

Involving pupils in reducing your school's energy consumption

Reducing your school's energy usage will have both financial and environmental benefits, and in many schools is likely to improve the learning environment for pupils. To achieve lasting results a whole-school approach is essential, with the involvement of the senior leadership team, governors, site staff, teachers and pupils. For more information on whole-school energy management please see the document '[Schools: Learning to improve energy efficiency](#)' produced by the Carbon Trust.

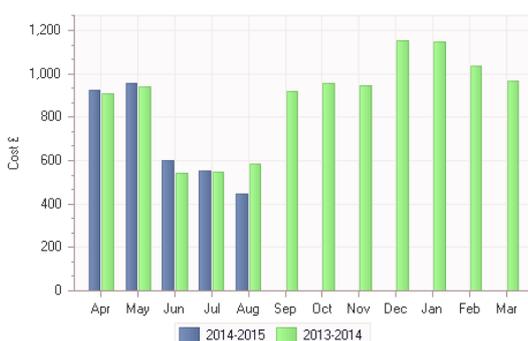
'Energy' is an essential topic when working for an **Eco-Schools Green Flag**, and one where pupils of all ages can work alongside school staff to achieve measurable results.

The main area in which pupils can have a significant impact is by influencing the **behaviour** of adults and pupils. Pupils of all ages will enjoy doing 'detective work' to see if lights, whiteboards and appliances have been left on unnecessarily, and reminding their friends and teachers to switch them off. When the school's heating is switched on, pupils can be made responsible for checking that doors and windows are not left open. Depending on your school's heating system, they may also be able to monitor classroom temperatures and ensure that thermostatic controls are used to ensure optimum temperatures for learning.



There is potential for linking energy monitoring to statistics / data handling work in mathematics, at both primary and secondary level. Work on energy / climate change can also be integrated into science, geography and citizenship teaching at KS2 and KS3. Resources for use in curriculum work are listed in section 4.

'Goodbye' meter readings; 'Hello' Web Reports!



In the past to keep track of your energy usage it was essential to take regular meter readings. With the installation of automatic meter readers (AMR) in schools, life has just got a LOT easier! Most school utility meters now automatically send a meter reading via the mobile phone network every half hour, and the data is available in online Web Reports which Business Managers, teachers and pupils can access at the click of a mouse!

To check which meters in your school have AMR installed ask you Site Manager or Business Manager. Each school has been sent log in details to access the Web Reports – your Business Manager should know these. If you have difficulty tracking down any of this information contact Kelvin at the Council's Energy and Water team: Kelvin.Newman@brighton-hove.gov.uk. If you would like your own log in details Kelvin can arrange that for you.

You can easily find your way around the Web Reports, referring to the Council's instructions which can be downloaded from the Wave:

<http://wave.brighton-hove.gov.uk/supportingyou/facilities/energyandwater/Documents/WebReportsGuide.pdf>

You will find a wide range of charts and tables which analyse your energy (and water) usage, many of which can be customised according to different periods. More details about some of these charts are included on pages 3 and 4.

Running a pupil-led energy reduction campaign

A pupil-led campaign to reduce your school's energy use is the perfect Eco-Schools project, and can result in significant changes in people's behaviour. A reduction in electricity usage of 10% is usually achievable through simple behavioural change, and some schools achieve significantly more. For example, the table below shows the results from a small primary school that undertook a 4 week campaign involving the whole school in switching off lights and appliances that were not needed.

	baseline	final	% change
average day time usage kWh (9am to 3pm)	51.54	43.37	-15.9%
average out of hours usage kWh (3pm to 9am)	50.98	42.55	-16.5%
weekend usage kWh (Fri pm to Mon am)	139.78	112.80	-19.3%
total weekly usage kWh (Fri am to Fri am)	604.83	503.70	-16.7%

The pupil team

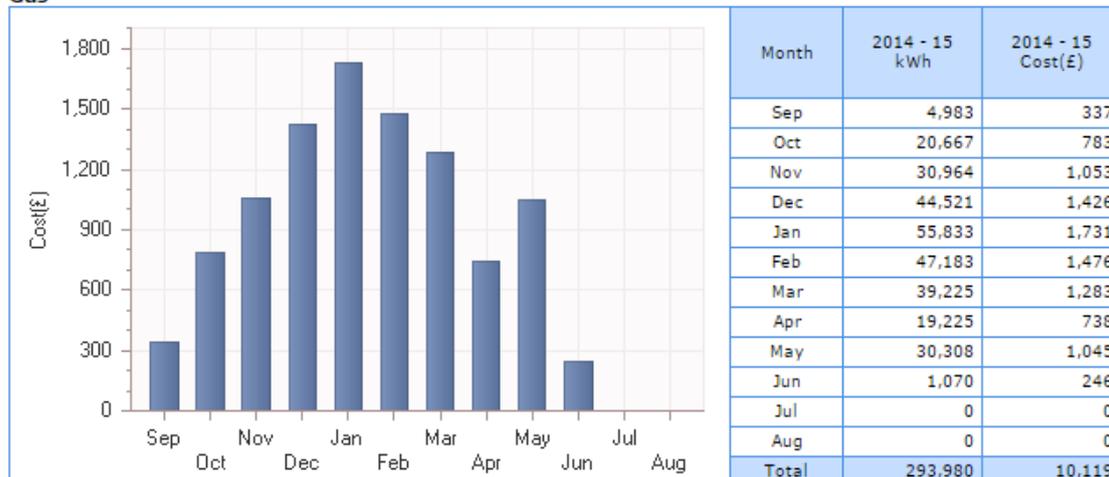
In most schools an energy reduction campaign will be led by the Eco Committee, made up of pupils of different ages, and key adults from the school such as the Business Manager and Site Manager. In larger schools a special Energy Team can be selected, while some smaller primaries choose to designate a class to take the lead.

The pupils in the team need to be 'energy experts' so they can engage others and spread key messages through the school. At a level appropriate for their age they will need to know **why** reducing energy usage is important. Issues to explore before they launch the campaign to the rest of the school may be:

- how burning fossil fuels contributes to climate change through the greenhouse effect
- the impacts of climate change on people and animals both locally and globally
- the increasing costs of energy – Web Reports will show you how much your school spends on gas and electricity each year (see below for example graphs and tables from a local primary school.)

It is essential that pupils feel positive and empowered to take action based on what they have learnt. For useful resources to turn you pupil team into 'energy experts' see section 3.

Gas



Campaign structure

A typical structure for a pupil-led energy campaign is:

- i. Baseline monitoring
- ii. Agreeing targets and action planning
- iii. Publicity to the whole school
- iv. Taking action
- v. Post-campaign monitoring
- vi. Celebrating success

Before you start

Before you launch a pupil-led campaign, you will need to consider:

Senior Leadership Support

It is essential to have the backing of your SLT before undertaking an energy-reduction campaign. Ensure they understand the benefits to the school, both financial and educational, and that they will support your team's plans and decisions. Discuss the time needed for you to co-ordinate the campaign and for the pupils to meet. For example, you may well need pupils to be allowed out of class for meetings, and you are likely to need some non-contact time to ensure the campaign, and its follow up, is effective.

Timing

Electricity and gas usage are influenced by the weather and time of year, both in terms of temperature and light levels. You cannot control completely for weather fluctuations, but ensure that your baseline and post-campaign monitoring periods take place during the same season. You should also avoid conducting monitoring when usage is atypical (e.g., during Christmas celebrations or exams).



Once you have decided upon your base-line and post-campaign monitoring periods, you will know how long you have for your energy reduction campaign. There are advantages to keeping this fairly short and intense (for example Energy Month, as promoted by the Pod and Eco-Schools), but some larger schools prefer more time to get everybody involved.

Electricity, gas or both?

Some schools plan separate campaigns focusing on electricity and gas usage, while others combine the two into one high-profile energy reduction campaign. Decide which is best for your school, taking into consideration the age of your pupils, the size of your school, and the amount of time your team has to plan and run the campaign. In many cases it is most effective to concentrate on a simple message with a really high profile throughout the school.

Running your campaign

a) Baseline monitoring

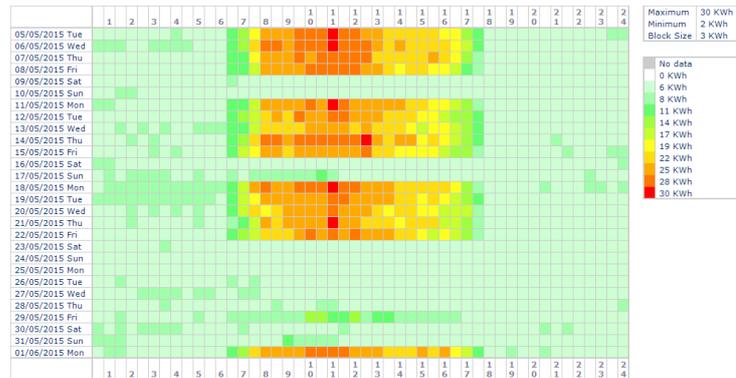
Before you start your campaign it is essential to get a picture of how much energy the school is using and the areas for potential saving. There are two ways to involve pupils in doing this: using Web Reports and carrying out some in-school 'detective work'.

The Web Reports allow pupils and adults to visualise how much electricity and gas the school is using, either in terms of kWh or pounds spent. Which reports you use will depend on the age / ability of your pupils. We particularly recommend the following:

Web Reports: AMR Footprint

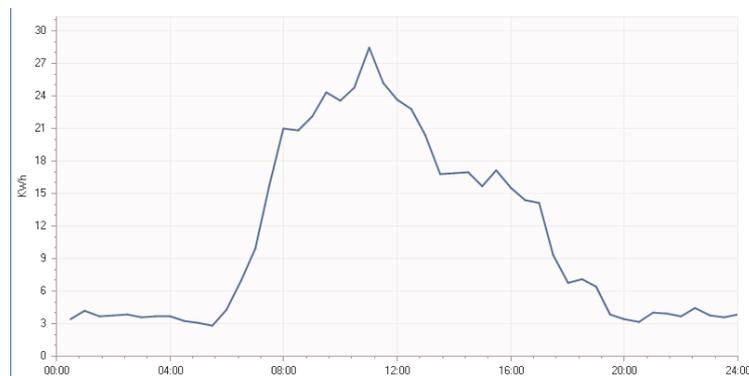
This graph shows a month of gas or electricity usage, divided into 30 minute segments. The date is shown vertically, and time of day horizontally. Warmer colours represent higher usage. The example below shows electricity usage in a Brighton & Hove primary school; it is easy to see at a glance how usage drops during the half term break.

The footprint graph is very useful for spotting out of hours usage, both overnight and during school holidays. Reducing this wastage can significantly reduce a school's bills.



Web Reports: Line graph

The Web Reports also allow you to look at the detail of each day's usage with line graphs. These can be used to tell the story of your school's energy use, and look for peaks and troughs as usage varies through the day.



Web Reports: Schools Campaign 2 week comparison

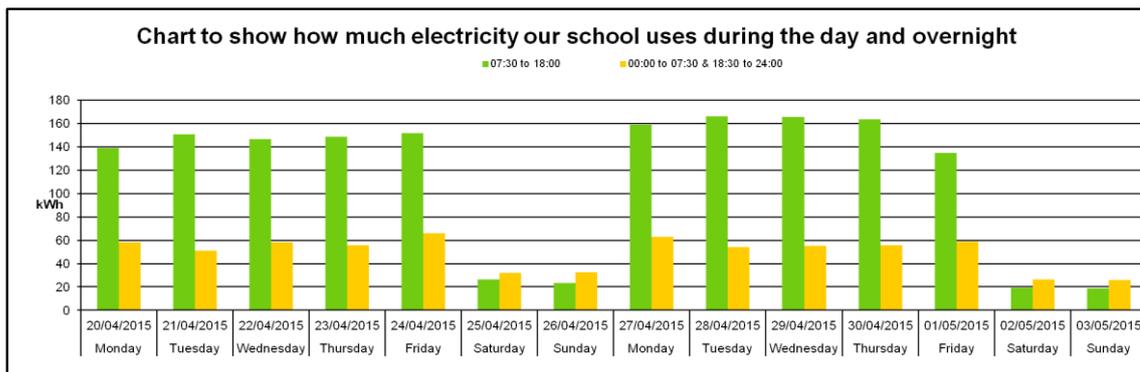
Data downloaded and available for analysis:		
Start date	Sun	01-Sep-13
End date	Tue	01-Sep-15
Enter the dates you want to analyse in the white column below.		
Week 1		
Day 1	20-Apr-15	Monday
Day 2	21-Apr-15	Tuesday
Day 3	22-Apr-15	Wednesday
Day 4	23-Apr-15	Thursday
Day 5	24-Apr-15	Friday
Day 6	25-Apr-15	Saturday
Day 7	26-Apr-15	Sunday
Week 2		
Day 8	27-Apr-15	Monday
Day 9	28-Apr-15	Tuesday
Day 10	29-Apr-15	Wednesday
Day 11	30-Apr-15	Thursday
Day 12	01-May-15	Friday
Day 13	02-May-15	Saturday
Day 14	03-May-15	Sunday
Dates entered are OK		

This report has been designed by BHee / the Energy and Water Team to support school campaigns. It downloads two years' raw data into Excel, and allows you to compare any two weeks from within that period using simple tables and charts.

Choose the date from which you would like to download data (e.g., 2 years ago) and save the spreadsheet locally. Open the 'START choose dates' tab and enter the dates you would like to examine (see left).

For your baseline you can choose 2 weeks at a similar time to your campaign (e.g., 2 weeks in November 2014 for a campaign in November 2015) if you are confident that your school has not changed significantly in this period. If you have gained additional classrooms since last year, it may be better to use more recent data for your baseline (e.g., 2 weeks in early January for a campaign in late January.)

Once you have chosen your baseline dates, the report will analyse the AMR data and produce tables and charts to discuss with pupils and staff. These allow you to compare usage from day to day, looking at the period when the school building is in use (07:30 to 18:00) and when it is more likely to be empty (00:00 to 07:30 & 18:30 to 24:00).



It is a good idea to arrange a meeting with your pupil team and the school's Business Manager to discuss his / her view on the school's energy usage and where savings can be made. The Site Manager may also have some interesting insights, particularly relating to out of hours usage (i.e. evenings, weekends and school holidays.)

Pupil 'detective' work

To find out where energy is being used efficiently in your school, and where there are opportunities for savings, pupils can carry out 'energy detective' work. According to your focus, they should check to see where lights and appliances have been left on unnecessarily; where classrooms are above the recommended temperature of 18°C; and where windows and doors are open while the heating is on.

Are people in your school WASTING ELECTRICITY?

Date spot check carried out: _____

Walk around the school and check each room to see how many lights and appliances have been left on unnecessarily. Record what you find in the table.

Room	Computers or 	Whiteboards or 	Other appliances e.g., 	Lights or
Example	2	1	1	7

Older pupils can design their own formats for recording their findings; the BHee website has downloadable sheets suitable for primary pupils:

<http://bhee.co.uk/resources/eco-committee/>



If possible, conduct your detective work at different times of the day. For example, pupils could check classrooms during assembly, at lunch time, and after school, to get a detailed picture of where savings are possible. They may find examples of good practice in some parts of the school, which can be showcased as a way of motivating teachers and pupils. Conversely, they may spot areas of the school with particular challenges.

If you have a printed plan of the school, your pupils could colour code each room according to what they find during their 'detective work'. For example, pupils focusing on room temperatures could colour rooms that were too cold blue, those that were the correct temperature green, and those that were too hot red. This mapping allows for visual analysis of the current situation, and the map can be displayed to share your findings with the rest of the school.

Remember - it is very important to conduct the baseline monitoring **before** telling the school about the energy reduction campaign and working to change people's behaviour.

b) Agreeing targets

Decide upon target(s), based on your baseline monitoring. The tables in the Schools Campaign 2 week comparison report (see right) make it easy to calculate a kWh reduction (e.g., reducing your kWh electricity usage per week by 10%). You may also want to have a target in terms of recorded behaviour (e.g., reducing the number of whiteboards left on from 80% to 10%). The latter is particularly useful for younger children, for whom the measurement of energy consumption may be rather abstract.

			07:30 to 18:00	00:00 to 07:30 & 18:30 to 24:00	TOTAL
			kWh	kWh	kWh
Day 1	Monday	20/04/2015	139	58	197
Day 2	Tuesday	21/04/2015	150	51	202
Day 3	Wednesday	22/04/2015	146	58	205
Day 4	Thursday	23/04/2015	149	56	204
Day 5	Friday	24/04/2015	151	66	217
Day 6	Saturday	25/04/2015	26	32	59
Day 7	Sunday	26/04/2015	24	32	56
Day 8	Monday	27/04/2015	159	63	222
Day 9	Tuesday	28/04/2015	166	54	220
Day 10	Wednesday	29/04/2015	166	55	221
Day 11	Thursday	30/04/2015	163	56	219
Day 12	Friday	01/05/2015	135	59	194
Day 13	Saturday	02/05/2015	19	26	45
Day 14	Sunday	03/05/2015	19	26	45
TOTAL			1612	693	2305

c) Action planning

When putting together an Action Plan, the team should consider:

- Whether to give the campaign a name to give it a clear identity and ensure pupils have a sense of ownership (e.g., Carlton Hill Primary named their campaign to save electricity 'Turn off the Tech')
- Who needs to be involved? (e.g., pupils, teachers, office staff, mid-day meal supervisors, cleaners, staff who run breakfast / after school clubs etc.)
- What are the key messages that need to be shared? (e.g., the environmental / financial benefits of saving energy; the importance of everybody playing their part; how easy it is to make a difference.)
- What are the best ways to spread the messages to the different audiences? (e.g., posters, assemblies, newsletters, face to face meetings, songs, videos, a 'no energy' day, Twitter campaigns for older students etc.)
- Can some tasks be shared with other pupils and integrated into teaching for different subject areas? (e.g., posters made during Art / IT lessons; articles for the school newsletter written as part of English work.)
- What simple mechanisms will ensure your desired behaviours become embedded in school life? (e.g., coloured stickers on switches to show what can / cannot be switched off; pupil light / blind monitors.)
- How to monitor whether behaviour is changing during the campaign period (e.g., spot checks)
- How to provide feedback about successes and areas that need further work (e.g., a reward system; feedback slips during spot checks)



A primary school's Golden Lightbulb Award

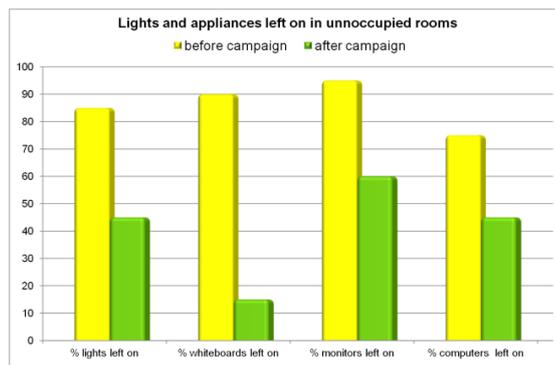
The bulk of the Action Plan should contain easily achieved tasks, responsibility for which can be shared out between pupils. However remember to include plans to be implemented by governors / SLT / caretaker so that pupils know that their efforts are part of a bigger picture.

Post-campaign monitoring and celebrating successes

After your energy saving campaign, evaluate how effective you've been by:

- Repeating your 'detective work'

A simple chart comparing 'before' and 'after' (see right) can help pupils and staff appreciate the impact of the campaign, and is perfect for your Eco-Schools notice board.



- Using the Schools Campaign 2 week comparison report.

Data downloaded and available for analysis:		
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Day 6	25-Apr-15	Saturday
Day 7	26-Apr-15	Sunday
Week 2		
Day 8	18-May-15	Monday
Day 9	19-May-15	Tuesday
Day 10	20-May-15	Wednesday
Day 11	21-May-15	Thursday
Day 12	22-May-15	Friday
Day 13	23-May-15	Saturday
Day 14	24-May-15	Sunday
Dates entered <input type="text"/> OK		

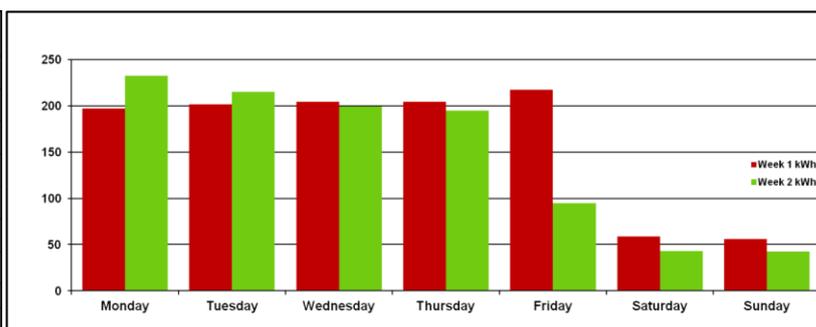
Download your AMR data again, to ensure you have up-to-date readings. On the 'START choose dates' tab enter a week from your baseline period (Week 1) and a week from shortly after your campaign (Week 2). Make sure both weeks start with the same day (see left.)

The spreadsheet will compare these two weeks and display the data in simple charts and tables on the 'campaign tables and charts' tab (see below). It will calculate the percentage change for each day of the week, and for the week as a whole (see below.)

The table on the 'campaign tables and charts' tab will also allow you to compare your usage for the post-campaign week with the kWh target you set before launching your campaign to the whole school.

Be sure to share your successes with the whole school community, displaying the charts and tables as appropriate to the age of your pupils. Of course it may be that you will also have areas to improve in the future, but this is fine as saving energy should be a long-term project rather than a short-term campaign that is forgotten after a few weeks!

All usage	Week 1 kWh	Week 2 kWh	Change kWh	% change
Monday	197	233	35	18%
Tuesday	202	215	14	7%
Wednesday	205	199	-6	-3%
Thursday	204	195	-9	-4%
Friday	217	95	-123	-56%
Saturday	59	43	-16	-27%
Sunday	56	43	-13	-24%
Total	1139	1022	-117	-10%



d) Keeping up the momentum

The aim is for the campaign to kick-start long-term cultural change in your school, so you will probably need to revisit energy issues on a regular basis. Cultural change takes time, so do not be disappointed if it appears that people are slipping back into old habits.

Your pupil team may want to continue with occasional (e.g., half termly) unannounced spot checks, giving whole-school feedback on the results. Some initiatives introduced during your campaign (e.g., class energy monitors, switch labelling) should become embedded into school life, but don't forget that both pupils and staff will need a reminder about why saving energy is

important. As you revisit energy reduction campaigns, ensure you find a balance between rewards and sanctions, and look for new ways of making the issue interesting and relevant to both pupils and staff. You could consider taking part in an event such as 'Energy Month' or the 'Climate Challenge' each year, or incorporating an energy campaign into curriculum work (e.g., connected with data handling or science work on energy).

1. Useful resources

There are many resources online that you can use to support your energy work, whether as part of the curriculum or with a pupil team leading a campaign. Examples include:

The Pod: www.jointhepod.org

EDF Energy's programme for greener schools includes a wide range of downloadable resources and campaign packs including: Goodbye Standby, Switch On To Switching Off, The Heat is On, The Big School Warm Up, The Energy Mix and The Big Energy Show. They also run 'Switch Off Fortnight' each November.



PowerDown: <http://powerdown.actionaid.org.uk/>



A multi multimedia resource from Action Aid, focusing on climate change and how it is affecting young people around the world. The free downloadable pack supports teaching in geography, citizenship and science, and includes a video 'Be Part of the Solution' which is useful for introducing KS2+ pupils to the causes, impacts and solutions to climate change.

Green TV: <http://green.tv/>

A wide range of 'green' videos on a variety of themes including energy and climate change, produced by organisations such as WWF, Friends of the Earth and Oxfam.

The Carbon Dioxide Game:

www.greenteacher.com/articles/Carbon%20Dioxide%20Game.pdf

A fun, active game for helping KS2 and lower KS3 pupils visualize how human activities enhance the natural greenhouse effect.

Operation Climate Control: www.operationclimatecontrol.co.uk/content

An online game for Key Stage 4 students learning about climate change for their GCSEs. The game concentrates on the impacts of climate change, and what can be done about it.