Energy use and efficiency at home and in other buildings: What can we do?

This leaflet has resources and links to accompany the presentation with the same name given by Nicola Terry (nicola

Local resources for Cambridge

Open Eco Homes – allows you to visit homes with energy saving measures and get a tour. This is run on 2 weekends each year. This year it will be 18th and 24th Sep.
http://openecohomes.org/

Transition Cambridge have help sheets on central heating, insulation, ventilation, damp and mould, solar panels, wood stoves, and more, also a personal checklist
http://www.transitioncambridge.org/faqs

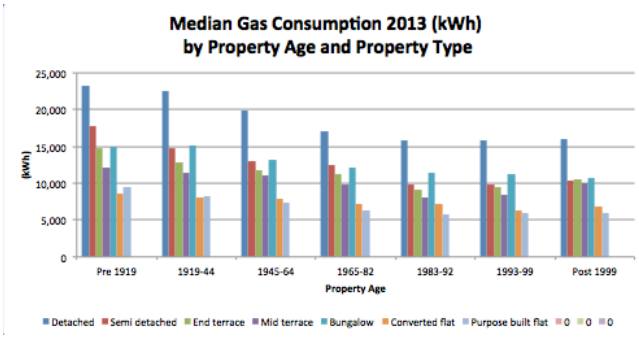
My website (including electricity use calculator, living with low carbon technology guides, home heat loss model
http://nicola.qeng-ho.org/

Comparing your energy use with others

National Energy Efficiency Data Framework
NEED

Your energy company may be giving you this service already but they are very vague about how they identify 'similar' customers and it is not clear how large their sample is. NEED is a national database with many thousands of homes, cross referenced with energy bills, dwelling characteristics and energy measures installed.

The *Table Creator* allows you to tabulate energy use by characteristics including house size, age, type, region, tenure (owned/rented) and number of adults living in it. Here is an example.



They also have a small dataset with *anonymised record level data* for statistical analysis.

Pathways to sustainable energy

Strategy	Examples
Reduce waste	Insulate/draught proof your home. Avoid over filling the kettle. Turn things off when you have finished using them.
Increase efficiency	Be sure to buy efficient appliances (see energy labels below). Install a condensing boiler Use a wood stove rather than an open fire.
Reduce service	Have a smaller TV or fridge. Adjust your heating thermostat and your radiator valves
Use low carbon energy	Switch to a green electricity supplier. Install solar panels/biomass boiler.

Planning/Audits

Get a personalised checklist
www.transitioncambridge.org/faqs
(Getting Started)

Ask Cambridge Carbon Footprint for a thermal imaging survey (or get trained in how to do your own and borrow their camera yourself).

Visit homes that have had measures installed during OpenEcoHomes. This is run on two weekends each year.

Energy Performance Certificates
An energy assessor can survey your home and give you an EPC (Energy Performance Certificate). This rates your home as to how much it would cost to heat and run with a standard heating regime and gives it an A-G rating. It also recommends measures you could take to improve it and estimates how much you would save.

These estimates are based on standard assumptions for heating regime, hot water use and electricity use based on household size estimated from the size of your house. It does not take into account your actual household size and habits.

Further advice from
moneysupermarket.com

For an in depth discussion of how the assessment works, and why it isn't always accurate read buildingsheriff.com

kW and kWh

kWh is energy (the units you see on your biills)
kW is power – the rate at which you use energy.
1 kWh = 1 kW for 1 hour.
Typical household use is 8-10 kWh/day

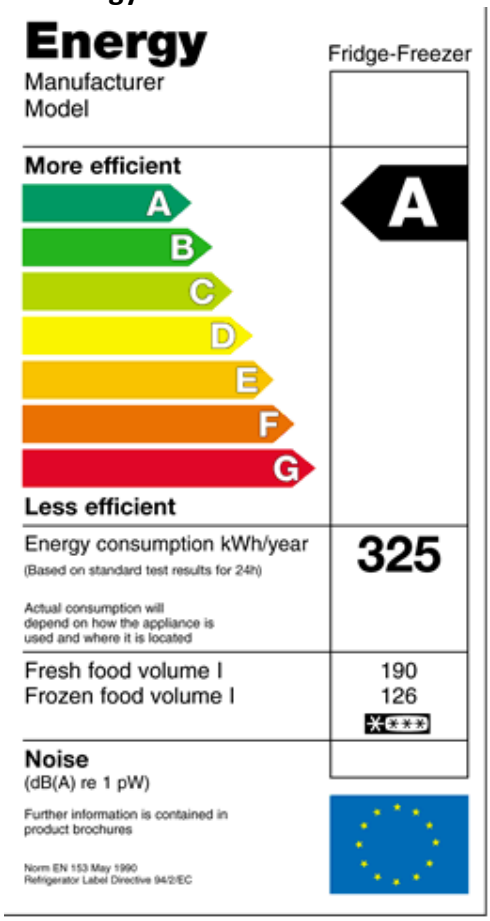
Appliances and energy labels

Most efficient appliances
The Energy Saving Trust maintains a list of the best appliances in various categories at www.toptenuk.org

Energy star
www.eu-energystar.org

The Energy Star programme is a voluntary energy labelling scheme for office equipment including computers, and printers. Unlike the energy labels there is only one level of Energy Star qualification – it either is or it isn't. However, the qualifying level of efficiency improves over time.

EU energy labels



Washing machines, tumble dryers, dishwashers, fridges and freezers and now televisions and light bulbs all have energy labels. This gives each appliance a rating comparing its energy use to other similar appliances – of similar size and functionality. 'A' is not necessarily the best. For many appliances 'A++' or even 'A+++' is now available.

The energy labels also gives the estimated energy consumption, usually in kWh/year. A smaller appliance with a worse rating can still use less energy.

See also Which? Energy labels explained

EU Ecodesign
EU Energy Efficient Products

EU Ecodesign rules specify minimum efficiency levels for some appliances. For example old fashioned light bulbs are being phased out under eco design rules.

Grants

Cambridgeshire Home Improvement Agency
www.cambridge.gov.uk/about-cambs-hia
Grants and loans for home improvements for people who are disabled, elderly, vulnerable or on a low income.

Action on energy
http://www.actiononenergy.net/
Advice to householders and landlords on energy saving grants in Cambridgeshire.

Energy Companies Obligation
This is a national scheme whereby energy companies fund energy saving measures for qualifying households.

OFGEM has information about the grants and a list of suppliers you can contact who could help.

The eligibility rules are very complicated. Being in receipt of benefits is part of it – you must be getting at least one of the following:

- State Pension Credit
- Child Tax Credit (relevant income £16,010 or less)
- Income-related Employment and Support Allowance
- Income based Jobseekers Allowance
- Income support
- Working Tax Credit (relevant income £16,010 or less)
- Universal Credit

See Affordable Warmth Group Guidance Note

Insulation

Advice on insulation on the Transition Cambridge website.
www.transitioncambridge.org/faqs Insulation

Historic England has in depth (and somewhat alarmist) guidance on issues to consider when insulating homes with solid walls. Since Cambridgeshire is just about the driest part of the country some of the warnings given are not so relevant here.

Renewable Energy

Green Energy Suppliers
Switching to a green energy supplier may not cost you as much as you think. For a medium use household (3100 kWh/year) the extra cost compared to the *best* Big Six deal was about 20p/day. The main suppliers are Ovo Energy. Ecotricity and Good Energy. See We Love Green Energy (Transition Cambridge blog post).

Generating your own energy
OFGEM has advice on subsidies for generating your own renewable energy

Feed in tariffs	electricity e.g. solar electricity panels. (photovoltaic, PV)
Renewable Heat Incentive	heating e.g. biomass boiler or a heat pump. It also applies to solar hot water panels.

To find out how much you could generate from solar electricity panels (without getting a quote) try the PVWatts calculator http://pvwatts.nrel.gov/ This works for the UK too. It will give you an estimate of how much you can generate month by month, based on system size, tilt and orientation taken from a satellite image of your roof (or entered manually).

National resources

Yougen is an excellent resource for tips on both energy saving and renewable energy.
www.yougen.co.uk

Yougen is managed by the National Energy Foundation.

Background information

Energy use statistics
Facts on domestic energy use – Department of Energy and Climate Change:
Domestic energy fact file and housing surveys

Energy Consumption in the UK – annual statistics on energy use: overall, transport, domestic, industrial, services
Energy Consumption in the UK

Passivhaus standard
Passivhaus homes are so well insulated and so air tight that you don't need a traditional heating system. Ventilation is usually mechanical ventilation with heat recovery and heating is often integrated with that. This is the main website.
www.passivhaus.org.uk

Wimbish is a nearby social housing project built to Passivhaus standard
www.wimbishpassivhaus.com/

There are some interesting blogs about the experiences of living in a Passivhaus at Green Building Store

Discussion points

What do you want to/need to/actually know about how you use energy in your home? How would you find out?
Do you know how much you use for cooking, space heating and water heating? Do you know how much energy your dishwasher, washing machine and tumble dryer takes to run? To find out, consider:
Reading your meter (monthly?, weekly?, daily?)
Get a smart meter or use an energy monitor (whole house). For electrical appliances try a plug in monitor.

Tips and gadgets for energy saving
What do you use or would most like to have? Here are some examples of gadgets currently available: Intelligent heating controls. Energy monitors – get to know how much you normally use and notice if it is higher then usual. Automatic sleep mode on computers and displays. Smart plugs. Eco kettle allows you to heat just the water you need. Shower timer, low flow shower-head.

What tips can you give? Here are some: Close curtains at night. Adjust the heating timer to turn off a little earlier. Give your children responsibility for energy saving and encourage them to nag you about it. Don't run hot water a little bit at a time especially if you have a combi boiler – wait until you have a sink full of washing up.

Could you do your own energy audit?
The Transition Cambridge energy saving checklist could give you a start. Do you need to know full costs and savings before doing anything? Would you trust a professional audit more? Would you pay £20? £50? £500?

How much of your house do you heat? Is this controllable?
Where is your thermostat? Is it in a place that you want to keep warm? Do you use different parts of the house at different times of the day? If so, do you have separate controls for those rooms (e.g. radiator valves). Are they accessible? How long does it take for the room to heat up after you turn the thermostat up?

How warm do you need to be for health? How warm is comfortable?
Government advice has changed: we used to be advised to heat to 21C but now 18C is regarded as generally adequate for health, even for elderly and vulnerable people provided you wear suitable clothes. Are you comfortable at that temperature? What do you do or could you do to keep comfortable when the weather is cold? Hot drinks? Baths? Run around? Put on a hat? Put your feet on a hot pad?

Energy saving versus heritage features.
Is it important not to damage the material of period features (like mullion windows, cornicing, panelling…) or is it OK to rebuild them after adding insulation (e.g. new window frames with thermal breaks, new cornicing…)? Should people living in period homes expect to live a modern lifestyle or should we strip out the central heating and wear overcoats indoors? You may find it hard to find consensus on what is acceptable change and what is not. Who should decide?

Should your energy company help you save energy? How?
Many energy companies now give advice on energy saving. However, they make more money from you if you use more not less. They will say they want to help you because you are important as a customer. Where would you prefer to get good advice from, that would be convenient and believable?