

Space Heating

Between 50-70% of the energy use in schools is for space heating. Space heating is usually from a central boiler house which provides heat to radiators. In temporary accommodation, electric storage heaters or electric convectors may also be used. In rooms where, due to a lack of maintenance, existing radiators may have become less effective due to air locks etc, plug in electric heaters may be in use. There are plenty of ways to save money whilst reducing heating energy use and maintaining comfort.

Top tips

- Read the gas/oil meter regularly.
- Keep track of fuel bills or your fuel meter if you have one.
- Ensure staff members know how to use thermostats and thermostatic radiator valves.
- Talk to staff to find out which areas are too hot or too cold.
- Make sure your time clocks are 7-day timeclocks and are set to the correct time and day of the week, with correct on-off times.
- Eliminate local electric heaters by repairing the main heating system.
- Consider replacing your boiler if it is more than 20 years old. Old boilers can have a seasonal efficiency as low as 60%. New boilers can have a seasonal efficiency as high as 90%.

No cost measures

Prepare an energy management plan. An energy management plan will allow you to set targets for energy consumption against previous consumption figures. Get the students involved as well to promote energy awareness. Download the Energy in Education Guide, workbook and student energy logbook at www.energyineducation.ie.

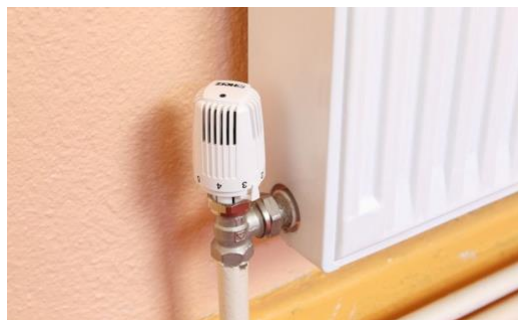
- Keep close track of fuel use. If you use natural gas, read the meter monthly and phone or upload the readings to the gas utility (see your gas bill) to avoid over or under-charging. The gas utility will typically read the meter 3 times per year.

- Track your fuel use on a spreadsheet available from www.energyineducation.ie. Electricity can also be tracked.
- Close doors and windows. Ensure all windows are closed at the end of each day to retain heat for the following day. This is especially important during weekends and holidays. Make sure someone is responsible for closing windows in each room.
- Time switches - Ensure time switches are set to the correct time of day and day of the week and are 7-day time switches. A 7-day time switch is one which can be set to different on/off times for each day of the week. Remember to update them twice every year with the shift from summer to winter time and back if they do not do this automatically.
- Are thermostats fitted? Do they work? They should be set to 18 degrees.



Typical Room Thermostat in School

- If you have thermostatic radiator valves (TRV), don't use them as on/off switches. Adjust them to a mid-position and if you are too hot or cold, only adjust them a small amount. Do not turn the TRV off, because the following morning the room will not be able to heat up. It is not practical for caretakers to go around a school daily checking TRVs in offices. Note: TRVs are not recommended for rooms used by students, as they can be accessed, and the controls adjusted inappropriately.



Thermostatic radiator valve

- Experiment with switch-on/off times for heating to see if later start and earlier stop times are possible.
- Has the school had new wall or attic insulation fitted recently and have the times been adjusted to take account of this? Is the weather milder now, such that the boilers come on later?
- If the school has a building management system (BMS), it monitors temperatures and it should calculate the best time to start and stop the heating. In these cases, the time settings should be regarded as hours of occupation, not boiler on and off times. You might set the times to 8:45 a.m. to 2 p.m. and the boiler will come on and off to maintain comfort during these hours. The BMS will recognise when insulation is improved. If you finish early on a Friday be sure to allow for this also.
- Does the school principal or caretaker know how to use the central heating system, the BMS, time clocks etc.?
- Do you need a manual for your storage heater or time clock? Missing manuals can often easily be found on the internet or are available from the manufacturers. Just look for the make and model of on the unit, and search on the internet for these, plus "manual" and "PDF". Most schools would have been provided with Operation and Maintenance Manuals when they were built (included in Health and Safety files). Do you know where these are, and has anyone looked at them, especially the first few pages?



Typical Storage Heating Controls (left) and 7-day time-clock (right)

- Do all radiators work properly? Are some radiators on all of the time or off all of the time? Are local electric heaters being used to compensate for faulty radiators?
- Radiators which always remain cold at the top are probably air locked, and can easily have the air bled off. The school should be able to do this themselves. A plumbing wholesaler will be able to supply a suitable bleed valve key. The bleed valve is at the top of the radiator.



Avoid using electric radiators

- Turn down the radiators in the corridors and toilets to a low setting or set associated thermostats to a lower level than classrooms. These are areas of intermittent occupancy so temperatures can often be reduced without causing discomfort. Monitor fuel bills for reductions.

Low cost measures

- Radiators which remain cold in the middle of the bottom of the radiator may be silted up. A plumber should be asked to come in during the summer to flush out radiators so they work properly.
- Repair or replace missing insulation. Repairing / replacing missing pipe insulation has a payback of around one year.



Repair damaged insulation

- Install wall thermostats so staff and students are aware of temperatures. Being aware of temperatures will increase awareness of energy waste. Perhaps the boiler can be turned off earlier in the afternoon?
- Have a plumber check to see if the "weather compensator" in the boiler house is working. (Small schools may not have one. Almost all larger schools with older heating systems do). Repair may be necessary.



This is a weather compensator valve that has been disabled with a piece of string. As a result, the schools fuel bills will be up to 10% higher.

- Fit pre-formed valve blankets around all but the smallest valves in the boiler house. Valve blankets may be held in position with Velcro or straps.



Fit valve blankets

Medium cost measures

- Existing heating system controls can be inefficient. Upgrades are well worthwhile as they can pay for themselves through energy and cost savings.
- Consider replacing old boilers. The older the boiler, the less efficient it is likely to be. New boilers are likely to be up to 20% more efficient than boilers which are more than 15 years old.
- Fit a monitoring and targeting system to the heating system to enable the fuel usage to be tracked automatically. The electricity meter and water meter may also be monitored automatically in this way. Newer schools will already have such systems.
- Consider zoning the heating system so that different areas can be on and off at different times.



Zone heating manual over-ride controls panel

- If upgrading the boiler system, have your consultant review the potential for changing to natural gas or LPG. Both are cheaper than oil. Both make it easier to install the most efficient types of boilers. The end result is lower operating costs and lower fuel costs. Another advantage is that natural gas and LPG are not subject to theft, whereas oil is subject to theft.

Helpful hints

Do – Have your boiler serviced and flues or chimneys cleaned at least once a year by a reputable firm.

Do – Have your thermostats and weather compensator checked once a year to ensure they are working.

Do – Keep track of your fuel deliveries in order to track fuel savings or fuel wastage.

Do – Read the manual on how to operate your storage heaters correctly (if your school uses these).

Do – Purchase your fuel and electricity via the Office of Government Procurement.

Don't – Cover radiators or allow new furniture to cover radiators or block the front of radiators.

Don't – Ignore stuck radiator valves. Get them repaired.

Don't – Open windows to control temperatures when heating is on.

Don't – Use thermostatic radiator valves (TRV) in any room or corridor accessible to students.