



The downwithco2.co.uk guide to making big cuts in your home's energy consumption,..... and your energy bills.....



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Chapter 1: The top five measures you can take

By taking just a few measures, you can make big cuts in your home's energy consumption, and your heating and electricity bills. Plus by doing this you will be helping to cut your home's contribution to global warming, by helping to cut the amount of fossil fuel that is burnt. This short booklet tells you the main things that you should focus on, and what to look out for.

Concern over energy consumption has grown greatly in recent years. Gas and electricity prices have been at record highs, hitting homeowners in their pockets. Plus there is a growing realisation amongst the general public that our energy consumption is causing global warming, which is leading to growing problems with our climate. In a recent Henley Centre survey, over 62% of respondents said that climate change is the biggest single problem facing the world today.

We use a great deal of energy in our homes. They account for over a quarter of greenhouse gas emissions in northern countries like the UK. However, reducing your energy use is in most cases quite easy. It can also be very lucrative: some of the major actions you can take pay back very quickly. You soon start saving a small fortune.



Below are listed 4 or 5 simple measures that almost every householder should focus on. Each one of these is explained in more detail later in this booklet.

1. Insulate your home. By keeping more of the warmth in your home in winter, you will save a small fortune on your heating bills. The most common types of insulation to install are in the loft and also in the gap between your external walls (called 'cavity wall insulation'). You can also insulate your floors and walls. Not only will this save you money, but your home will be more comfortable in winter and cooler in summer. Plus in the UK, because the government subsidises insulation, the investment needed will normally payback in under 2 years. Moreover, on average you will be preventing 1 to 2.5 tonnes of carbon dioxide being emitted each year. *For more information see page 5*
2. Upgrade to a super-efficient condensing boiler. Your boiler is the main energy user in the house. Modern condensing boilers are far more efficient than some models made even 5 years ago. They use far less gas, and can save you up to 40% off your heating bills as a result. They last for around 15 years so the savings really add up over time. Because of subsidies from the government and energy companies the financial case



is made even better. Plus by doing this you are saving an estimated 1.25 tonnes of carbon dioxide each year. *For more information see page 7*

3. Replace your light bulbs with low energy bulbs. These use up to 80% less electricity used by traditional incandescent bulbs, and are now indistinguishable in terms of the light they emit. Plus they last up to 10 times longer. So as well as cutting your electricity bills, you don't have to get the ladder out so often to replace bulbs that have blown. Now that these bulbs have come down in price, they can payback their extra cost in a very short time (only a couple of months) in terms of lower electricity bills. *For more information see page 9*
4. Install energy efficient home appliances. Replacing your old fridge with the most energy efficient models can save you a small fortune on your electricity bills. In fact with the most energy efficient models, the savings can actually add up to cover the entire cost of the new fridge! Plus you can also buy other energy efficient appliances, such as washing machines and dishwashers. In the EU all appliances carry an energy efficiency rating, so it is easy to spot the most efficient. *For more information see page 11*
5. Install a solar hot water system. This is the most expensive of the measures mentioned in this article, but still worth doing for many householders, even in northern climates. A solar system can provide up to 70% of your hot water needs in a year, saving on your gas bills. Using solar panels mounted on the roof, solar hot water systems can be installed in most houses. This is a tried and tested technology, and you may qualify for a government grant to help with the cost of installation. *For more information see page 13*

By taking these 5 measures, the average householder can save hundreds of pounds a year off their energy bills, and prevent several tonnes of carbon dioxide being emitted into the atmosphere. Even taking one or two of these steps has a big impact.

Plus for those who want to make an even bigger reduction in their home's energy use, there are also more advanced measures to be considered such as solar electricity and ground source heat pumps. These generally cost more, but can allow your home to lower even further its impact on Climate Change. More information on these can be found on <http://www.downwithco2.co.uk>

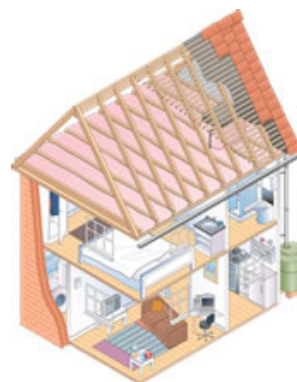
With energy prices set to stay high and time running out to prevent harmful changes in the earth's climate, it really does make sense to improve our homes as soon as possible to include these measures.

Chapter 2: Home insulation

Insulating your home is normally the biggest single thing you can do to save money on gas and electricity, and cut your personal contribution to climate change. The following article tells you about some of the things to think about.

You can add insulation to almost any home. Depending on the structure of your building, the best areas to add insulation are normally the loft, and also the cavity between your home's inner and outer walls.

Insulating these saves a lot of energy and based on calculations for a British home, usually covers its cost within 2 years. What's more, if you properly insulate your home you will prevent several tonnes of carbon dioxide being emitted into the atmosphere each year.



Insulating your cavity walls and loft will have the biggest impact on your bills.

More heat is lost through walls than any other route – approximately 33% in an un-insulated home. 270 mm (10 inches) of loft insulation can save up to 25% of a home's heating costs.

In most houses in the United Kingdom built after the 1920s, the external walls are made of two layers with a small air gap or 'cavity' between them. If your home has unfilled cavity walls, a considerable slice of your energy bills will be spent heating the air outside. Filling the gap between the two walls of a house with an insulating material massively decreases the amount of heat which escapes through the walls. It will help create a more even temperature in your home, help prevent condensation on the walls and ceilings.

Cavity wall insulation is quick, clean and relatively inexpensive to install. It's injected into the cavity from the outside, taking between two and three hours for a three bedroom semi-detached house. In the United Kingdom its cost is heavily subsidised by the government, and so it can cost under £200 to have installed. With the savings homeowners then make on their heating bills, it can pay for itself in under 2 years.

Another really important area to consider is that you could be losing up to a quarter of the heat in your house through your roof. Loft insulation can cut this right down. The recommended depth for insulation is at least 270mm. If you currently have insulation that is less thick than this you may consider adding another layer, although the payback time is longer.



There are various materials that you can use to insulate your loft. Most frequently used is mineral wool, although you can now use real wool if you want a natural alternative. In the United Kingdom most people prefer to use a professional insulation contractor, who should also help you get government grants to reduce the cost. Because of the grants, using a contractor is normally cheaper than doing it themselves and with a professional you know that the job will be properly done.

Other cheap and easy steps which are well worth considering include insulating your hot water tank, insulating your home's pipe-work and installing draught-proofing. Many homes are leaking heat through gaps in the joins on the panels that make up their windows and doors. In a typical home 20 per cent of all heat loss is through ventilation and draughts. Draught proofing is one of the least expensive and most effective energy efficiency measures for the home - yet it is too often overlooked.

Draught proofing offers a quick return, frequently paying for itself within a year and then saving year after year. There are many types of product - for around windows (sash, metal, timber); external doors (including weatherbars for door bottoms); internal doors - particularly kitchens, bathrooms and main living areas; the loft hatch, and even letter boxes, key holes and cat flaps!

Insulation, although not as headline grabbing as solar panels and wind turbines, is definitely the first place to start to make your home more comfortable and energy efficient.

If you are interested in having your home properly insulated you can request a free, no obligation home survey in just a few seconds at www.downwithco2.co.uk

Chapter 3: How a new boiler can save you more than a third off your heating bill

A new modern boiler can save you a great deal of money on your energy bills, by using heat much more efficiently. With gas prices recently at record highs, and growing concern over Climate Change, it makes sense for many people to upgrade their old boilers. This article tells you what to look out for, and how to investigate further.

If you live in a climate with cold winters, your central heating boiler is by far the most energy-hungry appliance in the house. A boiler in the average UK home burns over £500 worth a gas each year, and is responsible for emitting almost 4 tonnes of carbon dioxide into the atmosphere. As high energy prices hit householders in the pocket, and more and more people are becoming concerned about Climate Change (caused by the burning of fossil fuels like gas), many people are finding that it makes sense to install a new boiler.

Older boilers waste heat and money every time they fire up. This is because a lot of the heat that is generated from burning the gas is lost up the chimney or flue. Modern boilers are much more efficient because they recover and recycle a lot of this heat, and so need to use less gas. This can save you up to 40% or £200 a year off the average UK gas bill.



The most efficient type of boiler is a Condensing Boiler, which now achieves almost 90% efficiency on the fuel it burns, far higher than older boilers. They normally cost a bit more than other types of boiler up front, but save a lot of money in the long run because you spend less on fuel. The most common alternative is called a Combination Boiler, which activates on demand, which means less wasted energy and no need for water tanks or cylinders.

Although not as energy efficient (at 75% efficiency) or cost efficient as the condensing boiler, combination boilers do require less of an upfront investment. Most organizations recommend that people choose a condensing boiler, and indeed building regulations in some countries now make this obligatory.

How do you know if you would benefit from a new boiler? If your boiler is old, especially if it is 10 years or older, a new boiler could well make great sense. But you don't need to try to work this out yourself. Many large, reputable heating companies offer free, no obligation boiler and heating surveys, and they can tell you how much you will save and exactly how much the installation of a new boiler will cost. You can easily sign up for a survey on-line, through a web-site such as <http://www.downwithco2.co.uk>.



Before you finally choose your new boiler you should think about a few things:

- **How big a boiler do you need?** How much hot water can satisfy the needs of your household?
- **Even though condensing boilers are the most expensive**, they are more efficient than other boiler types and in the long term, could save you the most money.
- **What will the boiler be used for?** Will it be used for space heating, or just hot water?
- **What type of fuel do you have available?** Wood, Natural Gas, Fuel oil?
- **After the boiler has been installed, who will take care of it?** Many companies offer maintenance contracts, and often these are a good idea.

When thinking about a new boiler, you should always make sure you are dealing with a reputable and qualified firm. Installers should be registered with an official organisation. This is especially true with gas boilers; in the UK you should always make sure your gas boiler installer is 'CORGI' registered.

In the UK, a new boiler can make even more financial sense because the government subsidises their installation, in order to promote energy efficiency. Your installer should be able to tell you about these subsidies, which apply to almost everyone in the UK, especially older people who qualify for even more money off a new boiler.

Finally, if you want to save energy and money off your heating bills, you should also think about having your home properly insulated if you haven't already. This is now very good value, and pays back the up-front investment in under 2 years. Further information can be found at <http://www.downwithco2.co.uk>



Chapter 4: Low Energy Lighting

Energy efficient lighting inside and outside your home can save you a small fortune on your electricity bills. It will also save you time and hassle, and help protect the environment by cutting the greenhouse emissions that you are responsible for. With the wide range on offer, and performance that is now much better than traditional bulbs, there are more reasons than ever to switch over. This article tells you how you can start saving money, and things to look out for.

If you were offered an investment with a guaranteed return of 900% a year or 10,000% over its lifetime, with no tax to pay, and which had a positive impact on the world, you would snap it up, right? Well this is the sort of return you can get by installing low energy lighting inside and outside your home.

Let's look at some of the figures. Energy saving bulbs now cost from around £1 each. If you replace a bulb that you use for around 3 hours a night, then you save about £9 a year on your annual electricity bill. Because they last much longer, according to the Energy Saving Trust each low energy light bulb can save you up to £100 in electricity bills over its lifetime. If you add up all the light bulbs and fittings in your house, this adds up a surprisingly large saving.

Plus the benefits aren't only financial. Something as simple as using low energy bulbs can have a big impact on your personal contribution to Climate Change, by reducing the carbon dioxide emissions you are responsible for. Each bulb on its own will save up to half a tonne over its lifetime. If you replace 10 old-style bulbs in your house that you use for 2 hours a day with low energy bulbs, you will save around a quarter tonne of carbon dioxide each year.

Finally, low energy light bulbs save you time and effort. Because they last around 10 times longer than normal bulbs, when you switch to low energy bulbs you won't have to get the ladder out so often to replace bulbs that have blown.

So why isn't everyone making the change to low energy bulbs? Sadly too many of us are creatures of habit, and just carry on buying the same bad bulbs we always have. But now with the wide range on offer, and recent developments which have made low energy bulbs perform just as well as old-style bulbs, it makes sense to change all your bulbs straight away.

It does take a little effort to make the switch at first. First you have to go round your house and write down a list of the bulbs you currently use – including wattage (60w, 100w etc.), type of fixture (screw, bayonet etc), size and colour (e.g. are they toned?)

Next you have to work out the wattage for a low energy bulb that matches the wattage of your current bulbs (for example a 20 watt low energy bulb gives off the same light as a 100 watt old-style bulb). You can find simple tables that can help you do this on the Internet at sites like <http://www.downwithco2.co.uk>.



Once you have worked out the bulbs you need to buy, you can then go shopping. There are many retailers of low energy bulbs on the Internet, or now they are commonly available in supermarkets or hardware stores.

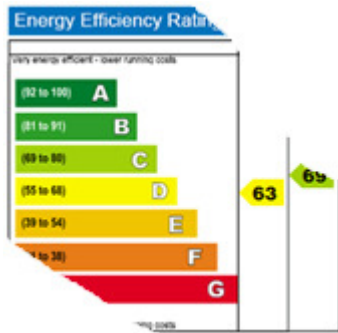
Plus you can also save a lot of money by installing more energy efficient lighting outdoors. Just a few outdoor lights left on each night can double your household lighting bill and your greenhouse gas emissions. The best solution is to fit daylight and movement sensors so outdoor lights switch on when they're needed, but don't waste electricity. This also improves your home's security, as you can tell when someone is approaching the house.

For outdoor lights that must stay on for long periods, use energy efficient, compact fluorescent or LED lamps and choose the lowest wattage lamp that gives enough light. In the garden, you can now buy solar powered garden lights that use no mains electricity and so produce no emissions when used. Plus you don't need to wire up your garden to get lighting.

So now you have seen all the benefits of low energy lighting, it really does make sense to make the switch as soon as you can.

Chapter 5: How to save big money on Fridges, Dishwashers, Washing Machines, Tumble Dryers

As well as shopping around for a bargain on the Internet, you can save a surprisingly large amount of money on your appliance by going for the most energy efficient models. The following article tells you how much energy and money you can save



Everyone likes to feel that they have got a bargain when they buy something new, particularly if it's something expensive like a fridge or washing machine. One tried and tested method is to shop around, and the Internet has taken a lot of the hassle out of this. You can now compare prices at several different retailers from the comfort of your own home. As well as specialist on-line retailers of domestic appliances, most high-street retailers now have an Internet site where you can check their prices.

However, when they are buying a fridge or washing machine, most people only factor in the up-front cost, and don't think about the cost of the electricity that it takes to run the appliance over its lifetime. And this can add up to a surprisingly large amount. In fact, sometimes the savings from an energy-efficient fridge or other appliance are so great, they will almost cover the cost of buying the appliance in the first place! So when it comes to replacing appliances, you can actually save the most money by buying an energy efficient model.

Take fridges and freezers, which are the hardest working appliance in your home. They are on all day, every day of the year. They can account for a quarter of your electricity bill. If your fridge or freezer isn't energy efficient, you could be paying through the nose. New energy saving fridge freezers use two thirds less energy than other models and can save you up to £45 a year on your bills. So when buying a fridge freezer, you should look for the most energy-efficient.

Dishwashers are now thought to have about the same environmental impact as washing up by hand. They use electricity, but use less water and water heating. The balance is tipped in the dishwasher's favour if you use an energy saving dishwasher. To run a cycle on an inefficient appliance costs around 16p but to run the same cycle on an energy saving machine will cost you only 9p. A difference of 7p per wash. Energy saving dishwashers use 40 per cent less energy which should equate to around £20 off the average electricity bill each year.

The average washing machine does around 1 wash every weekday, and wastes a very large amount of energy. Buy an energy saving washing machine and you can use a fraction of the energy of old energy-hungry models. Again this can



equate to a saving of around £20 from your electricity bill. The same applies to a tumble dryer, where the most energy efficient models will save you around £15 per year over standard models.

So all in all you can save around £100 a year on your electricity bills if you buy the most energy efficient appliances. Given that they last around 10 years, this will add up to around £1,000. Now that is some saving!

But how do you know which appliances are most efficient? Well, each model of appliance now receives a rating from the European Union for its energy efficiency. The EU energy label rates products from A++ (the most efficient/least energy used), down to G (the least efficient/most energy used). By law, the label must be shown on all refrigeration and laundry appliances, dishwashers, electric ovens and lightbulb packaging. In the UK you can also recognise the most efficient appliances because they are approved by the Energy Saving Trust, and have an 'Energy Saving Recommended logo'. Your on-line retailer should give you this information when you browse available models. If they don't, then try another one that does; there's plenty of choice.

Chapter 6: How to get your hot water straight from the sun

A solar hot water system uses the sun to provide part of your home's water heating needs. It can supply over half of your annual water heating, even in cooler climates like the UK. As well as saving you money on gas and electricity, it helps fight Global Warming by reducing the fuel you use. The following article tells you how to harness the power of the sun to heat your water and what to look out for when considering a solar hot water system.

Hot water straight from the sun may sound too good to be true, but even in the UK a solar hot water system can supply you with over half of your hot water needs over the year (the rest coming from a conventional gas boiler or electric heater). With recent high energy prices, and concerns about Climate Change, more and more people are looking to take advantage of this tried and tested technology to save energy in their home.

A solar hot water system works by capturing the sun's heat with solar panels fitted to your roof. This transfers the heat to a fluid, which in turn transfers the heat to a hot water cylinder to store the heated water during the day.

A surprisingly large amount of energy can be captured this way, even in cooler climates like the UK. Over 1000 kwh of energy is received each year in the UK on each square metre of surface. That's about 60% of the solar radiation found at the equator. Even on cloudy days we receive energy from indirect sunlight and this energy replaces the gas or electricity that would otherwise be used to heat water. Altogether this adds up to a big saving on fuel, and a big benefit for the environment. Each solar hot water system saves around half to three-quarters of a ton of carbon dioxide each year

Solar hot water is usually the most cost effective renewable energy system you can install at home, with a shorter payback than other options, e.g. wind or solar electricity generation. The payback is improved even more by the government grants that are available in the UK.



It is also a tried and tested technology that has been around since the 1970s. Very little maintenance is generally required for solar hot water systems. They normally come with a 10 year guarantee. They generally only need a basic check by you once a year and a check by a professional every 3-5 years.

Before you decide to move ahead with the purchase of a solar hot water system you need to check that your property is suitable. You will need 2 to 5 square metres of southish facing roof space (i.e. southeast, south, or southwest facing), that has little or no shading during the day. You may also need space to locate



an additional hot water cylinder if it is needed. Solar hot water systems generally work well in partnership with condensing boilers. They do not generally work well with combination boiler systems. Installation with these usually involves extra cost.

Installation costs vary due to factors such as size of the solar panels, type of roof, the existing hot water system and where your house is. The typical installation costs are between £2,000 and £5,000, although you can get several hundred pounds in grants from the UK Government to help with these. The cheapest systems are generally those based on 'flat plate collectors', which will cost between £2,000 and £3,000. Another type of system (an 'evacuated tube' system) generally costs £3,500 to £5,000, but needs less roof space to provide the same amount of water heating, because it is more efficient. An installer will help you decide which type of system is best for you.

If you are interested in installing a system, you should contact a reputable installer to carry out a survey of your home, and get a quote. They will be able to assess your property's suitability, advise you on which system is best, give you a quote and help you with grant funding. Before you can qualify for grant funding from the UK government for a system like this, you need to have already installed some basic energy efficiency measures in your home, such as low energy light bulbs, insulation and efficient heating controls.



About Downwithco2.co.uk

DownwithCO2.co.uk makes it easy for people to make big cuts in their gas or electricity usage. By signing up for five basic actions on the site, people can initiate actions that will reduce their home's carbon dioxide emissions by over 3 tonnes a year with little or no impact on their daily lives. This is equivalent to taking a car off the road for each home. Even taking one or two of these steps has a big impact.

In under 30 minutes, householders can set in motion the following five changes:

1. Install home insulation
2. Upgrade to a super-efficient condensing boiler
3. Replace light bulbs with low energy bulbs
4. Buy an energy efficient fridge, dishwasher or washing machine when the current one needs replacing
5. Install a solar hot water system

The site also features information and contacts for more advanced measures to reduce carbon emissions, such as solar electricity and ground source heat pumps.