

BUILDING SUSTAINABLE FUTURES

ENERGY REDUCTION TOOLKIT FOR FINANCE TEAMS IN EDUCATION

AMBITION

INTEGRITY

INCLUSION

EXCELLENCE

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PART OF BESG



WHO ARE BMSI?

BMSI are the UK's largest and leading independent Building Management Systems Integrator. Formed in 1998, we have over 30 years of supporting Primary, Secondary, Further and Higher Education establishments across the U.K. in managing their facilities to provide an environment that is conducive to learning, but in as energy efficient manner as possible.

HOW DO WE DO THIS?

We have a track record of reducing the energy consumption of our customers within education through:

- Provision of energy monitoring equipment, software, analysis and reporting to identify areas of energy consumption for further investigation or remedial action.
- Provision of Building management systems to meet the needs of these energy profiles, but also ensure energy efficiency in what are incredibly dynamic buildings / operations.
- Provision of maintenance, management, energy efficiency software for the BMS to ensure that it is running to the exact needs of the school.

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WHY MAKE A TOOLKIT?

Firstly, why are we writing a toolkit for schools? Principally, because schools are underfunded, and facing increasing energy bills, as a business that specialises in the reduction of energy consumption, we feel a duty to share some simple initiatives that might help ease this burden.

Secondly, our team have surveyed dozens of schools each year and the common theme among all of them is that there are multiple opportunities for no cost or low cost initiatives that can help reduce energy consumption and the corresponding bills.

Thirdly, once you have exhausted these approaches then we will be in a great position to potentially help you achieve further reductions and add real value to your organisation through our specialisms within Energy Management and Building Management Systems.



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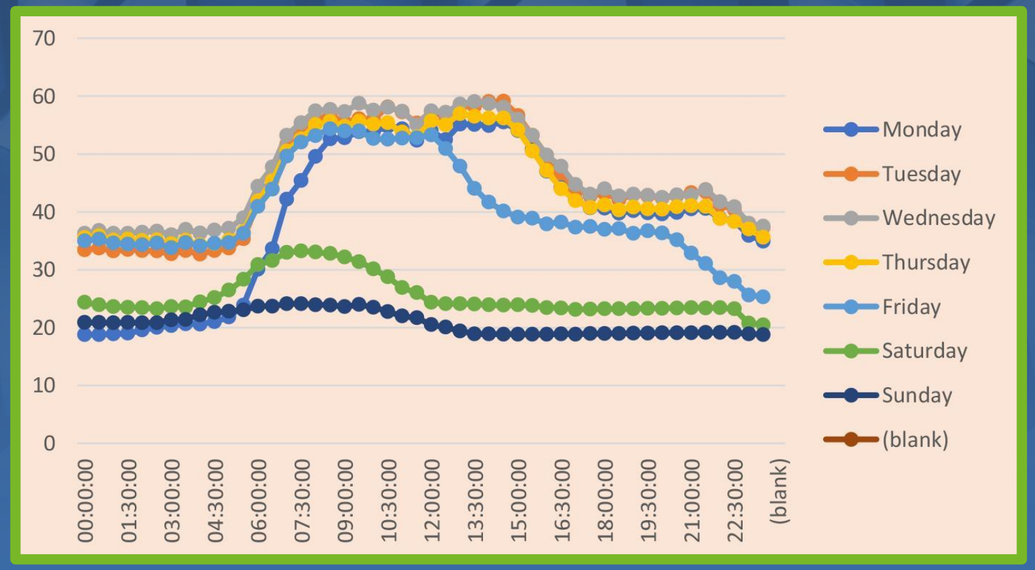
YOUR ELECTRICITY DATA

Your own half hourly electricity and utility data won't answer your energy questions, but it will get you to ask the right questions.

- Contact your energy supplier and ask them for 2 years of half hourly data – they are legally obliged to provide this for you.
- Use this information to produce an average consumption of Monday – Sunday that you can filter by date. (see image)
- Map this against your operational hours.
- When is energy consumption beginning to rise? This rise, up to your start times is a potential reduction in consumption.
- How long post the hours of the school does it take to reach a baseline of consumption?
- Is the baseline roughly 10-20% of your peak consumption? Its never zero due to things that protect the fabric of the building – alarms, refrigeration, emergency lighting etc.
- Why not make this a topic for an IT / maths class to uncover the inefficiencies they see?
- Workout the kWh you can potentially look to save and its cost as a target.



TASKS

Check the baseline v peak school hours.

Check the start up & shut down of the building v core hours.

What is your consumption during holidays? Is this higher or lower than your operational week? Why?

Small consumption on a daily basis, soon grows when multiplied over a year.

Change your pivot to maximum not average at 12am –5am to uncover potential control issues. When did they happen? Why?

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ENGAGEMENT

Key stakeholders will provide momentum, influence and deliver key actions.

To really resolve your energy efficiency within a school environment, there are key stakeholders that are going to be key allies to enable the school to become more energy efficient.

Its important to remember that it is potentially the first time anyone may have exposed some of the inefficiencies you find, create an environment of a safe space for all to discover, and resolve these issues together.

Finance – if there anyone that will want to see bills reduce it’s the bursar.

Facilities – any major changes to plant operations, operational times of the building, will need the support of any already busy facilities team.

Head of department – what can they do to help trim energy consumption down within their teams.

Pupils – creating a sustainability team within the student body will enable application of a variety of subjects to carbon reduction.



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YOUR PLANT

Plant left in hand is the biggest drain on your energy consumption.

Most schools are equipped with a BMS, a system that automates the operation of energy consuming plant equipment. Equipment such as boilers, boiler pumps, heating, lighting, air conditioning, and Air Handling units can be put in Auto (BMS controlled), off or Hand (this means it is always on).

We often see plant that has been taken out of control of the BMS, always for the perceived benefit of the school, but also due to a lack of knowledge of how to interrogate a BMS to change schedules and set points. It's easier, quicker and operationally safer for a facilities team to turn equipment to hand and ensure the environment is good for thar parents evening, or event at the school than reconfigure the BMS. This is often left in situ.

Conduct and audit of the plant rooms, see what's in hand and investigate why it is not in control of the BMS. Your BMS maintenance company should be supporting you in ensuring plant is well controlled.

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HOLIDAY PREPARATION

Prepare your building for Holiday periods.

Your half hourly data during holiday periods should show minimal energy consumption. Some teachers/ staff may be present during the holidays and some areas may be hired out.

What does your utility data show you? Is it 50% of your term time consumption? Is it congruent to that 50% of the building is open, or 50% of the activity is taking place?

What is your school shut down process for holidays to ensure that only the vital systems are left running to protect the fabric of the business and support areas that have been hired?

When you look at the energy costs of keeping the school open, does that correlate with your charges to holidays clubs and hired facilities?

Consider opening the school for staff on set days if essential, if it is not essential that there may be a cost benefit to staff working from home, instead of incurring energy costs of keeping the school open



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SEASONAL PREPARATION

Reconfiguring the building for seasonal variation can avoid costly plant running inefficiently.

Winter and summer have very different demands placed upon your building, and your plant should be configured to reflect that.

Look at your utility data, is there a significant difference between summer and winter gas / electricity consumption?

We would expect to see lower electricity and gas use in summer due to longer, lighter days, and a warmer climate.

If there isn't a significant difference, what can you do as a school to ensure that you're taking advantage of warmer temperatures and more natural light?

Can your heating come on later in the mornings and switch off earlier in the afternoon? Can you reduce its set point?

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OPERATIONAL HOURS

Are your operational hours, really your operational hours?

Viewing your half hourly electricity data, work out the amount of energy consumption between core school hours finishing and when staff are leaving the building.

This is a potential reduction in consumption in consumption and cost by shortening these hours, particularly if there is only a handful of staff in the building and particularly When you multiply these savings across 52 weeks of the year.

Most schools have core teaching hours until 3pm, with extra curricular activities taking place until between 4 and 5.

If you are providing a full environment of heating, lighting and air handling to only a handful of staff, this could be the exception not the norm.



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SUSTAINABILITY FOCUS GROUP

Your best, most numerous and most passionate energy advocates are your pupils.

Creating a sustainability focus group where you can implement these strategies is important to gain buy in from the student body and help gain control over an extremely dynamic environment prone to small-and large-scale changes in occupancy throughout the day. Our apprentices also tell us that they chose to pursue a career in BMS due to their enjoyment of STEM subjects but wanting to implement that in a sustainable / green sector.

Your sustainability task force should include:

Energy Management and Analysis of half hourly data –
should be a monthly key project to have your task force look into.

Look at what aspects of this checklist your pupils can implement or manage as a project.

Energy champions to be your advocates throughout the student body.

Energy monitors – be your eyes and ears to equipment / lighting etc.
being left switched when it is not needed.

Report to the school on what they're doing, their findings and their Progress.



- Automated data collection from onsite sub-metering and revenue grade meters.
- Bespoke Dashboards.
- Automated reports.

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FURTHER SUPPORT

For help with any of these initiatives or help with reducing energy consumption on site. BMSI are here to help

We're experts at energy management and our team of energy managers will help you to analyse your energy consumption free of charge. If you provide us with the data, we'll perform the initial analysis for you to get you started.

Similarly, we'd be excited to support you in gaining some momentum in these initiatives where possible.

Naturally, we're specialists in building management and control of building systems so if you identify areas where you need our support we'd love to attend your site and explain how we can help to bring your buildings and energy consumption under control.

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