating blanket.
- ⦿ Set thermostat to between 110 and 120°F.
- ⦿ Turn the water heater off during vacations.
- ⦿ Drain 1 gallon every 3 months To remove sediment.
- ⦿ Service gas or oil lines at least once per year.
- ⦿ Take short showers instead of baths.
- ⦿ Use low-flow shower heads and install aerators on all faucets.
- ⦿ Repair leaky faucets promptly.
- ⦿ Insulate pipes.
 - ⦿ All of the hot pipes
 - ⦿ The first 6 feet of the cold pipes.
- ⦿ Use cold water for cooking and clothes washing.

LIGHTING



- ⊙ Understand Kilowatt hours.
 - ⊙ Wattage x hours x cost = energy bill



- ⊙ Replace incandescent light bulbs (60-100 watt bulb provides 15 lumens per watt) with:



- ⊙ Compact fluorescent bulbs (40 watt provides 80 lumens per watt) or



- ⊙ Light-emitting diode (LED) lamps (5 watt fixture provides 20 lumens per watt).

- ⊙ Replace outside lighting with solar light fixtures.



- ⊙ Open drapes during the day.
- ⊙ Paint the walls in light colors.

- ⊙ Use task lighting rather than overhead lamps.



- ⊙ Turn off lights when not in use.
- ⊙ Use timers and motion sensors.

APPLIANCES

- ◎ Common electronic appliances average costs per year:
 - ◎ \$20 Computer or television
 - ◎ \$40 Well pump
 - ◎ \$45 Dishwasher
 - ◎ \$50 Stove
 - ◎ \$80 Washer and dryer
 - ◎ \$85 Refrigerator
 - ◎ \$150 Pool pump and heater

For more information get your free copy of the Iowa Energy Center (IEC), *Home Series 4: Major Home Appliances* booklet at www.energy.iastate.edu/homeseries/.



Look for Energy Star® labels.



APPLIANCES CONTINUED

⦿ Clothes Washer and Dryer:

- ⦿ Wash full loads or use lower water level settings for smaller loads.
- ⦿ Wash and rinse in cold water.
- ⦿ Limit the amount of detergent to only what is necessary.
- ⦿ Keep lint filters clean.
- ⦿ Line dry whenever possible.



APPLIANCES CONTINUED

⦿ Dishwasher:

- ⦿ Wash full loads.
- ⦿ Use shortest wash cycle.
- ⦿ Use energy saver cycle.
- ⦿ Air dry.



⦿ Refrigerator:

- ⦿ Keep door closed and gasket in good repair.
- ⦿ Keep full.
- ⦿ Defrost regularly.
- ⦿ Locate away from heat sources.
- ⦿ Clean coils twice per year (unplug first).
- ⦿ Allow at least 3 inches of air space in the back.



APPLIANCES CONTINUED

⦿ Stove:

- ⦿ Match pots and pans to element.
- ⦿ Use minimum of water and cover pan.
- ⦿ Preheat only when necessary.
- ⦿ Turn off oven 15-20 minutes before cooking time is complete.
- ⦿ Defrost food before cooking (can use 50% less energy).
- ⦿ Maintain door gasket and don't peek!



⦿ Microwave:

- ⦿ Use for cooking vegetables and warming foods.
- ⦿ Do not use to defrost foods.
- ⦿ Defrost foods in the refrigerator.



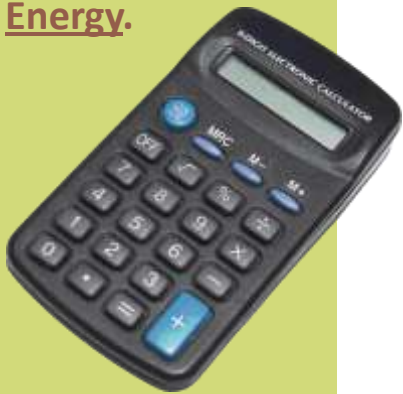
SMART METERING

- ⦿ Local utilities will soon, if they haven't already, be installing smart meters.
- ⦿ Smart meters enable the measurement of energy and water use.
- ⦿ Know your usage levels and take steps to conserve.
- ⦿ Plant trees, hedges, and vines (at least 18 feet from the house) to reduce air conditioning costs.
- ⦿ Water the lawn only when it needs it and then only between 4:00 PM and 10:00 AM.
- ⦿ Place mulch around trees and plants to reduce evaporation.
- ⦿ Plant native vegetation.
- ⦿ Install automatic shut-off on garden hose.



WEATHERIZATION

Calculate energy savings for appliances, HVAC, lighting, thermostat, and water heater at MidAmerican Energy.



- ◎ MidAmerican Energy support to area home owners:
 - ◎ Energy Advantage[®] Programs, call 800-894-9599
 - ◎ Free online and on-site HomeCheck[®], call 800-545-0762
 - ◎ Residential Rebates, call 800-894-9599
 - ◎ Appliance Recycling, call 800-621-2757
 - ◎ Financing, call 800-894-9599
 - ◎ SummerSaver[™] incentives program, call 800-437-2976



CONTRACTOR CERTIFICATIONS

- ◎ Iowa Work Force support to home owners:
 - ◎ **Iowa's Contractor Law – Registration and Bonding**
 - Database of Iowa's current registered contractors
 - Tips on hiring a contractor
 - www.iowaworkfoce.org/labor/contractor.htm
 - Check Local Regulations on county level
 - ◎ If you have any questions contact
 - contractor.registration@iwd.state.ia.us

Division of Labor
Services



Iowa Workforce
Development

TAX ASSESSMENT PROCEDURES

DSIRESOLAR
Database of State Incentives for Renewables & Efficiency

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

North Carolina
Solar Center

IREC

- ⦿ www.dsireusa.org
- ⦿ **Iowa – Tax exemptions are only for Solar and Wind equipment**
- ⦿ Incentives/Policies for Solar
 - ⦿ Property Tax Exemption for Renewable Energy Systems
 - ⦿ 100% exemption for 5 years
 - ⦿ Check City or county ordinances because they can assess 5% annually on the cost of the system with a max total assessment of 30% (Large wind turbines)
 - ⦿ www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=IA02F&re=1&ee=1
 - ⦿ Contact: Greg Watkins -- Iowa Office of Energy Independence
 - ⦿ E-Mail: Greg.Watkins@iowa.gov
 - ⦿ Web Site: <http://www.energy.iowa.gov/>

CODE COMPLIANCE AND ENFORCEMENT

- ⊙ Iowa Building Energy Codes
 - ⊙ 2009 International Energy Conservation Code is mandatory statewide.
 - Can use REScheck to show compliance
 - ⊙ www.energycodes.gov/rescheck/
 - ⊙ For more information go to:
 - <http://www.bcap-energy.org/node/68>
 - Iowa Office of Energy Independence
 - ⊙ www.energy.iowa.gov/



LICENSING AND FRAUD PREVENTION

- ⦿ Locate a Licensed contractor (see contractor certifications on slide 25)
- ⦿ To verify contractor qualifications go to:
 - ⦿ Labor Services division of Iowa Work Force
 - ⦿ www.iowaworkforce.org/labor/
 - ⦿ Development 1(800) 562-4692, Ext. 25871
- ⦿ Helpful Hints:
 - ⦿ Obtain a materials list and scope of work in writing before signing a contract.
 - ⦿ Avoid paying large sums in advance if you don't know the contractor.
 - ⦿ Be very cautious of credit or financing arranged by a contractor.



PROPERTY VALUES AND ENHANCEMENTS

⊙ **Benefits of energy efficient housing:**

- ⊙ Higher property values
- ⊙ Higher re-sale rate
- ⊙ Lower energy costs
- ⊙ More disposable income to apply towards mortgage
- ⊙ IMT Research on Energy Efficiency and Property Value
 - <http://www.imt.org/efficiency-green-building-and-property-value.html>



CONTACT INFORMATION

For more information, visit the Eastern Iowa Community College District, Business and Community Services, Current Events pages for [Energy Efficiency Workshops](#).

For more information, contact:

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