



Energy Saving Fact Sheet | **Heating**



Making business sense
of climate change

Turn up the heat on your energy costs

You can't avoid the costs of heating your buildings to a comfortable level or providing hot water, but you can minimise them – whatever type of heating system you have. In fact, it's possible to shave a third off your heating costs, provided you take the right approach. This practical fact sheet will help you identify areas for improvement and money saving.

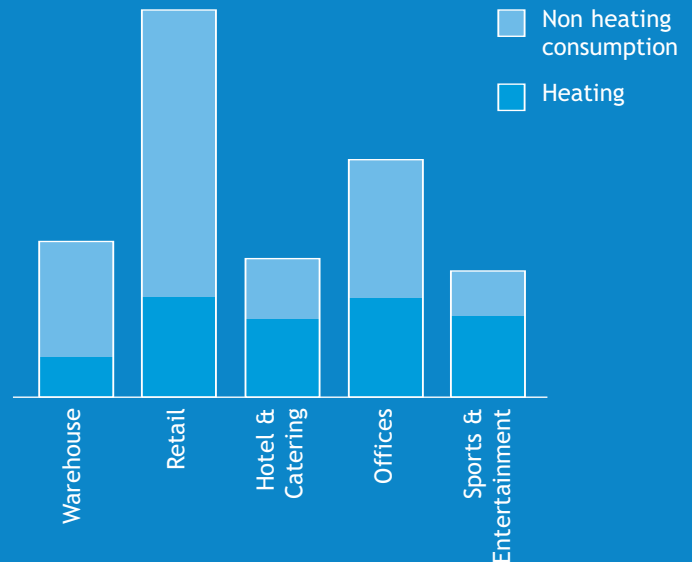
Energy wasting hot spots

The chart below gives you an idea of how energy is used in certain sectors. For hints on reducing energy costs, call the Carbon Trust on 0800 085 2005.

fact:

Heating and hot water can account for up to 60% of a building's energy costs. But a lot of this is wastage. Often, companies don't understand their systems or ensure that they work efficiently. And they make their buildings too hot.

Breakdown of heating energy use in a typical commercial or industrial building



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Commercial buildings

Radiators, air-handling units and electric heaters are the most common methods of heating in commercial buildings.

- ▶ **Turn it down.** If you have radiators, fit thermostatic radiator valves (TRVs) and set them to the minimum comfort level. It's a fact – lowering room temperatures by 1°C can reduce your annual heating bill by 8-10%. If you have expensive electric heating, add timers and thermostats and check the settings regularly.
- ▶ **Care for boilers.** Service your boilers every year – they will be more efficient and last longer. Insist on a combustion report each time: efficiency improvements after the service can be seen as reduced flue gas temperatures and increased carbon dioxide.
- ▶ **Manage your fans.** Turn off your air-handling fans when there is no demand for ventilation and use locally situated thermostats.

Industrial buildings

These include new retail 'sheds', warehouses and factories with large airy spaces that can be hard to heat – often using unit or radiant heaters. To reduce costs:

- ▶ **Think locally.** Not every area has to be heated equally. Where people are more active – you can usually set the temperature lower for comfort. Check areas that seem particularly hot or cold and add controllers and timers. This will help improve morale and productivity.
- ▶ **Stay safe.** Ensure heaters are unobstructed. Radiant heaters can become very hot, so mount them at a safe height and control them using 'black bulb thermometers' located in direct 'line of sight' of the heater.
- ▶ **Spend to save.** Fit 'interlock' controls in workshops to switch off heating when doors are open. Consider replacing any electrical heating with a gas or oil-fired system.

What kind of heating system do you have?

Use this section to identify the heating system in your building. This is the first step to knowing what specific measures you can take to minimise running costs.

Are there radiators? If so, the heating system also usually has a boiler, pumps and distribution pipework.

Is the circulating air warm? You will either have air-handling units that deliver warm air through ducts (and possibly unheated or cooled air during the summer) or unit heaters that use fans to distribute warm air around the building.

Do you only have electricity on your site? Then you are probably using local electric heaters or a ventilation system that heats the air. Both of these solutions are often expensive to run.

Do your heat emitters get very hot and glow red? These are radiant heaters. They are good at creating comfortable conditions when internal air temperatures are low, and they are ideal for large areas with poor insulation or for providing local 'spot heating' in wider open spaces.

Do you have discrete units pushing hot air into the space occasionally? These are quite common in industrial buildings and are called unducted warm air systems.

Hot water systems

Providing piping-hot water, whether it's distributed centrally or locally, is costly. Follow these practical money-saving steps.

- ▶ **Stop heating the air.** Check the insulation around pipework and water tanks, and replace any damaged or missing sections. After all, you don't want expensive heat leaking out.
- ▶ **Keep control.** Establishing the right levels can pay back handsomely. Install time controllers to hot water boilers, immersion heaters and any circulating pumps. Make sure they are set to provide hot water only when it is actually needed. Don't literally boil your water: you can safely set thermostats to store water at 60°C and deliver it at around 56°C.
- ▶ **Don't pay twice.** If you have a centralised system and a boiler which already provides hot water, turn off any immersion heaters.
- ▶ **Separate your water heating.** If you have a single boiler that provides hot water *and* heating, consider using a separate, smaller boiler for the hot water. This will allow you to switch off the heating boiler in the summer.
- ▶ **Consider 'point of use'.** Where you need a small amount of hot water a long way from the central water storage, it is often more effective to heat this locally using electric point-of-use heaters. However, make sure these have adequate temperature and time controls so that they are not left on unnecessarily.

Know your heating system

Here's how a typical heating system works. It is useful to understand the process and be aware of the components, so that you can see where energy savings can be made.

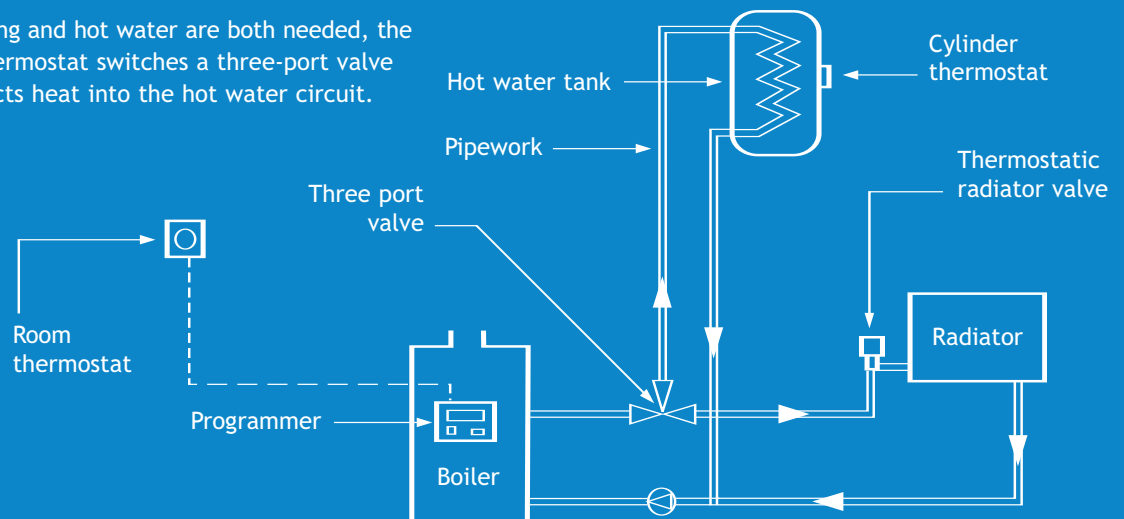
The programmer dictates when the heating or hot water can receive heat from the boiler.

If the temperature falls below a set threshold, a thermostat (room or cylinder) 'calls' the boiler and starts a pump. Once at temperature, the thermostat stops calling for heat and the boiler and pump switch off.

When heating and hot water are both needed, the cylinder thermostat switches a three-port valve that redirects heat into the hot water circuit.

Once the hot water is at the required temperature, the valve switches back to the heating circuit.

Thermostatic radiator valves (TRVs) give greater flexibility by controlling the heat flow through individual radiators. However, they should not be used in the same space as a room thermostat.



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Time controls

Controls offer good opportunities for savings. Time controls are useful to reflect building occupancy and eliminate unnecessary operation.

- ▶ **Set simple time controls.** Don't over-complicate things: allow adequate pre-heat time to let the building reach temperature just before occupancy.
- ▶ **Use seven day timers.** Where occupancy varies throughout the week, seven day timers can ensure that heating is only available when it is needed.
- ▶ **Install optimum start controls.** These automatically adjust heating start up times so that the building reaches temperature to coincide with occupancy. They are cost effective, but the start and end times need to be actual occupancy times.

Temperature controls

These help to avoid overheating, creating a better working environment.

- ▶ **Don't overdo it.** Heating should meet but not exceed comfort or process requirements.
- ▶ **Site thermostats carefully.** Ensure they are situated away from draughts, direct sunlight and heat sources such as radiators and office equipment.
- ▶ **Add TRVs.** Individual thermostatic radiator valves are useful for maintaining a consistent comfortable temperature in areas that suffer from under or over-heating. Don't adjust them from minimum to maximum though – they should not be used as on-off switches.
- ▶ **Advanced options.** Other controls include weather compensators. These reduce the water temperature in the heating circuit on mild days.

Take action!

Start saving energy today

1. **Turn heating down** rather than opening doors and windows. Reduce room temperatures by 1°C and you can cut heating bills by 8-10%.
2. **Look out for draughts** especially around poorly-fitting windows and doors. Installing draught proofing reduces heat losses *and* increases staff comfort.
3. **Investigate area temperatures.** Investigate areas that appear cold or too hot and consider localised thermostatic controls.
4. **Check insulation levels** and increase them wherever practical to reduce the need for heating. This also reduces the possibility of the building overheating in the summer.
5. **Encourage staff involvement** and ask people to report any heating problems so they can be solved.

Call the Carbon Trust for a FREE Energy Awareness Pack.

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General housekeeping – top tips

Radiators. Fit thermostatic radiator valves (TRVs).

Electric heating. Electricity is expensive, so ensure that electric heaters are only used when required, by fitting time switches and thermostats.

Controls. Check timers and temperature controllers regularly to ensure they match occupancy and activity patterns.

Maintenance. Service boilers annually and ask for the report on the combustion efficiency. This should show an improvement after the service.

Hot water. Set time controls to match when hot water is needed.



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The Carbon Trust helps businesses and public sector organisations cut their energy costs to combat climate change through the provision of free, professional advice and assistance.

Want to find out more?

There are useful energy-saving guides at www.carbontrust.co.uk/energy or by contacting the Carbon Trust on 0800 085 2005.

GIL159 *How to improve your building fabric*

GIL155 *How to control heating costs at work*

GPG132 *Controls for wet heating systems in small commercial and multi residential buildings*

The Carbon Trust has many more tips on improving your heating that will help you save energy and money. So give us a call.

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