Cool It!

The best options if you want to buy a fridge which saves you money and emits less pollution.

Machynlleth, Powys SY20 9AZ UK **Tel.** + 44 (0)1654 702400 **Fax.** + 44 (0)1654 702782 **email.** info@cat.org.uk **Website.** www.cat.org.uk

Introduction

Refrigerated food is a luxury which we now take for granted. Most households have fridges, freezers, or both, and most diets include foods such as dairy products, fast foods and ice cream, which don't survive for long at normal room temperature. While we may see fridges and freezers as benign tools quietly doing their job, like most electrical appliances there is an environmental price to pay for the service they provide. This tipsheet tells us what the pay-off is and how we can help to reduce the impact of refrigeration.

How refrigeration works.

Inside a fridge is a coil containing a refrigerant – a liquid that boils and evaporates at very low temperatures. The liquid in the coil is drawn into a compressor, and when compressed it evaporates into a gas and heats up – drawing this heat from the air inside the fridge. The hot compressed gas then pumps round to the element at the back of the fridge where the heat is given off to the air, and the gas condenses to a liquid. The liquid is then allowed to expand and return to the inside of the fridge, and the cycle starts again. In this way the air inside the fridge is kept cool, (and is why the back of your fridge is warm).

The history of refrigeration

Mechanical refrigeration was developed at the end of the 19th Century, using sulphur dioxide and methyl chloride as the coolant. These are very toxic chemicals and after several accidents where the gases leaked, scientists came up with a chlorofluorocarbon refrigerant known as 'Freon 12'. This non-toxic gas became the standard, and fridges and freezers using Freon became widely available from the 1920s and 30s. Mass production got underway after World War Two. It was many years before it was discovered that this use of chlorofluorocarbon, or CFC, was endangering the earth's protective ozone layer.[1]

CFCs

Chlorofluorocarbons (CFCs) are environmentally damaging because they destroy the ozone layer, allowing more harmful ultraviolet radiation to reach the earth. They also contribute to global warming. By 1986 a quarter of all global CFC production was being used for refrigeration. Production and consumption in European countries was phased out by 1995, a year before the required phase out in developed countries under the Montreal Protocol[2]. CFC's should be phased out globally by 2010. However, even so, present levels of CFCs will continue to destroy ozone in the upper atmosphere for up to 100 years.[3]

Alternatives to CFCs

In the EU the use of Hydrochlorofluorocarbons (HCFCs) in new fridges has also recently been banned because they too are ozone depleting. Hydrofluorocarbons (HFCs) have been promoted instead as they do not harm the ozone layer. They are, however, powerful greenhouse gases – at least 1,200 times more powerful than carbon dioxide (CO2) and so contribute to global warming. Although HFCs are not ozone depleting and hence not covered by the Montreal Protocol, the UN Convention on Climate Change has proposed a range of targets to reduce emissions of six greenhouse gases, including HFCs, in EU countries by 2008.[4] Many new fridges still contain HFCs, and it is always worth checking with their manufacturer, especially as fridges can be labelled CFC free (which they have to be anyway, by law), even though they are environmentally damaging.

Hydrocarbons as refrigerants

In June 1992, Greenpeace commissioned 10 prototype hydrocarbon (HC) fridges. The 'Greenfreeze Fridge' was an environmental, manufacturing and public relations success story[5], and recently, in the UK, Iceland have launched the Kyoto range of fridges and freezers using 'Greenfreeze'. Natural hydrocarbon gas is less harmful, has no effect on the ozone layer, less impact on global warming (3-4 times more powerful than CO2 but nothing like HFCs – which are 1,200 times more powerful as a greenhouse gas), is more energy efficient than CFCs and HFCs and is non-toxic. Commonly a mixture of propane and butane, HCs are now used in the production of many new fridge and freezer models. They are widely available as an alternative to HFC fridges, from, among others, Iceland, Bosch, Siemens, Liebherr, AEG and Neff.

Energy consumption

Fridges and freezers are probably the most expensive domestic electrical appliances to run, accounting for approximately 25% of the average household bill.[6] In the UK households spend £1.2 billion every year on cooling and freezing food – almost as much the electricity consumption of all office buildings. Replacing an old inefficient fridge with a new, energy efficient model could save up to £45 a year on your electricity bill, and will reduce your environmental impact too.[7]

Energy labelling

Since January 1995, all fridges and freezers on display must carry the standard Energy Label (as specified by the EC Energy Labelling Scheme). Recently updated, the original classification system has been reduced from A-G to A-C (A grade being the most efficient). Most models are graded A or B. These ratings are decided by the manufacturer, and although they can provide the buyer with important information, a survey by Which? magazine in October 1997 found that over half of the 20 models they tested used more energy than the letter classification claimed[8]. For an independent energy award scheme, the recent EC 'Energy +' rating[9] is given to those models that exceed the 'A' class energy use criteria, using up to 50% less energy than the average appliance.

The EU Ecolabel

The EU Ecolabel[10] has a flower and stars symbol and accompanying text ('This product qualifies for the EU Ecolabel because it is energy efficient, safeguards the ozone layer and has minimised contribution to the greenhouse effect'). To qualify, an appliance must be graded 'A' or 'B' for energy efficiency, use HCs as refrigerants and in the insulating foam, have identified and labelled components for recycling, have a noise level not exceeding 42dB (chest freezers are excluded from this category), and provide accompanying information on minimising

Pictured: The European Community Ecolabel Logo

environmental impact in the instruction manual. The EU Ecolabel has, to date, been awarded to Vestfrost of Denmark, whose model is currently unavailable in the UK due to lack of UK demand. It is worth contacting their head office to find out more and if this will change in the future.

Frost-free

Many new fridges available are 'frost-free' and may use on average 30% more energy (to deliver the additional service)[11], so it is better to choose a conventional fridge, though you will need to defrost it yourself – a good opportunity to see what's lurking in the back!

Efficient cooling

The amount of energy a fridge or freezer uses doesn't just depend on the appliance itself – easy steps can be taken to make it as energy efficient as possible.

- When buying a new appliance, do not buy one that is bigger than your needs. Fridges and freezers work most efficiently when ¾ full.
- Chest freezers are more efficient than upright ones as less of the cold air escapes when opened.
- Make sure there is lots of space at the back and on top of your fridge or freezer to allow circulation of air.
- Keep the coils at the back dust-free as accumulation of dust on condenser coils can increase energy consumption by up to 30%.
- Site the appliance in a cool place, away from cookers and boilers and out of direct sunlight.
- A fridge thermometer is useful to check the thermostat is not on too high a setting. Fridges should be 0°C to 4°C; freezers ¯18°C to ¯6°C.
- Cool and cover foods before putting them in the fridge or freezer.
- Replace damaged door seals – they let the heat in – and make sure the door is always kept closed.
- DIY insulation around the sides of the appliance will help keep the inside of the fridge cool and so save energy – but never cover the coils at the back.
- Defrost regularly.
- Buy a Savaplug. When a fridge thermostat switches on the motor to pump the refrigerant around the system, full power is required for the motor to start. However, after the appliance has got over this initial surge of electricity, Savaplug adjusts the flow of electricity to match the requirements of the fridge or freezer, thus reducing electricity consumption by up to 20%. It is recommended for old and new fridges and freezers, although all freezers and older fridges will benefit most in energy saving, Savaplugs are available from CAT Mail Order (Tel 01654 705959 for details).

Changing your electricity supplier to a green supplier using renewable sources, like wind or hydro, is also a very worthwhile long-term option. Contact the Information Department at CAT for details (tel. 01654 705989).

Disposing of your old fridge

Up to three million fridges are disposed of in Britain every year. New EC legislation requires that from January 2002, all CFCs are recovered from discarded fridges, including from the insulation foam. Although this is obviously a good thing, the UK at present has no specialised facilities to remove these materials so disposal may become more difficult. From 2002 new EU legislation on Electronic waste will be implemented, holding manufacturers responsible for the re-use, recovery and recycling of their products. However if manufacturers and retailers won't offer a trade-in when you buy a new fridge, your local authority should collect your old one, though they make a charge if they have to collect it. There may be grants available to offset some of the cost of buying a new energy efficient fridge to replace your old one – contact your local energy advice centre for details.

Repairs and recycling

Several manufacturers have been improving their spare parts policy, so it is easier to get your fridge repaired. The industry is also making recycling of parts easier with companies coding their plastic components to simplify sorting and some will accept their old appliances for recycling. It is a good idea to contact the manufacturer of your old fridge before you buy a new one to see what service they offer. Calor Gas has a reclaim policy for its hydrocarbon refrigerants and will reprocess or incinerate depending on their state. A re-furbishment & re-use service for your old machine for individuals or families on low income may be provided in your area; contact Wasteline for details.

Best Buys

Ethical Consumer Magazine[12] recommended the following as 'Best Buy models', with minimal environmental and social impact:

Fridge-freezer (one of the Energy + models)
Electrolux: ER8199B / ER7225C / ER7535D
AEG: Oko Santo Super 2373-6KA /
Oko Santo Super 2374-6KG /
Oko Santo Super 2590-6DT
Individual fridge or freezer – Any A-rated appliance.
Miele is recommended for overall best buy.

There is also a list of Energy Efficiency Recommendations of A-rated products including fridges, freezers and fridge-freezers available from local Energy Efficiency offices – see below for details.

Alternatives to Refrigeration

Before modern refrigerators were widely available food was kept cool in cold stores or larders. Some older houses still have larders, and it is also perfectly possible to build a new one. While today we would probably have a refrigerator as well, a cool storage area can be a useful addition for vegetables, drinks etc. A larder is usually on the north-facing side of the house, insulated from the house's heating system, ventilated to the outside at the top and bottom, and with a large thermal mass (usually stone shelves and floor) in order to maintain a regular temperature.

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Contacts

CAT Information Department	01654 705989	www.cat.org.uk
AEG Customer Services	0870 535 0350	www.aeghome.co.uk
Siemens	0870 240 0070	www.siemens.co.uk
Bosch	0870 240 0060	www.bosch.co.uk
Neff	0870 240 0080	www.neff.co.uk
Liebherr	0197 766 5665	www.lhg.liebherr.de
Elelectrolux	0870 595 0950	www.electrolux.co.uk
Zanussi	0870 595 0950	www.zanussi.co.uk
Vestfrost Head office	0184 435 2906	n/a
Comet Customer Services	08705 425 425	www.comet.co.uk
Dixons Customer Services	0870 154 5560	www.dixons.co.uk/
Energy Efficiency		
Advice Centres	0800 512 012	www.est.org.uk
Friends of the Earth	0207 490 1555	www.foe.co.uk
Greenpeace	0207 865 8100	www.greenpeace.org/
Save Waste & Prosper	0113 243 8777	www.swap-web.co.uk
Iceland Customer Services	0124 483 0100	www.iceland.co.uk
E.C.Institute	0186 528 1180	www.eci.ox.ac.uk

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