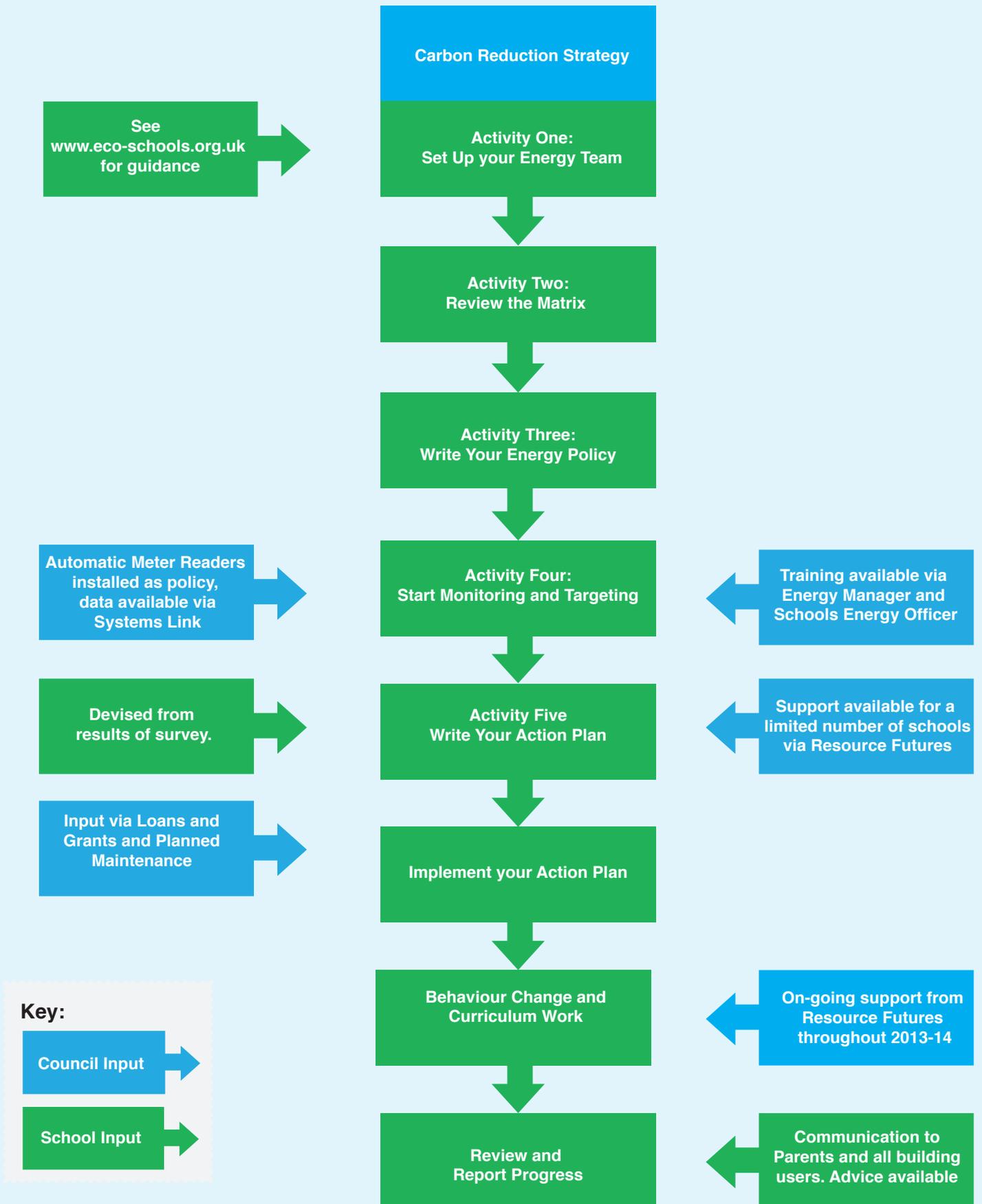


Energy Management Process





Images © Centre for
Alternative Technology

ACTIVITY FOUR – Monitoring and Targeting

**“You can’t manage what
you don’t measure”
– common energy management
mantra**

The most essential step in energy management is to monitor your energy use in order to identify targets for reducing it. Analysing and understanding your hourly, daily, weekly or monthly, annual use will immediately show you where energy is being wasted.

Automatic Meter Readers

96% of schools have an automatic meter reader (AMR) installed on either gas or electricity meters, these are very powerful tools for use in energy management. AMRs provide access to accurate information on how much energy you use down to every 30 minutes. Viewing this data will show how often equipment or lights are left on overnight, if the heating was left on over the holidays or weekends and when lights, equipment or heating is turned on in the morning.

Having a really good understanding of your energy use profile is the best way to find and quantify savings. Some of these will be achieved by changes to behaviour (e.g. turning off computers at lunchtime) and some will be improvements to systems (e.g. installing timers to storage heaters)

The Energy Management team have set up an online system (www.systems-link.co.uk/webreports) to view energy data via a series of reports or in its raw form for downloading into Excel.

This data can be used in lessons to teach ICT and maths skills, or by the Eco-Team or senior management for budget tracking, targeting improvements, evaluate energy savings campaigns and look for malfunctions in heating systems.

A log in to this system is available from the Energy Management Team.

Contact Jeff Tatum on:

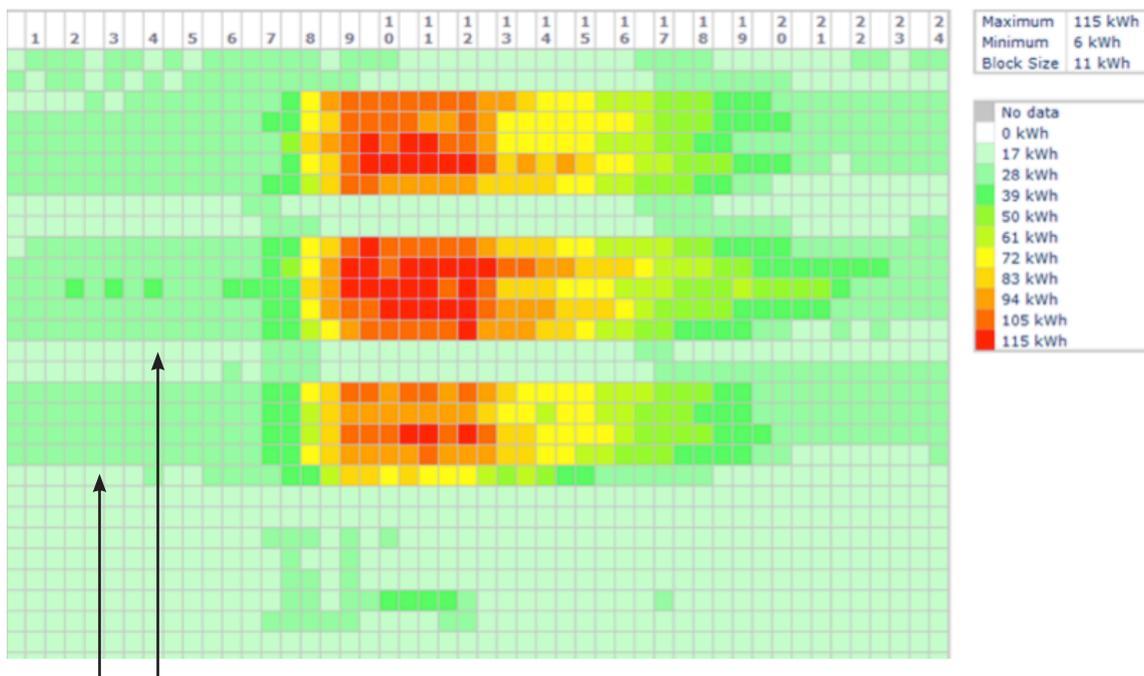
Jeff_tatum@bathnes.gov.uk

How to Use Energy Data for Energy Management

Electricity Data

Below is an example of a profile footprint report taken from SystemsLink. You can view these for your school.

Each row of boxes show one day of data broken into boxes of 30 minutes. Red boxes show the highest use.



Here you can see more overnight use in the week compared to weekends, this suggests equipment is being left on overnight but that on a Friday users are more diligent in turning it off.

What does this mean?

In the previous graph 11kWh extra electricity is used every 30 minutes overnight during the week. This adds up in the following way:

6pm to 7am totals 13 hours, or 26 30 minute boxes.

Each of those 30 minute boxes has 11kWh excess electricity.

So $11 \times 26 = 286\text{kWh}$ a night is lost. At an average of 10p a kWh the money lost per night is: £28.60p a night.

Which is not much for one night, but adds up throughout the year!

Daily Profile Graphs

You can also look quickly at day-by-day graphs within Systems Link which gives you a more accurate and detailed picture. In the image below you can see that overnight the school uses about 17kWh in a 30 minute period, this rises rapidly from 8am and drops slowly in the evening. In this example the school has a sports centre and the high use around 8pm is linked to flood lights on the sports pitches.



Making Savings by Reducing your Baseload

By looking at the usual energy use overnight and at weekends you can work out the energy used by the building 24/7 – known as your baseload.

Making reductions to this is a good way to make savings.

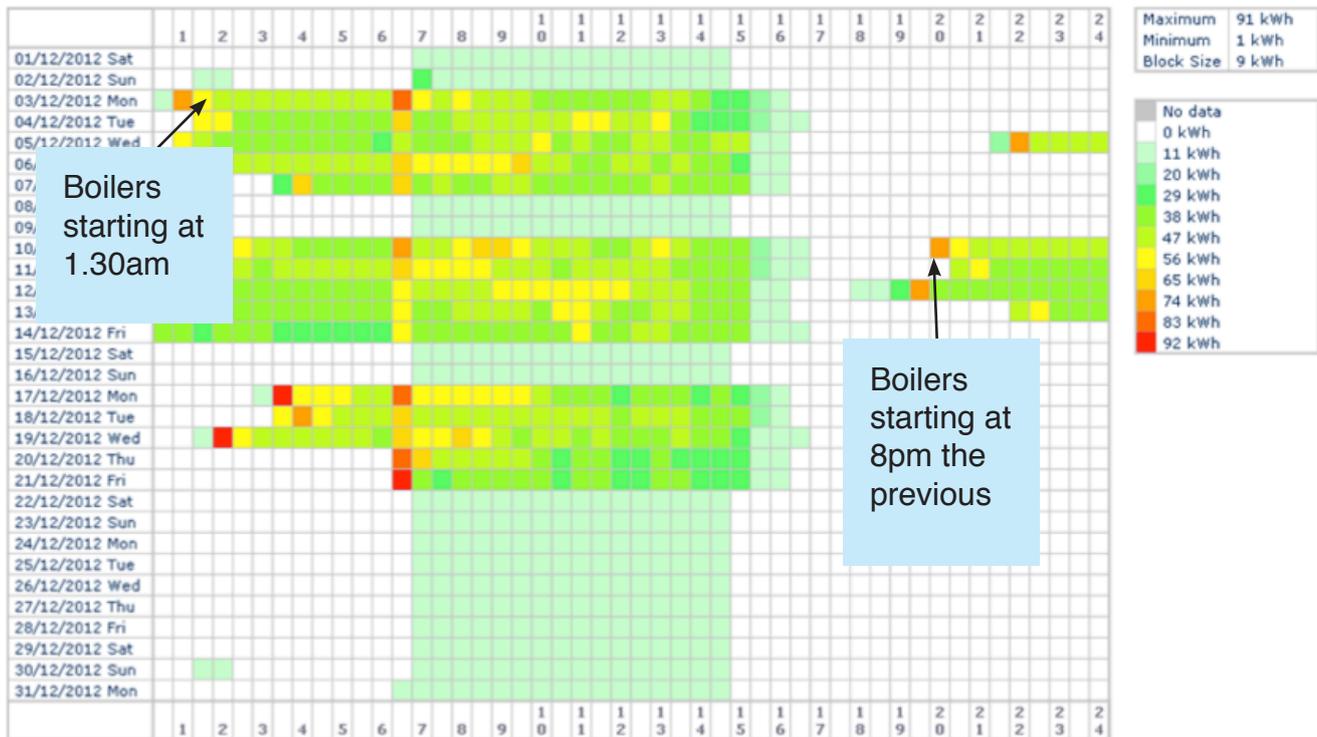
Calculating savings on your baseload is straightforward:

1 kWh per 30 minutes – is the same as
2 kWh per hour – which is the same as
48 kWh per day, or 17,520kWh a year

Gas Data

Looking at gas use data can highlight when there is a problem with the boilers or boiler controls and settings. In most cases boilers should not be running more than a few hours before the building is occupied. This graph shows gas use through the day over a month.

If your boilers are running from midnight continually until the end of the school day this indicates a potential problem with your boiler settings or controls. If you have a caretaker they may feel comfortable checking this, but if not then you can engage a heating engineer. Make sure you show them the energy data when they visit your school.



Your Eco Teams Role in Monitoring and Targeting

Your eco team can have a large role in monitoring and targeting by regularly checking for waste and communicating energy data to other school users.

Your pupils and staff are your best asset when it comes to energy efficiency and energy management. Once they are 'on board' with your policy, with the help of your eco team, you will make savings overnight by cutting waste. e.g. by moving book cases away from the front of radiators. Using the available data to give them information on energy use will help bring them on board and ensure they concentrate on the most effective actions.

Here are some activities for your eco team:

- ➔ Conduct a survey to find out how many lights / IWBs / monitors / appliances are left on unnecessarily during the school day. This could be done by your Eco Committee, or delegated to a class as pupils as part of maths work. Identify any areas of good practice, and those where there is scope for savings.
- ➔ Conduct a survey to find out more about room temperatures around the school. Use a map of the school to colour code rooms which are too cold, too warm, and at a suitable temperature for learning. This activity could be carried out by the Eco Committee or a class of pupils as part of maths / science work.
- ➔ Design a questionnaire to gather pupils' and teachers' opinions on room temperatures.
- ➔ Design a questionnaire, or carry out interviews, to find out about adults' knowledge of room temperature controls and how to use them.
- ➔ Set up a suggestion box to allow all users of the building to feed in ideas about how the school could save energy (you may want to include other Eco-Schools topics as well.)
- ➔ Set up regular meetings to discuss AMR data.

Using an OWL to monitor electricity use

Nearly all schools will have at least one Automatic Meter Reader, but in cases where it is attached to your gas meter and not your electricity meter you may be able to use an OWL Monitor to analyse your electricity use.



OWL Monitors are designed for a domestic home but can work in schools. OWL monitors clip over your electricity supply cable and display your electricity use via a wireless monitor. This can be used by eco teams to regularly record electricity use, check baseloads and check for equipment left on.

The OWL monitor displays your current electricity use, and also tracks cumulative electricity use over the last day, week, month and quarter.

Eco Teams can use this to record electricity use and plot it into excel to create similar graphs to those available using AMR data.

OWL monitors are available to borrow from the Schools Energy Officer
sustainability@bathnes.gov.uk

Extra Curricula Activities:

Why not set home energy monitoring as homework? Run a competition to see who can reduce their electricity use the most over two weeks.