

Bittern Countryside

Community Interest Company



Energy Fact Sheet 4.

New for 2021

“Avoiding energy waste”

Insulation and energy conservation

Save energy,

Cut your carbon footprint,

Save the environment!



Supporting the

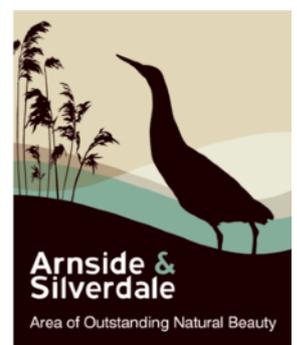
Arnside Silverdale AONB

Low Carbon Landscape Initiative

Bittern Countryside Community Interest Company
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Introduction

This is the fourth in a series* of booklets prepared by the Bittern Countryside CIC to help you understand renewable energy and see how you can reduce your carbon emissions and save money on your energy bills.

This is about **small** ways to help reduce your carbon emissions. The other fact sheets help you make bigger changes by looking at the way you heat your house and whether you can produce your own electricity.

** Fact Sheet 1 “Electricity From Sunshine” deals with PhotoVoltaic panels. Fact Sheet 2 deals with woodburning and multifuel stoves. Fact Sheet 3 deals with buying, using and storing wood. Fact sheet 5 deals with heat pumps.*

Why bother with small changes?

It is tempting to say that we can afford not to worry about things which only make a small difference to our carbon footprint but there are around 7,000 people in our AONB with an average annual carbon footprint each of 15 tonnes of CO². If each of us could decrease our carbon footprint by around 5% then that would be a saving of over 5,000 tonnes of CO² each year or the equivalent locked away each year by a mature forest 5 km by 5 km.

Here are the carbon footprints of some everyday objects

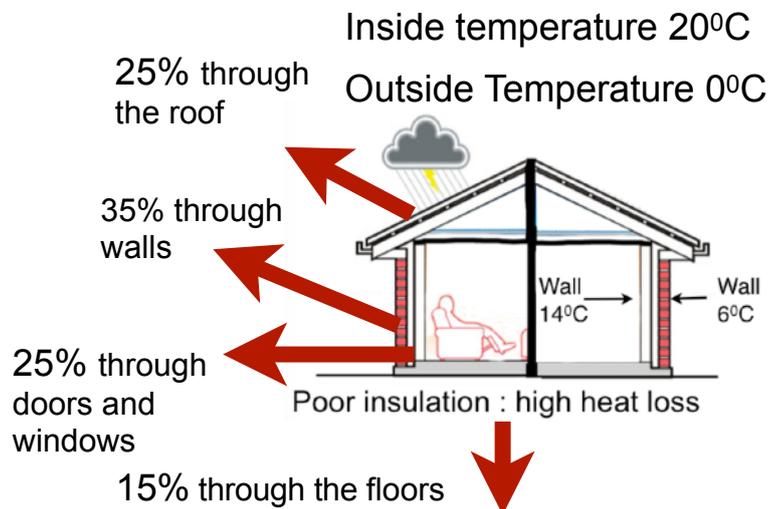
Item	CO ²	Item	CO ²
500ml tap water	0.1g	500ml bottled water	160g
1 banana	80g	1 imported punnet of strawberries	1.8kg
1 kg of carrots	300g	1 rose from Kenya	350g
1 mug of tea	53g	1 pint of beer	900g
1 pair trousers	3kg	1 kg of plastic	3.5 kg

Which ones could you do without or reduce your consumption of?

Insulation

Heating is probably the biggest user of energy in your house over the year.

It makes sense to try to keep most of that heat inside, where it is needed, rather than heating up the surrounding countryside.



Why should I insulate my roof?

A quarter of the heat lost from an uninsulated building is lost through the roof. Hot air rises in the house and this is quickly lost if your ceilings are uninsulated. It is very quick and easy to lay insulation between the joists of the attic of a house. You should however make sure that any electrical cabling is not buried in the insulation. Remember roof insulation should go over **not** under water tanks or pipes.

What materials can I use?

Sheep's wool insulation comes in panels, slabs or rolls that fit neatly between the joists. It is probably the best in terms of local sustainability in that you are using a local byproduct. It is also nice to handle and can be installed by the householder. Mineral fibre or fibreglass matting can be bought in rolls. This may be covered in a heat reflecting material to improve heat retention and make handling the material easier. Loose-fill loft insulation materials such as vermiculite, cellulose or mineral fibres can be poured between the joists. They are easier to use if the loft is obstructed or has awkward corners. Warmcel 100, a cellulose fibre insulation, is made from recycled newspapers and is fire retardant, non-irritant, non-toxic and safe to handle. For information about natural materials try www.naturalinsulations.co.uk A good web site for general information is http://www.diydata.com/projects/loft_insulation/loft_insulation.php

I use my roof space for storage. Can I insulate the rafters instead?

You can put rigid foam boards up under the tiles between the rafters.

Make sure though that you leave a ventilation space between the roof felt/

tiles and the insulation. Once again there is lots of information available on the web for DIYers.

Where can I get a grant?

The situation seems to change from week to week. The easiest place to get information is via the internet. You can always do this through the library. Your power company should also be able to give you information. You should certainly be able to get the work done at a subsidised price or in some cases free.

Why should I insulate my walls?

Heat will always flow from a warm area to a cold one. In winter, the colder it is outside, the faster heat from your home will escape into the surrounding air. Wall insulation slows down the rate at which it escapes, keeping as much of it as possible inside your home for as long as possible. How? Insulation works by coating or filling walls with a layer of material that only allows heat to pass through it very slowly. This reduces what is known as the U value of the walls – the rate at which heat can flow through them. The lower the U value, the more slowly heat is lost – and the more money you will save on your fuel bill to keep your home warm. Solid wall insulation also helps prevent “cold bridging”. Cold bridging occurs when a material that is a good conductor of heat makes a “bridge” between the warm interior and the cold exterior. This is a significant source of heat loss and can lead to condensation and mould forming in buildings.

How can I check if I am losing a lot of heat?

One way to check how much heat you are losing is to buy or borrow** an infra-red laser thermometer. They cost around £20. Choose a day when it is much colder outside than in. Find the internal and external air temperatures. Point the thermometer at the inside of an external wall and then at the outside of the same wall. Do the same for the windows and doors of your house. Make sure all the surfaces are out of direct sunlight. The bigger the difference between the inside ambient temperature and that of the inside surfaces or the outside ambient temperature and the outside surfaces, the more heat you are losing.

The following table shows the readings taken for a house in Arnside on a morning in February. The outside temperature was 3.5°C and the inside temperature was 19.5°C

Case Study	Inside: °C (difference)	Outside: °C (difference)	Heat Loss
Ambient temperature	19.5	3.5	
Cavity filled Wall	18.5 (-1)	4.5 (+1)	Low
Double glazed Window	17.5 (-2)	5 (+1.5)	Low
Wood external door	15 (-4.5)	7.5 (+4)	High

The wall is losing very little heat. The windows slightly more but the single skinned door is losing quite a lot.

What types of wall insulation are there?

First of all it depends on whether your house has cavity or solid walls. You can decide which yours is in several ways. Most houses built after 1920 have cavity walls. Those built after 1990 are likely to already have cavity wall insulation. You can measure the thickness of your walls. Those of around 260mm are likely to be cavity. Those that are much thinner or thicker are likely to be solid.

Are there any drawbacks to cavity wall insulation?

If your outer walls are very damp either from faulty damp-proofing or from penetrating rain then the insulation itself can form a bridge between the outer and inner walls and cause problems with damp on the internal walls. A reputable installer will check for this before he begins but you might want to look at your walls after a period of heavy rain before you decide. If your building is brick then once the holes drilled for injecting the insulation have been filled then they will probably not be noticeable. If your building is rendered then the filled holes will probably show. You might want to consider having the surface repainted afterwards.

What types of cavity wall insulation are there?

There are several types of cavity wall insulation. The most common at the moment is rock or mineral wool. Expanded polystyrene beads were very popular but the binding agent used can deteriorate with age and lead to the beads pouring out if any building work is carried out on the walls. Polyurethane foam is sometimes used. This sets immediately after it is injected by drying out through the outer wall. With all three it is important that they are used correctly.

We live in a semi and our neighbour doesn't want to have cavity wall insulation. Can we do our own house?

Yes. The installer will put a cavity barrier in place which will prevent the insulation entering your neighbour's cavity.

What about solid wall insulation?

This is more expensive to do and can also be much more intrusive. However it can also provide much greater savings of energy. It is usually not a job for the amateur and it is beyond the scope of this booklet. However one of our members has had good results by lining his walls with Sempatap before papering them. A good first stop for more detailed advice would be the Energy Saving Trust website at <http://www.energysavingtrust.org.uk>.

How can I minimise heat loss through my windows?

Double glazing is very effective and triple glazing is even better. If you can't have double glazing, think of secondary double glazing or, if your walls are very thick, internal shutters that fold back in the window rebate. You could also try external shutters. These can keep your house cool in summer as well.

Why are most radiators sited in front of windows?

In single glazed houses, siting the radiator just below a window heats the very cold air descending from the internal face of the window and thus stops a layer of very cold air forming at floor level. In addition the area in front of a window is usually free from furniture so the heat from the radiator can circulate more easily. Now most houses have double, or

even triple, glazing there is less heat loss from the window area and radiators are often placed against inside walls. However it is best not to have them on the wall opposite to the window as this can set up a current of air that can feel draughty.

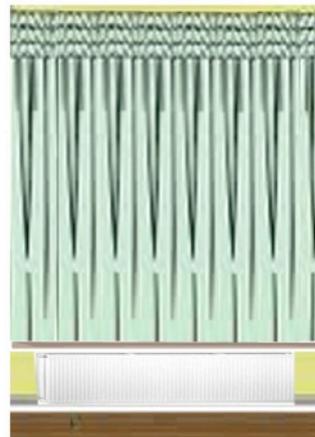
Should I pull my curtains at night?

Thick lined curtains can reduce heat loss from windows dramatically. However it is important that any radiators under the windows are not trapped behind the curtains.

Pull Those Curtains But:



Long curtains that hang in front of a radiator are a major cause of energy loss.



The curtains should not hide the radiator when drawn and there should be a shelf above the radiator to deflect heat back into the room.

Can I block the air vents into the house?

If you have a woodburning stove or gas appliance you will need some form of ventilation. Do not block up any vents used for this purpose. Extractor fans and tumble driers should have flaps that only allow air to pass out and not in.

Can I block the air vents under the floor to retain heat

You should never block vents that provide air under the floor. There are 2 reasons for this. Firstly the air flow is necessary to stop the floor timbers rotting or becoming infested with woodworm. Secondly the AONB is a high risk Radon*** area and good underfloor ventilation will stop the Radon gas seeping into your house.

How can I stop draughts?

Double glazed windows should not allow draughts but ill-fitting doors often allow air to enter. There are lots of foam strips on the market that can be used to make the door airtight. Your letterbox is often a draught hotspot. Make sure you have a flap both inside and outside. A porch or lobby can also be a big help in keeping heat in the house, acting as a sort of airlock.

Why should I lag my hot water cylinder?

Even modern cylinders can benefit from an extra layer of insulation around them. You don't want the heat from the tank to escape into the air. Make sure the extra lagging does not cover the thermostat.

Should I use a dishwasher?

This is a difficult question. The perceived wisdom is that dishwashers save money and energy but this is only the case if you use them for everything. If you wash glasses, pots and pans, tins and plastic recycling by hand anyway then you will save energy and water by using a bowl of soapy water for everything and rinsing under a slow running tap or in another bowl. The waste rinsing water can then be used to water tubs and plants. Also if you have solar hot water then you will probably save energy by handwashing as most dishwashers only take cold water and heat it by electricity. Lastly if your dishwasher breaks perhaps you should factor in the amount of energy and water needed to build one and ship it round the world before you decide to buy a replacement.

How else can I save energy?

Most ovens use around 1 kWh once they are up to heat. Why not invest in a slow cooker or a Remoska if you are often cooking for one or two people. A standard slow cooker will cook a stew for 4 people using under 0.7 kWh in total. This includes the energy to brown the ingredients first in a frying pan and then 5 hours in the slow cooker. This is much less than the total energy needed to cook the same dish in an oven. A Remoska can also be used to roast, grill and braise.

What about lighting?

We all know about turning off lights when they are not needed. Energy-efficient lighting helps lower electricity usage without reducing the quality

of light in our houses. If you replace all the bulbs in your home by LEDs you could reduce your carbon dioxide emissions by up to 40kg a year. You can also get LED security spotlights for outside your house. For more information go to <https://energysavingtrust.org.uk/advice/lighting/>

How can I measure the electricity I use?

The best way is with a smart meter. These are available free from most electricity suppliers. An alternative is to buy a single 13 amp meter that plugs into your socket and measures the power used by anything plugged into it. Either way you need to look at them frequently.

Make sure your condensing boiler is working efficiently

If you have a gas condensing boiler, the condenser, which helps save energy by using the exhaust gases, will not turn on if the water return temperature from the radiators is over 45°C. There can be a 6% drop in efficiency when running the system at 70°C out /50°C return instead of 50°C/30°C. Most manufacturers suggest you run your boiler at the lower temperature in all but the coldest weather. There is a dial on most boilers which allows you to choose. It might be worth while investigating.

If you find you can use the lower temperatures all winter even when the weather is very cold then you will not need to replace your radiators if you decide to install an air source heat pump later on. Remember this is the radiator water temperature not the hot water which needs to be at 60°C to avoid Legionella.

Don't expect to wear a t-shirt and flip flops all winter in the house.

Running your central heating so the house is around 19°C rather than 21°C or 22°C will be healthier for anyone who is moderately mobile as well as saving energy. Turning down your thermostat by 1 degree C can reduce your carbon footprint by 300kg a year. Wear warm slippers and put on a fleece if you feel cold.

Does saving water also save energy and money?

Energy is used in providing and purifying the water we get from our taps. The more we can reduce our mains water consumption the better. Firstly think about water you use in the garden. A water butt linked to the

downspout of your guttering will provide most of the water needed in a garden. If you have a large garden then several butts may be needed. These can be linked together so all the rain is collected. Outhouses and sheds can also be used as water collectors. Have a shower rather than a bath and fit a water saver to the shower head. (This only works if you have a shower of less than 10 minutes. Those who sing the whole of the first act of 'Carmen' in the shower should stick to baths!!) If you have a bath on a cold winter day leave it to cool down to room temperature before you empty it. That way you will be using the heat to warm the air rather than wasting it.

Use your washing machine and drier less frequently.

It is all too easy to put everything we wear in the washing basket each night whether it is dirty or not. Even the most efficient washing machine uses both water and heat as well as detergents. Clothes should only be washed when dirty. This will also reduce the amount of microplastics ending up in Morecambe Bay.

Fix any dripping taps.

A dripping tap can waste up to 5,500 litres of water a year. If it is a hot tap the carbon footprint is much higher. Make sure your taps are properly turned off and change washers when taps start to drip. Report any leaks outside to United Utilities at 0800 330033 or online.

Consider having a water meter fitted. This way you only pay for what you use and can reap some of the benefits of saving water. For more information go to <https://www.unitedutilities.com/my-account/all-about-water-meters/>

If we all work together we can help reduce our carbon footprint and help preserve our AONB from the ravages caused by climate change. If you have found this helpful please pass it on to a friend to read. All the fact sheets are available free of charge on our web site.

Can I really make a difference?- a case study by the Kitchens.

Some years ago Ken and I decided to make real efforts to reduce our carbon footprint. The following shows what we did and the results in terms of energy usage and hence carbon production.

Action taken each year

Electricity (kWh)

Year 1

4,269

Replaced some bulbs by LEDs, used slow cooker more, turned off standby lights.

Year 2

3,712

Year 3

3,846

More LEDs, bought energy efficient freezer, used low energy dishwasher cycle.

Year 4

3,233

Bought energy efficient fridge.

Year 5

2,914

Solar PV installed, used immersion heater rather than boiler all summer and when sun shone in the winter, used appliances whenever solar PV was generating.

Year 6

2,292

Gas (kWh)

Year 1

23,187

Log burning stove used on winter evenings. Improved roof insulation, central heating thermostat down by 1°C

Year 2

20,126

Year 3

19,761

Insulated under floor with sheep's wool.

Year 4

15,936

Cavity wall insulation with white rockwool, used 30°C clothes wash.

Year 5

14,228

Year 6

10,388

Log burning stove used more often. Central heating thermostat down to 19°C, used immersion heater so very little gas used to heat hot water.

Our gas consumption has gone up again by about 2,000 kWh as we now use our woodburning stove much less often. They have a mixed press at the moment as poorly installed and used they can give off particulates. In a rural area the advantages of using a renewable resource would seem to outweigh the very small increase in particulate matter. Burning dry wood is essential.

However as you get older woodburning stoves take more effort to run.

Where did the CIC get its information from?

It is drawn from recognised official websites, publications and practical experience - email:info@bitterncountrysidecic.org.uk for more information.

Where can I find more information? (Neither the AONB office nor the Bittern Countryside CIC are endorsing any of these.)

- The Energy Saving Trust on www.energysavingtrust.org.uk will give impartial advice on a whole range of measures to reduce your energy use.
- Second Nature UK limited will give advice on wool insulation. They produce Thermafleece insulation and also EdenBloc³⁵ rigid insulation see www.Thermafleece.com
- Details on Sempatap can be found at www.mgcltd.co.uk/Products/Thermal_and_Acoustic_Insulation/SEMPATAP_THERMAL/
- You can find out about Slow Cookers and the Remoska at Lakeland Ltd. www.lakeland.co.uk

** We have a laser thermometer available that can be borrowed from the AONB office. Just email info@arnsidesilverdaleaonb.org.uk if you would like to borrow it for a couple of days.

*** What is Radon and how can I find out more about it?

Radon is a colourless and odourless gas that comes up from the bedrock in our area. It tends to be channelled through cracks in the limestone so one house may have a high radon reading and its neighbour a very low reading. High levels of radon are thought to cause lung cancer so it is wise to keep the reading as low as possible in your house. More details can be found on www.phe-protectionservices.org.uk/radon run by the Health Protection Agency, a government sponsored body.

