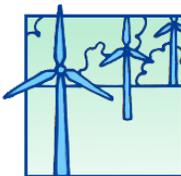
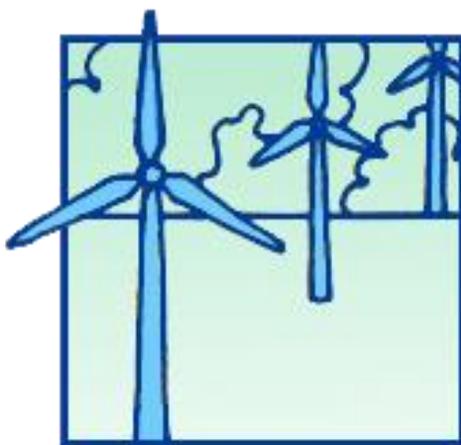


# 2. Spend less on energy

TRANSITION



STREETS



As you know, energy prices are generally going up rather than down. Using less electricity, gas or oil in your home will save you money. Often we waste a lot of energy without realizing it, and there are generally significant savings to be made – without having to go without. Each action in this section of the workbook has a “Potential Savings” section. But it’s not just you and your pocket that’ll benefit.

Using less energy will also reduce the amount of CO2 emitted from fossil fuels as they are burned, either in your home’s furnace/boiler and water heater, or in a power station for your electricity. We all need to reduce our CO2 emissions (our carbon footprint) if we are to minimize the potentially devastating effects of climate change.

More than half the US population lives along the coast and more than 40 large U.S. cities will be partly underwater with a 10 foot sea level rise, such as New York, Boston, Norfolk, Miami and Stockton. More than \$950 billion in property could be lost in Florida alone.<sup>[1]</sup> Fifty percent of the nation’s population lives in coastal communities that will be impacted by rising sea levels.<sup>[2]</sup> Each action you take will have a positive impact on your community and nation.

Finally, there is a finite supply of fossil fuels on this planet and our current cheap supply of them is dwindling. Worldwide oil reserves are going into decline—while demand is growing (even during a recession). Those who minimize their reliance on coal, oil, and gas now will be less exposed to higher prices and supply restrictions in the not-too-distant future.

Being more energy efficient in your home is one of the easiest ways to reduce your costs, your personal contribution to climate change and your vulnerability to fluctuating and increasing energy prices.



Each of the following actions can significantly reduce the amount of energy a household typically uses. Some will cost you little or nothing, some can be paid for using grants and some will cost you money (but should be offset by the reduction in your energy bill sooner rather than later).

- Know how much you are using (2.3)**
- Reduce your standby power load (2.7)**
- See the light (2.9)**
- Control your heat (2.11)**
- Insulating water heater & pipes (2.13)**
- Weatherstripping (2.15)**
- Air sealing (2.17)**
- Attic insulation (2.19)**
- Wall insulation (2.21)**

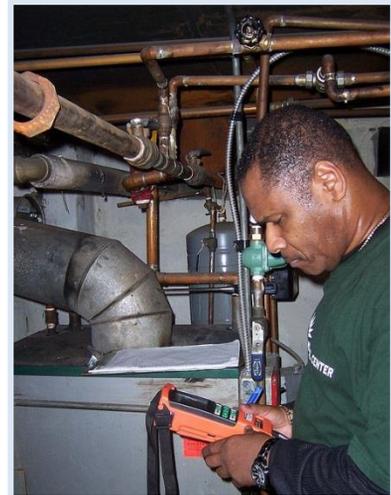


Photo from flickr by Community Environmental Center. Licensed under Creative Commons <https://creativecommons.org/licenses/by-nc/2.0/>

Each action is explained on the following pages. In your group, have a brief chat about all of them and then decide which ones *you* want to tackle and when. Record your own action plan on the page at the end of this section.

The actions listed above are the basic, but most cost-effective, things you can do in your home. At the end of the section are several other actions you may wish to consider once you've done the basics.

For all sections the following estimates are used for...

Costs / savings (dollar savings imply related CO2 savings):

- Low / Less than \$25,
- Medium / Less than \$150,
- High / More than \$150

Effort (estimates based on a 3-bedroom semi-detached home):

- Low Less than 2-3 hours,
- Medium About a day,
- High A day +

Cost: none

\$ Savings: med

Effort: low

CO2 saved: med

Challenge

How much oil, natural gas, and coal do we actually use? Many people know how much money they are paying the utility company, but not how much energy they actually use. Frequent price changes confuse the picture, as your bill could go up even though you are using less.

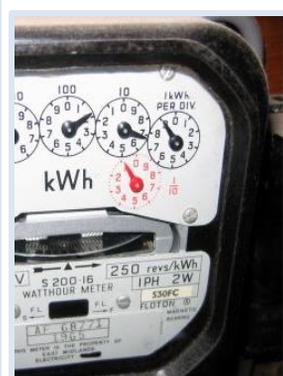
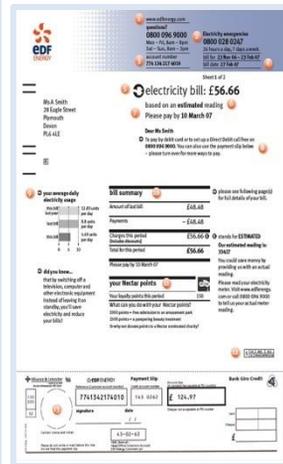
What takes more energy: Heating or Air Conditioning? If we don't know how much we use it is difficult to plan how to use less or to measure the effects of our conservation and efficiency efforts.

If you look beyond the dollars on your electricity and gas bills, you will encounter “kWh” (kilowatt-hour, which measures electric energy) and “therm” or “cu ft” (which measure gas energy). Learning to work with these is a key part of saving energy.

Solution

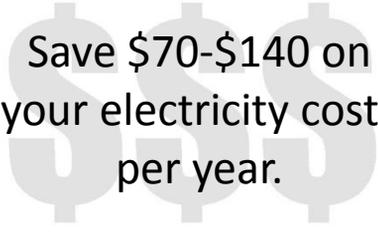
The first step in lowering energy use is learning how much we use. Three ways to monitor your energy use at home:

- 1. Read your monthly electric and gas bills.** Look for how many kWh of electricity were used in the month and how many therm or cubic feet (cu ft) of gas—for month-to-month or year-to-year comparisons.
- 2. Read your own electric & gas meter(s) regularly and keep a record.** (See next page.)
- 3. Use an electricity monitor.** You can borrow or buy a simple plug-in monitor to measure one appliance at a time. Or you can buy a whole-house monitor that's simple to attach to your electric meter. Other whole house monitors clip onto the wires from your electric meter, but if these wires are in a conduit or in a cable, you should have an electrician clip onto wires inside the fusebox or circuit breaker panel where dangerous voltages exist. (See section 2.5)



### Your savings

Studies have shown that people who monitor their energy use typically see reductions of 5-10% per year (\$70-\$140), just by being aware of when things are on and how much each appliance uses.<sup>[3]</sup>



Save \$70-\$140 on  
your electricity costs  
per year.

Notes:

### Next steps, hints, & tips

#### Reading your gas & electric meters

- Start recording your meter readings.
- Read numbers from left to right.<sup>[4]</sup>
- Call your utility or check their website if it's not clear how to read your meter(s).
- Write down your readings at the same time each day, week, or month.
- Subtract the previous reading from the new one to see how many kWh, therm, or cu ft you have used (see page after next).
- Compare it to previous periods to see if and why it's changed.
- Or invest in an electricity monitor (see next page).
- Complete this online Home Energy Saver for your home: <http://hes.lbl.gov/consumer> to get a personalized report of potential savings. Be sure to note your "Session #" so you can return to your report.
- Once you know your usage, shop around for best prices and consider "green" energy—see final section.

**Yes, but ... I can't read my meters.** Your bill also has your energy usage per month. Your utility company may also provide your past year's usage online. (See Local Resources: Energy Usage.)

When you first use your monitor, you'll probably wander around the house turning things on and off, and marveling at the information at your fingertips! It's quite addictive.

Your library or Transition Group may have a plug-in monitor you can use. (See Local Resources: Electricity Monitor.) You may want to borrow or buy a monitor with your group and use it for a week each in turn. This gives you time to find out how much each appliance or lamp uses, and your typical daily use. Then, when you don't have the monitor, you could simply read your electric meter to see your consumption every week, or check your electric bill every month.

### Some whole house electricity monitors:

- PowerCost Monitor (about \$110)
- OWL Electricity Monitor (about \$115)
- Efergy Smart Meter (about \$115)
- The Energy Detective (\$200)

### Plug-in electricity monitor

- Kill-A-Watt (about \$25)

### Online Stores

- [www.amazon.com](http://www.amazon.com)
- [www.realgoods.com](http://www.realgoods.com) (independent)
- [www.sears.com](http://www.sears.com)
- [www.homedepot.com](http://www.homedepot.com)



Also check manufacturers' websites for local stores or where to buy. <sup>[5]</sup>

**How do I use a plug-in monitor?** You plug it into a wall outlet and plug your appliance into the monitor to see how much energy the appliance is eating up. Do this around the house, writing down how much power each appliance uses when switched on, switched off, and if it's on standby.

Do this once and you will have a much better idea of which appliances are energy hogs. You get up-to-the-minute info about how much electricity you are using and how much it is costing you (along with CO2 emissions info).

## Sample meter reading record

Date	Electricity Meter Reading	Usage
8/01/2014	1037	n/a
8/08/2014	1097	60
8/15/2014	1199	102
8/22/2014	1287	88

**Understand how to measure energy use:**

Kilowatts (kW) measure electric *power* –rate at which we use energy.  
Kilowatt-hours (kWh) measure electrical *energy* consumed.

Power is akin to speed, and energy is akin to distance—as we all know, the faster you go, the more quickly you cover a given distance. Similarly, the more power you use, the faster you consume a given amount of energy. So, if you use electricity at a rate of 1kW, you will have consumed 1kWh of energy after one hour. Your electricity meter measures kWh. For older electric meters each digit on the smallest dial is one kWh. (See Local Resources: Electric Meter.)

Approximately every 40W of electric power you use on standby (being used 24 hours a day) consumes 1kWh a day, which costs about \$40-60 a year. Many houses typically use 200W on standby, or about \$200-\$300 a year.

Gas meters measure the volume of gas. They either measure in 100 cubic feet per step of the meter (normally called a CCF or Therm), or 1000 cubic feet. Call your gas company and ask what kind of meter you have. (See Local Resources: Gas Meter.)

To compare gas to electric usage you can convert easily:

100 cubic feet (One Therm) = 29.3 kWh

1000 cubic feet = 293 kWh

Cost: none

\$ Savings: med

Effort: low

CO2 saved: med

## Challenge

Leaving lights, TVs, computers and radios on when there's no one in the room is an obvious waste of money and energy. But even when we switch things off some appliances go to standby mode, which can still consume a lot of energy. Even phone chargers, if left plugged in, will use a little energy, whether or not you're charging your phone.

The average U.S. home spends \$100 a year powering devices that are "off."<sup>[6]</sup>

Unplugging one electric toothbrush or phone charger might not seem like a big deal, but what about that DVD player, the microwave, the printer, the game console, and the digital radio? If you have a lot of equipment on standby, this can add up to significant savings over a year, particularly if they are older appliances.



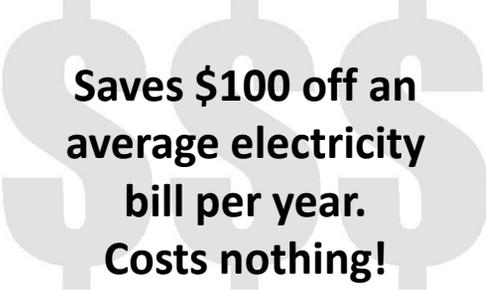
## Solution

Turn things off when you leave the room for more than a few minutes. Turn them off at the plug when not in use. You can buy a "smart power strip" from about \$30 which cuts power to all connected devices with the press of a single button – some are remote controlled. If you need to leave lights on, such as an outside light, use an energy-efficient bulb.

**Yes, but ... I can't turn off my TV's set-top box.** Boxes which can record programs must be left idling around the clock, costing you up to \$25 per year. Integrated digital TV sets or the more expensive models generally use less energy on standby.

### Your savings

In a typical home, turning your appliances off rather than using standby power can save \$100 off your annual electricity bill.<sup>[6]</sup>



**Saves \$100 off an average electricity bill per year.  
Costs nothing!**

Notes:

### Next steps, hints, & tips

- Talk to everyone in your home—try friendly competition to help motivate them.
- Keep a scoreboard on the fridge for every time someone finds a light or TV on when no one is there.
- Motivate your kids with a potential share of the savings!
- Buy a smart power strip as a standby saver (such as from online sources shown on page 2.6).
- You can use an energy monitor to see exactly how much power each item is using when on and when in standby mode (see page 2.6).
- Also, just try using things less often. Dry clothes in the sun not the dryer, turn lights off in the daytime, only wash full loads, etc.

# Transition Streets

## 2.9 SEE THE LIGHT

The Practical  
Action Plan

Cost: med

\$ Savings: med

Effort: low

CO2 saved: med

### Energy challenge

Right now, most of the 600 million light bulbs in U.S. homes are inefficient incandescent bulbs—90% of the energy they use is given off as heat, not light!<sup>[7]</sup> Switching to energy-saving light bulbs will reduce your bills, as they use about a quarter of the power of incandescent bulbs. For example, an efficient 15W bulb is equivalent to an old 60W one.<sup>[8]</sup>

Divide the wattage of your current incandescent bulb by 4 to get a more accurate estimate of the correct low energy equivalent. It's worth buying reputable makes, such as Philips or GE, rather than the discounted brands, which often perform less well and can take a long time to reach full brightness. Choose "warm white" bulbs for a less harsh light.



### Solution

The following energy-saving light bulbs are available:

- **Compact fluorescent lamps (CFLs):** These are the most common energy saving bulbs. They come in twist, stick or candle shape, small or medium screw, and bayonet fittings.<sup>[8]</sup>
- **LED lights:** This technology is progressing rapidly to replace existing bulbs. Although more expensive than CFLs, their cost is coming down.<sup>[9]</sup>
- **Energy-saving halogen light bulbs / lower wattage bulbs:** If you have halogen lights that can't be replaced with CFLs or LEDs, replace them with either energy-saving halogen bulbs which consume about 30% less electricity than standard halogen, or a lower-wattage halogen bulb. You can often replace 50W halogens with 20W ones and still have plenty of light.

**Yes, but ... I have dimmer switches.** If you have a dimmer switch you can buy special dimming energy-saving light bulbs (though they can be more expensive). There are even candle-shaped energy-saving light bulbs to fit in chandelier light fittings.

# Transition Streets

## 2.10 SEE THE LIGHT

### Your savings

Fitting just one energy-saving light bulb can save you about \$3-6 a year. Energy-saving light bulbs are a little more expensive than filament ones—typically costing around \$4 but you'll easily make back the difference on your electricity bill. They last up to 10 times longer than filament bulbs. An average home has 25 bulbs. If all were replaced, this would save about \$75-150 per year.<sup>[10]</sup>



**Saves \$3-6 per light bulb per year. Cost about \$4 each. Lasts much longer!**

### Recycling bulbs

Low-energy bulbs last longer than traditional ones, and CFLs also are recyclable – unlike filament bulbs. See Local Resources: CFL Recycling for information about where you can recycle CFL bulbs.

Notes:

### Next steps, hints, & tips

- Look at the lights in your house. Starting with the brightest and those used the most, consider replacing filament or halogen bulbs with a low-energy alternative.
- See Local Resources: Light Bulb Samples for where you can try before you buy.
- Or, when a bulb goes out, see if you can live (safely) without replacing it at all.
- Most hardware stores and home improvement stores carry a range of new, efficient bulbs, and sometimes offer utility subsidies on the purchase price.
- If you cannot find a local retailer, try looking online.

Lighting efficiency standards have dramatically improved the efficiency of general light bulbs in the US. <sup>[11]</sup>

Cost: none

\$ Savings: med

Effort: low

CO2 saved: med

## Energy challenge

Furnaces, boilers and water heaters account for almost two-thirds of the energy used in our homes, so changing the settings just a little can have a big impact.<sup>[12]</sup> However, many of us don't know how to use the heating controls effectively; mastering them can make a big difference to our pockets.

A programmable thermostat can save you 5 to 15% of your annual heating bill just by turning down the heat at night! But many heating controls have never been programmed, passing up the savings.

## Solution

You may already have a full set of heating controls in your home, but are you getting the best from them?

Take a little time to find out what each control does by referring to the instruction manuals that came with them. If you don't have any manuals on hand, copies can usually be downloaded from the manufacturer's website, or call and ask them to send you a printed copy (See section 2.28 for the **Heating Controls** summary guide).



**Yes, but ... I like being cozy at home.** At what price? You can often achieve the same effect by wearing more clothes.<sup>[13]</sup> Modern thermal underwear can keep you warm for little cost. You could also try air sealing or fitting additional insulation to keep more of your heat inside (see later actions).

### Your savings

For every degree you turn it down, just at night, you can save about 1% of your total heating bill! <sup>[14]</sup>

If you use a programmable thermostat, it could save you 5% to 15% of your heating bill.



Notes:

### Next steps, hints & tips

- Set your thermostat to 65° F . Of course, it depends where the thermostat is . Make sure it's not in a cold hallway.
- Dig out the instructions for the programmable thermostat.
- Set the heating to come on 20 minutes before you get up and go off 15 min before you leave home.
- Your hot water heater's setting should be at 140° F (or 60° C). Any higher is a waste of energy and can scald, any lower and there may be risk of legionella. <sup>[15]</sup>
- Upgrade to a programmable thermostat for around \$25+.
- Heat the rooms you use most, rather than the whole house. Closing vents or radiator valves will help. Use TRVs (thermostatic radiator valves) on your radiators.
- Turn the heat down when on vacation or out for the night.
- Keep curtains and furniture away from vents and radiators to let heat circulate.
- Set the temperature lower in the bedroom at night, it helps you nod off and promotes deeper sleep.

## 2.13 INSULATING WATER HEATER &amp; PIPES

Cost: med

\$ Savings: med

Effort: med

CO2 saved: med

## Challenge

Many hot water heater tanks in our homes are not sufficiently insulated. This means that heat is continually being lost, and your heater has to work harder to keep the stored water at the desired temperature. Heat is also lost from pipes that carry hot water around your house.



## Solution

Both tank insulation and pipe insulation will keep your water hotter for longer by reducing the amount of heat that escapes. This reduces your fuel bill and saves you money. Wrapping hot pipes in foam sleeves stops them losing heat through contact with cold air. Both tank insulation and pipe insulation are cheap and easy to fit, so this is a DIY option even if you're renting.

**Yes, but ... I can't access most of my hot water pipes.** If you can afford it, get professional help. Otherwise just do the ones that you can easily reach. It's often easier to access pipes when you're remodelling.

Notes:

### Your savings

A hot water heater jacket costs about \$25 and pays for itself in a year. <sup>[16]</sup>

Insulation for hot water pipes will cost about \$10 to \$15 and save you around \$10 - \$15 a year (a 100% return on investment).<sup>[17]</sup>

### Next steps, hints & tips

- Touch your hot water tank. If it feels warm, it needs a jacket.
- Measure and write down the tank size (diameter, height gallons).
- Fit an insulating jacket (3 inches or 75mm thick) around your hot water tank.
- Feel your water pipes and consider insulating those that are hot. Buy foam tubes and fit to pipes.
- Insulation should be at least 8 inches away from a gas flue. If pipes are within 8 inches use unfaced fiberglass and secure with wire.



**Save \$25 - \$40 a year  
with a one-off  
investment of \$25**

For DIY guides, see <http://www.energy.gov/energysaver>

Cost: med

\$ Savings: med

Effort: med

CO2 saved: med

### Challenge

If you can feel cold air coming in around the windows and doors in your home, it means warm air is escaping. Sitting in a draft doesn't just give you a pain in the neck—in a typical home small air leaks add up to the equivalent of having one window open every day!<sup>[18]</sup>

Save 20% off your  
heating and cooling  
bills per year.



### Solution

A drafty window or door is quickly and cheaply remedied by a visit to the DIY shop. Weatherstripping seals gaps around windows, doors, attic hatches and other movable parts of your home and decreases the amount of cold air leaking in. Once it's snug, you'll start saving cash and CO2 as well as feeling more warm and comfortable.

There are several types of materials available from DIY stores including brushes, foams and sealants, strips, and shaped rubber or plastic. Check the quality of the products. Metal, silicone and rubber are the longest lasting, while vinyl and foam are the shortest lived.

**Yes, but ... doesn't my house still need to breathe?** Once the drafts are plugged, it's important the house is still ventilated. In kitchens and bathrooms, you might need a ventilation fan if condensation is a problem.

### Next steps, hints, & tips

- Find out where the drafts are coming from: older windows, door frames and attic hatches are all easy to check and remedy. On a windy day use a stick of incense to look for drafts.
- Measure external doors and windows and buy draft seals from the DIY shop. Seals are usually made from self-adhesive foam, rubber, or brush material.
- Get a brush-style draft stopper for your mail slot or seal it up and use an external mailbox.
- Seal unused chimneys with a solid plug or a chimney balloon. Remember to take them out again should you decide to use your chimney.
- Draw your curtains at dusk for extra draft exclusion, and keep them behind radiators, otherwise you're just heating the window.
- Curtains wearing thin? Sew a layer of heavy lining material inside them or pay someone to do it for you. Charity shops often have cheap curtains.
- Windows still drafty, but can't afford double glazing? Cover them in a clear plastic film (available at DIY shops) that tightens over the pane when heated with a hairdryer.
- Low-e storm windows are an affordable alternative to window replacement. The Low-e coating keeps heat in and hot sun out.<sup>[19]</sup>
- See Local Resources: Weather Stripping for information about refunds, grants and classes specific to your area.

Notes:

See <http://energy.gov/energysaver> for tips on weatherstripping doors, windows and more.

# Transition Streets

## 2.17 AIR SEALING

The Practical  
Action Plan

Cost: High

\$ Savings: High

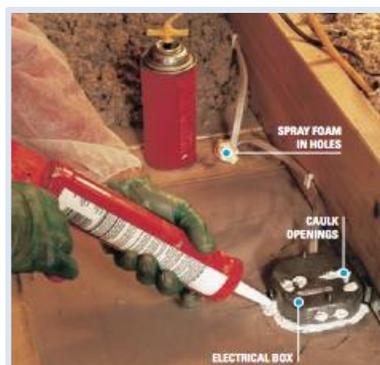
Effort: med

CO2 saved: high

### Challenge

Often the largest air leaks are hidden in the attic and basement, unlike air leaks around doors and windows where drafts are easy to feel. Large holes around chimneys, plumbing pipes or over kitchen cabinets can let heated air rise into the attic and pull cold air in through leaks into the basement.

Save 20% off your  
heating and cooling  
bills per year.



### Solution

Air leaks can be found and sealed resulting in a much more comfortable home and lower energy bills. Air sealing stops air from blowing through existing insulation making the insulation much more effective.

A good air sealing job in the attic and basement stops air from circulating, reducing cold drafts.

You can hire a professional to do air sealing (medium effort on your part but higher cost). Or find and seal those leaks yourself (high effort, medium cost) with the help of several excellent DIY guides (try searching “air sealing” at <http://energy.gov/energysaver/energy-saver>).

Notes:

**Yes, but ... Is my furnace or water heater getting enough air?** Most houses leak plenty of air. But after air sealing an energy auditor can conduct a Combustion Safety Test to make sure your furnace and water heater is getting enough air.

### Next steps, hints, & tips

- A professional or DIY audit can help you find air leaks in your attic or basement before you begin.
- If you hire professional help, make sure they use a blower door to look for air leaks before and after they finish air sealing. There should be a dramatic reduction in the air leakage rate. They can also make sure your furnace and water heater are getting enough air. For more information on professional home energy audits, visit <http://energy.gov/energysaver/articles/professional-home-energy-audits>
- Sewer vent pipes and other plumbing running from basement to attic are common air leaks.
- Check that all light fixtures that poke into the attic are caulked and sealed.
- Where walls meet the attic is another common air leak.
- Holes drilled for electrical wires are a path for air to move through walls and from the basement to the attic.
- For a detailed instructions on finding and closing air leaks, see “A Do-It-Yourself Guide to Sealing and Insulating with Energy Star.” It is excellent for its pictures and tips, plus helpful advice on when to bring in professional help. Available at [http://www.energystar.gov/ia/partners/publications/pubdocs/DIY\\_Guide\\_May\\_2008.pdf?8de2-b8ac](http://www.energystar.gov/ia/partners/publications/pubdocs/DIY_Guide_May_2008.pdf?8de2-b8ac)
- For a more technical guide, see “Attic Air Sealing Guide and Details” which has excellent diagrams and instructions. Available at <http://www.buildingscience.com/doctypes/guides-and-manuals>
- If you live in a cold climate, see “Home Envelope Guide” for DIY help with air sealing and insulation. Available at <http://mn.gov/commerce/energy/images/Building-Envelope-Guide.pdf>
- See Local Resources: Air Sealing for information about grants, classes and recommended contractors specific to your area.

Notes:

# Transition Streets

## 2.19 ATTIC INSULATION

The Practical  
Action Plan

Cost: high

\$ Savings: high

Effort: med

CO2 saved: high

### Challenge

Attic insulation keeps your house warmer in winter and cooler in the summer. In an un-insulated home, a quarter to a half of your heat is lost through the roof.

Insulating your attic is a simple and effective way to reduce your heating bills and you can even do it yourself. Already got insulation? Many older homes can save quite a bit by adding more.



### Solution

Insulation acts as a blanket, trapping heat rising from the house below, but also keeping out summer heat. Insulating material is simply laid over the floor of the attic, between and over the joists if they are visible.

Attic insulation can be carried out as a DIY task or by a professional installer. Hiring a professional will involve medium effort on your part but higher cost. The effort will be high if you do it yourself. There are often grants and special offers available to help you pay for attic insulation. See Local Resources: Attic Insulation.

**Yes, but ... I don't know which materials to use.** Each type of insulation material has its own strengths and weaknesses. Their suitability for you will depend to an extent on the nature of your attic space—but all of them are a better bet than not insulating it at all. Natural and recycled material options are available. Learn more about different types of insulation at <http://energy.gov/energysaver/articles/insulation-materials>

# Transition Streets

## 2.20 ATTIC INSULATION



### Your savings

Even if you already have some attic insulation the DOE estimates air sealing and insulating your attic can save you up to 20% of your heating and cooling bills in both warm and cold climates. <sup>[20]</sup>



**Save 20% of your heating and cooling bill per year.**

Notes:

### Next steps, hints, & tips

- Always perform attic air sealing before adding insulation, because insulation will not stop air leaks.
- Check your existing insulation level: R30+ for hot climates like Texas, R38+ for medium climates like Kansas, R49+ for cold climates like Iowa. <sup>[21]</sup>
- Do not insulate if you have old knob and tube wiring.
- You must protect recessed lights (protruding through the top floor ceiling ). See the DIY guide below for necessary steps.
- Decide whether you want to install it yourself or get a professional to do it. Consider which material you prefer.
- Check Local Resources: Attic Insulation for possible grants or rebates.
- Always wear protective masks, eyewear and clothing when handling insulation.

Read this “Attic Insulation Project” DIY guide for detailed instructions and advice to see if you want to do it yourself:

[http://www.energystar.gov/index.cfm?c=home\\_sealing.hm\\_improvement\\_attic\\_insulation](http://www.energystar.gov/index.cfm?c=home_sealing.hm_improvement_attic_insulation)

# Transition Streets

## 2.21 WALL INSULATION

The Practical  
Action Plan

Cost: med

\$ Savings: high

Effort: med

CO2 saved: high

### Challenge

In most houses in the U.S., the external walls are stud walls with a cavity between studs. If the cavity is empty, your home has un-insulated walls, and a considerable slice of your energy bills will be spent heating the air outside. In fact, about a third of all the heat lost in an un-insulated home is lost through the walls.

Wall insulation is a simple, fantastic way to make your home feel more comfortable and significantly reduce the amount of energy you need to heat your home.

### Solution

Filling the gaps between the studs and the inside and outside finished surfaces (the cavity) with an insulating material significantly decreases the amount of heat which escapes through the walls. It will help keep the temperature in your home even, prevent condensation on the walls and ceilings, and can also reduce the amount of heat building up inside your home during summer hot spells.

Insulation can normally be applied from the outside through small holes drilled in the wall. It's a simple process for a professional installer and is normally completed within a few hours, without damage or mess to your house or garden. Be sure to get advice from a reputable installer who offers a long-term guarantee.



**Yes, but ... why spend all this when I'm going to sell my house anyway in the next few years?** Wall insulation will increase your home's efficiency, potentially adding value to your home.

# Transition Streets

## 2.22 WALL INSULATION

### Your savings

Wall insulation can significantly cut both heating and cooling bills.

Savings vary widely with climate and energy costs, but the Department of Energy found that adding insulation will pay for itself in 3-12 years, which translates into a 30% to 8% rate of return on investment, respectively. <sup>[22]</sup>

### Notes:



**Pays for itself in 3-12 years  
– earning you money  
every year after.**

### Next steps, hints, & tips

- Most houses have a wall cavity that can be insulated.
- Drilling a small hole can help you find out if the wall already has insulation.
- Dense pack cellulose helps restrict air movement and creates a more air tight house. It can even be blown into cavities with failing fiberglass batts.
- Many utilities or localities offer grants, loans, or other incentives for adding insulation. See Local Resources: Wall Insulation for details.
- See <http://energy.gov> for the article “A Consumer’s Guide to Home Energy Upgrades.” It has advice on choosing air sealing and insulation options.

## 2.23 YOUR ENERGY ACTION PLAN

Reminder

Possible actions:

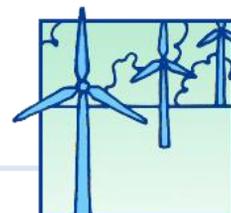
- Know how much you are using (2.3)
- Reduce your standby power load (2.7)
- See the light (2.9)
- Control your heat (2.11)
- Insulating water heater & pipes (2.13)
- Weatherstripping (2.15)
- Air Sealing (2.17)
- Attic Insulation (2.19)
- Wall Insulation (2.21)

**What other ideas does your group have that aren't covered above? Add them below if you think they are relevant for you.**

My actions	Previously done	When I'll do this	Notes

Group actions

How can you help each other in your group? List group actions here (with named person and due date).



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## 2.24 ENERGY: THE BIGGER PICTURE DISCUSSION

### The bigger picture

As we have seen there are many different actions that you can take to save energy. Taken together, all these actions play a significant part in saving you money, as well as reducing our energy consumption — which means fewer fossil fuel power stations being built to supply us with energy, be they coal, nuclear, oil or gas.

Just by turning off appliances that are on standby, we can save up to \$100 per year. That may not sound like much, but if we all cut this out we would save quite a bit. What would your town do with the extra money?

- What are the real reasons for us continuing to waste energy?
- Why is it so difficult to stop using so much energy?
- What do you think you will need to do to change these habits in your home?

Notes:

The following pages are for reference information only; they don't need to be discussed at the energy session.

# Transition Streets

## 2.25 REFERENCES

- [1] Benjamin Strauss, "What does U.S. look like with 10 feet of sea level rise?" Climate Central, 05/13/2014, <http://www.climatecentral.org/news/u.s.-with-10-feet-of-sea-level-rise-17428>
- [2] National Atmospheric and Oceanic Administration, "NOAA, USGS: Climate change impacts to U.S. coasts threaten public health, safety and economy," 01/28/2013, [http://www.noaanews.noaa.gov/stories2013/20130125\\_coastalclimateimpacts.html](http://www.noaanews.noaa.gov/stories2013/20130125_coastalclimateimpacts.html)
- [3] Martin Holladay, "Home Dashboards Help to Reduce Energy Use," 01/15/2010 <http://www.greenbuildingadvisor.com/blogs/dept/musings/home-dashboards-help-reduce-energy-use>
- [4] Energy.gov, "How to Read Residential Electric and Natural Gas Meters," 6/24/2012, <http://energy.gov/energysaver/articles/how-read-residential-electric-and-natural-gas-meters>
- [5] Here are some manufacturers of electricity monitors: <http://www.bluelineinnovations.com>, <http://www.theowl.com>, <http://efergy.com/us>, <http://www.theenergydetective.com/compare>
- [6] Energy.gov, "3 Easy Tips to Reduce Your Standby Power Loads," 11/1/2012, <http://energy.gov/energysaver/articles/3-easy-tips-reduce-your-standby-power-loads>
- [7] Energy.gov, "Lighting Choices to Save You Money," 11/05/2014 <http://energy.gov/energysaver/articles/lighting-choices-save-you-money>
- [8] EnergyStar.gov, "Learn About CFLs," [http://www.energystar.gov/index.cfm?c=cfls.pr\\_cfls\\_about](http://www.energystar.gov/index.cfm?c=cfls.pr_cfls_about)
- [9] EnergyStar.gov, "Learn About LED Bulbs," [http://www.energystar.gov/index.cfm?c=lighting.pr\\_what\\_are#led\\_different](http://www.energystar.gov/index.cfm?c=lighting.pr_what_are#led_different)
- [10] Energy.gov, "How Energy-Efficient Light Bulbs Compare to Traditional Incandescents," 11/05/2014, <http://energy.gov/energysaver/articles/how-energy-efficient-light-bulbs-compare-traditional-incandescents>
- [11] U.S. Energy Information Administration, "Light Bulb Standards Begin Taking Effect in 2012," 12/02/2011, <http://www.eia.gov/todayinenergy/detail.cfm?id=4150>
- [12] U.S. Energy Information Administration, 03/07/2013, "Heating and cooling no longer majority of U.S. home energy use," [http://www.eia.gov/todayinenergy/detail.cfm?id=10271&src=%E2%80%B9%20Consumption%20%20%20%20%20Residential%20Energy%20Consumption%20Survey%20\(RECS\)-f1](http://www.eia.gov/todayinenergy/detail.cfm?id=10271&src=%E2%80%B9%20Consumption%20%20%20%20%20Residential%20Energy%20Consumption%20Survey%20(RECS)-f1)
- [13] Low-Tech Magazine, "Insulation: First the Body, Then the Home," <http://www.lowtechmagazine.com/2011/02/body-insulation-thermal-underwear.html>
- [14] Energy.gov, "Thermostats," <http://energy.gov/energysaver/articles/thermostats>
- [15] Energy.gov, "Savings Project: Lower Water Heating Temperature," <http://www.energy.gov/energysaver/projects/savings-project-lower-water-heating-temperature>
- [16] Energy.gov, "Savings Project: Insulate Your Water Heater Tank," <http://energy.gov/energysaver/projects/savings-project-insulate-your-water-heater-tank>
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- [19] Energy.gov, "Storm Windows (Even With a Low-E Coating!)," 11/11/2008, <http://energy.gov/energysaver/articles/storm-windows-even-low-e-coating>
- [20] EnergyStar.gov, "Methodology for Estimating Energy Savings from Cost-Effective Air Sealing and Insulating," [http://www.energystar.gov/index.cfm?c=home\\_sealing.hm\\_improvement\\_methodology](http://www.energystar.gov/index.cfm?c=home_sealing.hm_improvement_methodology)
- [21] EnergyStar.gov, "Checking Your Attic Insulation Levels," [http://www.energystar.gov/index.cfm?c=home\\_sealing.hm\\_improvement\\_inspections#attic](http://www.energystar.gov/index.cfm?c=home_sealing.hm_improvement_inspections#attic)
- [22] Energy.gov, "Living Comfortably: A Consumer's Guide to Home Energy Upgrades," 3/07/2013, <http://energy.gov/articles/living-comfortably-consumer-s-guide-home-energy-upgrades>

#### Overview and where to go for more information

You may want to explore these actions **once you've done the basics** outlined in this workbook. They tend to take more effort and/or more investment with a longer payback period. However, they can significantly further reduce your energy use and your carbon footprint.

#### **Buy a new, high-efficiency heating and cooling equipment**

Heating and cooling equipment can account for as much as 50% of a home's energy. New high-efficiency equipment will significantly cut your home's CO2 emissions and could save as much as \$200 a year depending on what climate you live in. In a cold climate, consider a high-efficiency condensing furnace or boiler and improved heating controls. In a hot climate, you could reduce your cooling energy by 20% to 40% with a new high efficiency central air conditioner. For more information and advice, see

<http://energy.gov/energysaver/articles/furnaces-and-boilers>

<http://energy.gov/energysaver/articles/air-conditioning>

#### **Replace your windows**

Windows account for 30% of a typical home's heat loss. New windows with double panes and a low-e coating (low-emissivity) cut drafts and heat loss in cold climates and cut undesirable heat gain in warm climates. Triple pane windows are now a popular way to replace windows, and may be worth considering. For more information and advice, see

<http://energy.gov/energysaver/articles/energy-efficient-windows>

#### **Plan carefully for basement wall insulation**

In climate zone 3 and colder, basement wall insulation increases comfort and saves energy. But first solve any water entry problems – whether from rain events or melting snow – before insulating. Then use only rigid or sprayed foam that is not damaged by water. Don't use fiberglass batt or cellulose in the basement. For more information and advice, see

<http://www.greenbuildingadvisor.com/blogs/dept/musings/how-insulate-basement-wall>

#### Overview and where to go for more information

##### **How you landscape your yard makes a difference.**

The plants and yard around your home can reduce your energy bills, increase your comfort, and reduce your water usage. See water section or visit <http://energy.gov/downloads/energy-saver-101-landscaping> for more info.

##### **Switch to a renewable/green energy provider.**

Many utilities offer a renewable energy option. This might cost a little more each month, but as more people sign up the utility has to increase its renewable sources.

If you can, switch to a renewable energy supplier to reduce demand for fossil fuel and to create demand for renewable technologies. This supports new jobs in this industry that is so critical to dealing with climate change. Here's state-by-state list of organizations that offer green power:

[http://apps3.eere.energy.gov/greenpower/buying/buying\\_power.shtml](http://apps3.eere.energy.gov/greenpower/buying/buying_power.shtml)

##### **Explore options for Renewable Energy.**

Many people have their own renewable energy system. In an unshaded spot on your lot might you could install a solar PV array to generate electricity, a solar thermal system to heat water or maybe provide some space heating. A creek on your property might provide some hydroelectric power. A large open area with few obstructions would offer an opportunity for electricity from the wind. See <http://energy.gov/energysaver/articles/planning-home-renewable-energy-systems>

Renewable energy systems are effective alternatives to fossil fuels and will help you to meet your own energy requirements and to reduce your home's CO2 emissions. They can be expensive, with payback periods of 5-10+ years (at current energy costs).

<http://energy.gov/energysaver/articles/planning-home-renewable-energy-systems>

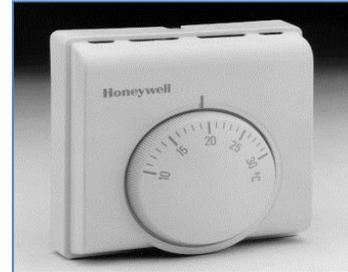
##### **Look for rebates that are available:**

Here is information on each states' incentives and policies that support renewables and energy efficiency: <http://www.dsireusa.org>

### Overview

#### **What is a room thermostat?**

This constantly measures the air temperature of a space to control when your furnace or boiler turns on. You can set it for whatever temperature suits you best. When the temperature falls below the setting, the thermostat switches on the central heating. Once the room reaches the set temperature, the thermostat switches the heating off. Thermostats are usually in halls, stairs, or landing areas.



#### **What is a programmable room thermostat?**

A programmable room thermostat lets you choose the times you want your home to be heated and the temperature you want it to reach while it is on. In other words, it allows you to heat rooms or the whole house to different temperatures at appropriate times of the day and week. And again, by heating your home and only when necessary, it can save energy and money too.



#### **What are thermostatic radiator valves (TRVs)?**

TRVs sense the air temperature around them and regulate the flow of hot water to keep a set temperature in a room. They can save money and energy by allowing different temperatures in some rooms than in others, and to turn off heating in rooms that are not used.



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## 2.30 LOCAL RESOURCES

### Where to go for local information

**Electric Meter:** Replace this note with information about local utility bills and how to read the electricity usage. Also note where to get online usage information from your utility.

**Gas Meter:** Replace this note with information on how to read the gas meter and if gas is measured in Therms (100 cubic feet) or 1000 cubic foot units.

**Electricity Monitor:** Replace this note with information about local meters available from your energy provider, local government, library or if your Transition Group intends to have meters available to borrow.

**Light Bulb Samples:** Replace this note with information on where homeowners can view light bulbs operating before they purchase, or if your Transition Group is providing a box of bulbs to sample.

**CFL Recycling:** Replace this note with information about where CFL bulbs can be recycled.

**Energy Audit:** Replace this note with local energy auditing guides, grants, and utility rebates. DIY guides or reputable local contractors.

**Weather Stripping:** Replace this note with local weather stripping guides, notes on air sealing resources, grants, contractors, etc. Consider offering DIY classes on installing weather stripping.

**Air Sealing:** Replace this note with local air sealing guides, notes on air sealing resources, grants, contractors, etc.

**Attic Insulation:** Replace this note with local attic insulation guides, notes on attic insulation resources, grants, contractors, etc.