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Department
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Introduction

Energy and water are major non-staff costs in schools and a major part of a schools' environmental

impact. Some schools will have greater scope for savings than other. However more than 20% of energy is wasted and fuel bills can be reduced by 10% by simple good housekeeping alone.

These tips will help you to:

- save money, year on year
- create a healthier and more comfortable school environment
- reduce demand on finite resources
- have a positive impact on climate change by reducing emissions of carbon dioxide from energy use

1. Educate staff and children to turn off water and energy-using appliances when not in use

Start with the basics, such as switching off lights and electrical equipment when not in use. Many schools have groups of 'eco-champions', who check at the end of each day for equipment or lights that have been left on, switch them off and inform the staff responsible.

Recognise success. Where monitoring shows that a difference has been made, celebrate and help to maintain enthusiasm for going further.

2. Use the building systems properly

Using existing heating or lighting controls effectively can reduce energy wastage, save money and reduce emissions by up to 40%.

You can get advice on ways to save energy from:

- your local authority or a local controls expert who will be able share simple building management techniques
- the installer of the building management system - their name is usually on the boiler and heating control panel
- the company that installed your heating or lighting system to make sure that you are using it effectively

You can also find advice in your display energy certificate advisory report. Since January 2013 public buildings are required to show a valid Display Energy Certificate (DEC) indicating the actual energy performance of a building. These certificates are accompanied by an advisory report. The report contains:

- recommendations for improving the energy performance of your buildings
- a range of possible improvements, including cost effective measures that may improve the energy performance of the property
- zero and low-cost operational and management improvements
- possible upgrades to the buildings or services
- opportunities for the installation of low and zero carbon technologies

Use this information to improve your energy management, reduce consumption and CO2 emissions..

The report categorises recommendations, by payback period:

- short term payback (up to 3 years), for example building energy management measures
- medium term payback (3 to 7 years), for example upgrading building services
- long term payback (more than 7 years), for example low and zero carbon technologies

Each category includes the energy assessor's selection of the most suitable improvement measures for the building, generally between 5 and 10 measures.

You may be able to get funding to help you carry out works. For example, interest free loans for energy efficiency work are available through the Salix Energy Efficiency Loan Scheme.

3. Share information with pupils and school staff

Encourage and reward ideas and activities that will reduce energy use. Many school energy schemes have been created and are managed by pupils, making the most of their enthusiasm and creativity.

Teachers can bring energy information into lesson plans, most obviously within science or maths lessons. Engaging pupils with meter readings, energy management statistics and comparisons of numerical data helps them to:

- improve numeracy skills
- develop their own understanding of energy and how it is used

This can influence longer-term behaviour both at school and in the home.

There are additional resources for pupils and staff available at Eco Schools and National Energy Foundation Energy Envoys

4. Upgrade heating controls

Make sure heating, ventilation and lighting controls:

- are working properly
- provide a comfortable environment for teaching and learning
- match actual occupation times

Teaching staff need to know how to adjust the temperature, ventilation and lighting in their classroom.

Staff and pupils may need different temperatures to be comfortable, particularly children with mobility or health problems.

Children generally perform better than adults when temperatures are on the cool side.

Reducing the temperature in a building by 1ºC will save 5% to 10% of the heating bill. Operating the heating systems for an hour less each day will save a similar amount.

Modern heating controls are accurate, tamperproof and have the facility for 7 day programming. Heating can be set to operate at different times of the day or week and take account of holiday periods.

See Annex 2I Controls of the ESFA Generic Design Brief for a summary of suggested controls for primary

and secondary schools.

5. Use energy efficient lighting

Lighting accounts for around half of the electricity used in a typical school. You could reduce your consumption by:

- installing lighting controls, which are often very economical
- using occupancy lighting sensors in areas that are infrequently used
- replacing failed lamps with more energy efficient ones, which last longer

In many cases, older 38mm diameter fluorescent tubes (T12 now discontinued) can be replaced directly with 26mm versions (T8) which use 8% to 10% less electricity.

Where whole light fittings are being replaced consider using 16mm fluorescent tubes (T5), compact fluorescent lamps (CFL) or light-emitting diode (LED) types. LED lights use less energy than fluorescent lamps but need careful specification. Use the Annex 2E Daylight Electric Lighting of the ESFA Generic Design Brief to ensure that any new lighting will provide a quality lit environment and save energy over the long term.

Daylight and occupancy linked lighting controls per luminaire can save significant amounts of lighting energy in reasonably day lit rooms (up to 80%) but cost benefit calculations need to be done to ensure capital costs can be justified.

6. Use your meters for energy monitoring

Many schools have sub-meters installed. Since the 1990s, building regulations have required sub-meters to be installed to monitor at least 90% of the loads in a school.

There are options of how to use your existing sub-meters to monitor different energy end uses, including:

- manually reading the meters
- connecting to the existing building management system
- using the inbuilt transmission capabilities of meters

Automated meter readings can take place at specified time intervals, providing information on patterns of use and levels of demand when buildings are unoccupied. The data they provide can be used for teaching and learning.

Monitoring meter readings is a low or no cost measure that provides the capability to monitor energy end uses.

Many schools have recently had smart meters installed on their main incoming gas, electric and water supplies. These provide information about how much energy is used and when. This will help you to understand your energy use and how it can be reduced. If you have a smart meter learn how to use it.

You can compare your school performance to ESFA benchmarks across the main energy end uses of:

- lighting

- small power
- heating gas
- kitchen gas

There are tools to help you.

[Annex 2H Energy of the ESFA Generic Design Brief](#)

Provides good practice benchmarks for energy end use and guidance on the best way to monitor your energy end uses.

This describes:

- how new ESFA schools are required to describe themselves using the iSERV methodology
- the benefits of monthly energy management reports

You can use these to target energy saving measures in areas where there is most energy wasted and are likely to be most cost effective.

iSERV is also suitable for existing schools.

Further information on the [K2n National Database and iSERV continuous monitoring and benchmarking](#) is available.

[Chartered Institution of Building Services Engineers (CIBSE)](#)

CIBSE offer an energy benchmarking tool for all building users.

It will take performance data from a number of sources and:

- provide benchmark figures for a variety of building types
- enable building owners and designers to compare their consumption

Future developments will include an interface to view an individual owner's portfolio of buildings and how they perform compared to similar local buildings. Data updates will be anonymous and made via the web interface.

7. Manage information and communications technology (ICT) loads

The use of ICT in schools is growing rapidly. ICT equipment not only uses electricity directly, but often places further demands on electricity needed for lighting and cooling. The electricity used by ICT can be significantly reduced by selecting energy efficient equipment and enabling power management features. Rooms with interactive white boards should be set up to allow users to quickly and conveniently manage blinds and lighting. Energy use can be reduced by using free ventilative cooling rather than relying on air conditioning at times of the year when it is cool enough outside. Payback on free cooling can be less than 2 years.

For further information read the [energy efficiency of ICT equipment](#).

8. Improve insulation

Draught strip windows and doors. This is one of the most effective ways of saving money and improving comfort. Depending on the time of year, the gap between a door or window and its frame can vary by 3mm. On a standard door this is a hole equivalent to a house-brick. Draught stripping solves this problem.

Insulate hot water pipes, keeping runs of pipe work short, and lagging pipes properly. Lagging pipes saves energy and reduces the risk of pipes freezing in the cold months.

Lag ventilation ducts that act as cold bridges to outside.

It is also possible to obtain more environmentally friendly insulation. Speak to your local authority or purchasing consortia for advice.

9. Consider renewable energy

Small-scale renewable energy systems are pollution-free and will help to reduce energy bills. They can also generate interest in energy efficiency amongst pupils and provide a valuable teaching resource.

Renewable energy systems that can be appropriate for schools include:

- wind turbines
- biomass
- solar heat and power
- heat pumps

You may need approvals to install equipment on the land and buildings. Different tenures or controlling interests can affect how you can use the land and buildings. You should also consider potential liabilities associated with leasing out part of the premises or structure.

Find out more about land and building tenures.

10. Understand your bill and energy use

Energy use in school buildings is very much under the control of the individual school. You should know how much electricity you use, alongside other fuels for heating and hot water.

Understanding your energy bills will help you:

- check they're accurate and based on actual meter readings
- understand if energy usage is up or down compared to previous years

You will also be able to use your Display Energy Certificate, produced annually, to:

- compare your energy use to national averages
- see how energy use has changed from the previous year

The amount you pay for electricity may depend on when you use it. Using off peak (night time) electricity through timers and reducing peak demand can save significant amounts of money.

When you receive a bill, check it to make sure that it reflects the correct tariff.

Check your energy consumption to see if it seems reasonable for the:

- time of year
- severity of the weather
- consumption of water related to the number of people

Think about having an energy audit done.

11. Water economy measures

Water is a scarce resource and costs are rising rapidly. A school that is equipped with water conservation devices may use less than half the amount of water used in other schools.

Installations such as cistern dams, urinal controllers, flow restrictors and self-closing taps save water and money. They are all proven, simple to apply and economical.

12. Check for and repair water leaks

Underground leaking pipes can mean a huge loss of water, which will cost your school money. Check your water meter regularly.

If you suspect a leak, take a meter reading last thing at night when everyone has gone home and first thing in the morning before everyone arrives. If the reading has changed, indicating consumption, this is likely to be a leak.

Ask your local water company about their free leak detection service.

Find out more about energy and water management.

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