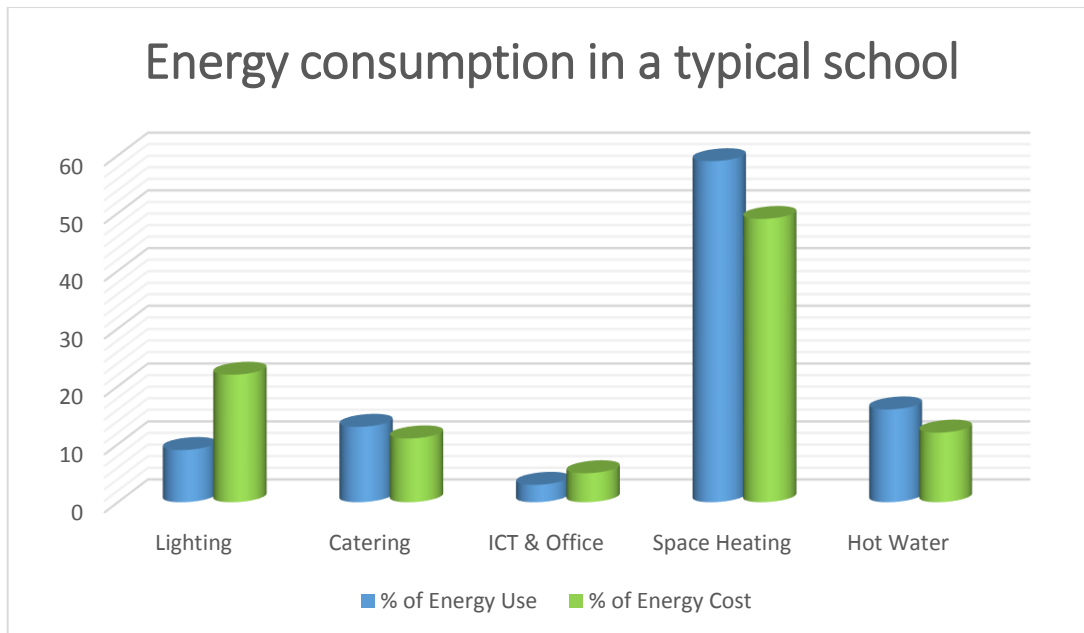


# TARGET AREAS



We start with the big beast of school energy consumption - heating (taking up an average 58% of energy usage and 45% of energy cost). Any savings you can make here will have a **big impact**.

## HEATING & HOT WATER

Controlling usage is the key. Often excessive peaks in usage occur because someone made a short-term adjustment and forgot about it. Energy management is all about three things:

- Finding out your usage issues
- Making changes
- Ensuring they can be maintained

In the majority of schools quick and substantial savings come from a more precise understanding of where heating is poorly performing or controls are not functioning as they should. Your school's own energy data can be used to ensure that it is heated only when and as much as is needed. Usage will vary in any week dependent on what space requires heating but you can simply and strategically manage this.

The average school saves over 10% on heating bills as an immediate result of analysing usage data. This immediate saving can be greatly increased through simple changes to how equipment is used.

### Loving your boiler

It is possible to cut heating costs by up to 30% by implementing some simple boiler-related energy saving measures. All modern boilers are capable of achieving an efficiency of at least 80% by taking simple actions to impact their performance.

- Carry out regular boiler maintenance - not just repair

*Over time mechanical components become worn which can affect combustion efficiency. Therefore burners and their controls need to be checked at regular intervals and adjusted or replaced as necessary. Boilers have to be certificated once a year (twice a year for oil-fired boilers). Having them serviced at the same time can make the boiler 10% more efficient.*

- Minimize heat losses

# TARGET AREAS

*Keep boiler insulation in good condition. All pipework, valves, flanges and fittings in the boiler-house should be adequately insulated and valve mats/covers should be replaced after maintenance work.*

- Have a register / checklist for regular boiler checks

*Detail records of work done, the person responsible, and when they were completed. This will ensure that tasks are carried out at the correct frequency and will highlight ongoing problems. Especially useful if you are lobbying for central funds for a more efficient boiler!*

- Consider boiler replacement

*In the longer term, if a boiler is more than 15 years old, or if it is showing signs of inefficient operation, it may need replacing. Capacity/size requirements, boiler compatibility, and financial and environmental impact must all be considered in the process. Your school site, buildings and usage may have changed considerably since the previous boiler was installed. Payback can usually be expected within a few months of installation.*

## Heating and Hot Water Controls

Who in school understands how the heating is controlled?

*It is good to have more than one person in school understanding the heating system but the biggest barrier to controlling heating is that it being adjusted by too many people all at once, all with differing views on what is the right temperature for each area. At a senior level, agree a standard temperature for each area. On a daily basis this can then be maintained by one person.*

Is the building connected to a remote energy management system (BEMS)?

*Most LB Newham schools are connected to the Allan Martin system via OneSource. Find out how it works and who controls it. The more knowledge you have, the more savings you can make.*

Take regular thermometer and hot water temperature readings across the school to double check the readings of the heating controls.

*This can easily be linked to curriculum topics.*

Consider replacing old or unreliable controls.

*Modern controls can adapt to the actual time required to heat your school and can compensate for weather conditions.*

Double-check timers after clock change from BST to GMT.

*If the heating is on at the wrong times, you could be paying for an extra hour of heating or an extra hour of compensation heating made up from portable heaters.*

## Reducing heat loss through hot water (and your water bill!)

- Fit percussion taps which turn off automatically
- Deal with drips and leaks promptly
- Insulate hot water storage tanks and their distribution pipework
- Make sure the most efficient heat source is used for heating water
- Rationalise the system to reduce long distribution pipes
- Provide cleaning staff with point-of-use water heaters during holidays

Spotting overheating and operation faults using your usage data



# TARGET AREAS

All Newham schools who purchase through LASAR (KCC) now have access to their half hourly gas usage data (see section 3c for details on how to access).

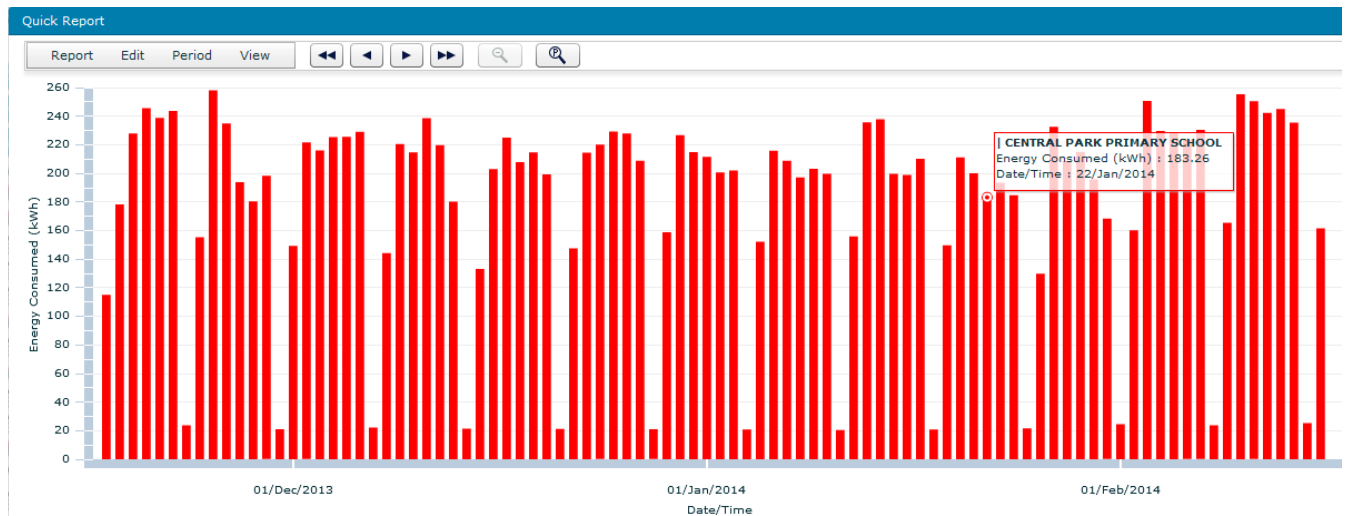
It has been estimated that schools are spending an unnecessary 10% on their gas bills just through faults in timer equipment, heating triggering too early or for too long and from unchallenged billing mistakes.

Have a regular programme for monitoring your data.

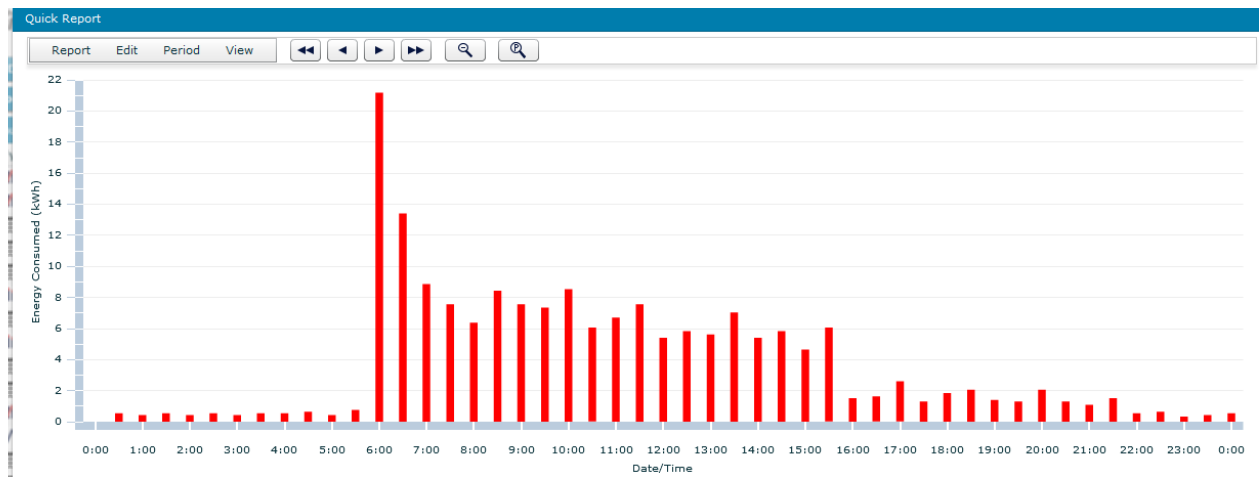
*When reviewing readings use a monthly report (giving you actual usage on each day over a month) and a 24 hour report (giving you overnight activities and timings that heating is turned on and off).*

- Details for accessing your online usage data and storing readings are in the appendices

Example 3 monthly report:



Example 24 hour report:



When looking at YOUR data ask the following;

- Is the heating on outside of school / hiring hours?  
*Pay particular attention to half terms, evenings and weekends. Do you use the actual gas usage to calculate hiring costs?*
- Is the heating staying on too long?



# TARGET AREAS

Use classroom thermometers (cheap cardboard ones are available [here](#)) to see how long it actually takes to heat the school to a required temperatures. This is a good activity for pupils as part of Energy Group or within lessons.

- Is it coming on too early on a morning?

*As above, measure how long it actually takes to reach required temperatures rather than relying on how it feels. You may be surprised!*

- Are there times the whole school is heated when only one or two rooms being used?

*There can be a similar issue for lighting. If staff are staying late - can there be a policy to keep only certain areas "open"? This is common practice in business premises and it could release more funds available for teaching resources!*

- Are there unexpected spikes of gas usage during the night?

*This is a very common occurrence with a very high cost. Heating comes on and off through the night for no reason and everyone remains unaware it is happening.*

*The most common cause is mis-programmed timer equipment. This can happen very easily as equipment becomes more and more digital. There may also be faulty timer or firing equipment. Check any timing controls you have first, and then contact OneSource or your facilities managers to rule out equipment failure or failure of the BEMS.*

- Does the gas usage drop to zero when heating is off - if not, what is still using gas?

*On your data sheet it is easy to spot the peaks and troughs when heating comes on and off and assume all is ok - but don't forget to look for the smaller detail. As with a dripping tap, your gas spend can be trickling away every day.*

## Air Conditioning

Air conditioning can use a huge amount of energy. In fact, air conditioning can increase a building's energy consumption and associated carbon emissions by up to 100% - but with increasing use of IT equipment some a/c is present in most buildings. Luckily, there are some simple, low-cost ways to save energy and make your air conditioning system more efficient.

How is your air conditioning controlled?

*As with heating systems, air conditioning is at risk of being controlled by too many people at once causing different areas to be too hot and too cold - often at the same time. The process of cooling air requires a very high energy levels; use and stick to agreed school temperatures.*

*Train staff on how to operate air conditioning units and heating controls. A simple laminated sheet explaining in-room controls and agreed school temperatures can reduce costs (and frustrations!) considerably. Ensure remote controls are stored in accessible and obvious places.*

Know your air conditioning equipment

*What needs cleaning or maintenance and when? Louvres (movable slats to guide the cool or heated air) are a feature on most air conditioning units and, if appropriate, staff should be able to operate these to maintain a comfortable temperature.*

Has the air conditioning been tested recently and how often is actually needed?

*Make sure your air conditioning doesn't operate below 24°C. Also, make sure that you don't have the heating and cooling systems competing with each other - it's a waste of money. The best way to do this is to keep a temperature gap (known as a 'deadband') between your heating and air conditioning control temperatures. 21 to 24 degrees is standard.*

And remember, leaving ICT equipment on will cost you double - for running the equipment itself and for dealing with the additional heat it is producing.



# TARGET AREAS

## Working Together - changing attitudes & behaviour to heating

Upfront savings can be made from addressing equipment and control issues, but long-term savings can only come from changes to how much the heating is used.

A whole-school approach to monitoring and reducing heating usage has been proven to reduce annual fuel costs by 10-20% - not to mention the learning opportunities in areas including climate change, global dimension, and financial responsibilities.

- See the **Roles** section for more information

Encourage feedback from staff and pupils

*Ask where hot or cold trouble spots are and try to address them. Involved staff and pupils are far more likely to remain positive and make the effort on a daily basis. As with your home heating, good habits can save money.*

Use thermometers rather than people to decide whether an area is warm enough

*It is far cheaper, and better for the planet, for people who feel the cold to wear extra layers than to overheat everyone.*

Thermostats should be set centrally where possible and be tamper-proof

*Staff (or pupils!) turning them up does not speed up heating but does lead to wasted energy and overheating, particularly in schools with complex systems which need to remain in balance.*

Agree school temperatures. Recommended temperatures in schools are:

- classrooms 18°C;
- corridors / general areas and areas of physical exercise (e.g. gyms) 15°C;
- areas of low physical exercise (i.e. sick room), with special needs or very young children 21°C.

**For every 1°C of extra heat, your heating bill increases by around 8%.**

The Energy Group students can design eye-catching laminated posters to put inside the door of each classroom / space that remind everyone:

- How much money or carbon the school is trying to save
- The agreed temperature for that classroom / space
- A checklist specific to leaving that room, for example:
  - ☆ All lights off?
  - ☆ (Specific equipment) off?
  - ☆ Windows closed?
  - ☆ Radiator clear?

## LIGHTING

Can't change the lighting you have without a costly rewire and installing new lighting?

Perhaps you can...

### Low-cost changes

Install PIR (passive infrared motion sensors) wherever possible

*By dimming or switching off lighting when there is nobody in a room, occupancy sensors can reduce electricity use by 30%.*

Rewire lighting controls for small groups of lights, or even individual lights



# TARGET AREAS

*The more control you can have over the light you use, the less likely you are to waste energy. So consider fitting dimmer switches, automatic presence or sunlight detector sensors.*

## Change bulbs and tubes

*What types of fluorescent tubes do you currently use? T12 (36mm), T8 (25mm) or T5 (19mm)? The best are T5, which generally come with high frequency ballast in new fittings.*

*Installing new high frequency fluorescent lighting eliminates flicker and hum, extends lamp life and can often reduce consumption by around 25%.*

*Replace standard light bulbs with more efficient compact fluorescent bulbs. They have a longer life, lower maintenance costs and use up to 75% less energy.*

*Dimmable LED luminaires can now save massive amounts of energy. Light fittings can often be replaced with new LED versions with no rewiring needed.*

- A table explaining lighting options is included in the appendices

## Use task lighting rather than light the whole area

*Task lighting is a good way to minimise the amount of electric light being used, by lighting just the working area to a higher level and providing background lighting at a lower level for the rest of the space. The use of task lighting can also reduce glare on computer screens making it more comfortable for users.*

## Consider turning off external lighting

*Exterior lighting should be limited to the hours of darkness. It may not be necessary to have lights on continuously throughout the night. Consider fitting lighting controls to limit hours of use and have daylight sensors.*

## Simple Maintenance

**Without these simple housekeeping measures, light levels can reduce by 30% in 2-3 years**

- Clean lamps and fittings
- Check and replace old and dim lamps
- Ensure controls are in good working order
- Clean occupancy sensors
- Regularly clean windows and skylights

## Good Habits - Working Together

Switching off even one light saves money, and across a school campus savings can be quick and dramatic. This is an ideal activity to be pupil-led. It gives pupils a chance to “mark” the performance of staff and to measure savings before and after campaigns.

An Eco-Committee and/or classroom monitor system can ensure that lighting usage is confined to what is absolutely necessary.

It is possible to cut lighting costs by up to 30% by implementing energy saving measures. Lighting a typical room overnight wastes enough energy to heat water for 100 cups of tea.

## Turn off fluorescent lights when not needed

*Don't believe the myths! Fluorescent tubes use only a few seconds worth of power to start up. It is always better to switch them off when leaving a room or when not needed.*

Have you put things in front of windows? Do you regularly leave blinds closed or half across?



# TARGET AREAS

*It's not just about cutting down on lighting. We all need to see sunlight and outdoors to feel positive and healthy. It's a medical fact!*

## Last Out? Light Off!

*Pupil eco-monitors can help with double-checking a room as it is left, undertaking regular walks to turn off missed lights and spotting regular offenders!!*

*A lot of energy is wasted when unnecessary lights are left on during breaks and out of hours. How often is the school lit up on an evening when only a small area is being used? As with heating consider an after-hours policy for only working in set spaces.*

Does the switching pattern suit the room?

*Most classrooms do not need all fitted lights on during normal daylight; some need no lights on. Identify the minimum appropriate level of lighting and mark light switches accordingly.*

A good way to develop a best lighting plan for each room, which everyone understands:

*Test each room on an "average" day. Switch off all the lights and turn on row by row, starting from the wall furthest from natural light.*

*Agree as a class at what point lighting is "right". This could mean individual pupils recognising they need more than average light and therefore taking a seat by a window.*

*Put green, amber and red dots on switches to indicate which lights are always, sometimes and never needed.*

*With these labels on light switches across the school, everyone knows what to use first.*

## CLASS AND OFFICE EQUIPMENT

A single computer and monitor left on 24 hours a day could cost around £45 a year. How many do you have in your school?

Equipment type	Average power consumption while in use (watts)	Standby energy consumption (watts)
PC (processor only)	74	6 (deep sleep) / 36 sleep
PC monitor	100	4 / 7
Inkjet printer	17	9
Laser printer	280	18
Fax machine	82	7
Photocopier	400	103

Carbon Trust

## Fitted controls

Automated power-down tools are vital for the high numbers of PCs and equipment in school

*There are both software options to fully power-down computers when left idle, and socket additions to fully shut down any equipment left on standby for too long. Instant payback!*

# TARGET AREAS

Think about timer controls

*A single photocopier costs £53 per year more left on standby overnight than turned off fully. A timer socket would cut this immediately, and seven-day timers would save even more.*

Ensure heat-generating machinery (e.g. photocopiers) are situated in a cool area away from radiators

*They all come fitted with cooling mechanisms, but that is burning through your fuel bill. Far quieter and cheaper to give the cooling fans a day off!*

Turn off non-essential appliances overnight and when not in use

*The bare minimum of electrical equipment actually needs to be left on overnight - computer mainframe, answering machine, alarm system, freezers and some fridges. A list of these can be kept and reviewed regularly. Using labels on plugs to show this can help.*

## Good Habits - Working Together

The TURN OFF message is a powerful component of any whole school campaign to reduce energy use. The more everyone understand the actual cost of leaving equipment on the more likely they are to turn it off. The Carbon Trust has excellent posters and information to help this.

We can all forget to turn off equipment, but if everyone forgets then 1p becomes 50p, and then over a week £2.50, and by the time a year has passed hundreds of pounds are being “forgotten”.

There are all sorts of innovative and simple ways of “encouraging” us when we forget!

- Eco-Group members love the role of policing teachers, awarding smiley faces or filling out report cards
- Labels or posters next to equipment can tell everyone the actual cost of leaving it on (and maybe include what this money COULD have been spent on!).
- Eco-Groups can promote key messages in assemblies, newsletters, and the school intranet.
- Save up photocopying until you have a batch

*The office photocopier is likely to be your biggest energy consumer. Maximise standby savings by encouraging staff to copy in batches where possible, to allow the machine to spend more time in standby than idling.*

- Kill the blue lights

*Encourage a fixed routine for classes and staff to scan for monitor lights shining at the end of a lesson or a school day. Every light left shining is sucking your budget for doing more interesting things!*

- Check the room

*An eye-catching checklist on every door can highlight room-specific equipment*

## Longer term

Ensure that all new electrical equipment is “A” rated for energy consumption

*An energy star compliant printer uses at least 60% less electricity and most will automatically enter a lower power setting after a period of inactivity.*

Consider voltage optimisation

*The voltage of supply that comes into your building can be anywhere between 216.2V and 253V depending on local conditions. New equipment is designed to function best at 230V, while older equipment has greater variations. A voltage optimiser will sit at the point of supply to the building and will control this ebb and flow of voltage.*

*But why is this important?*



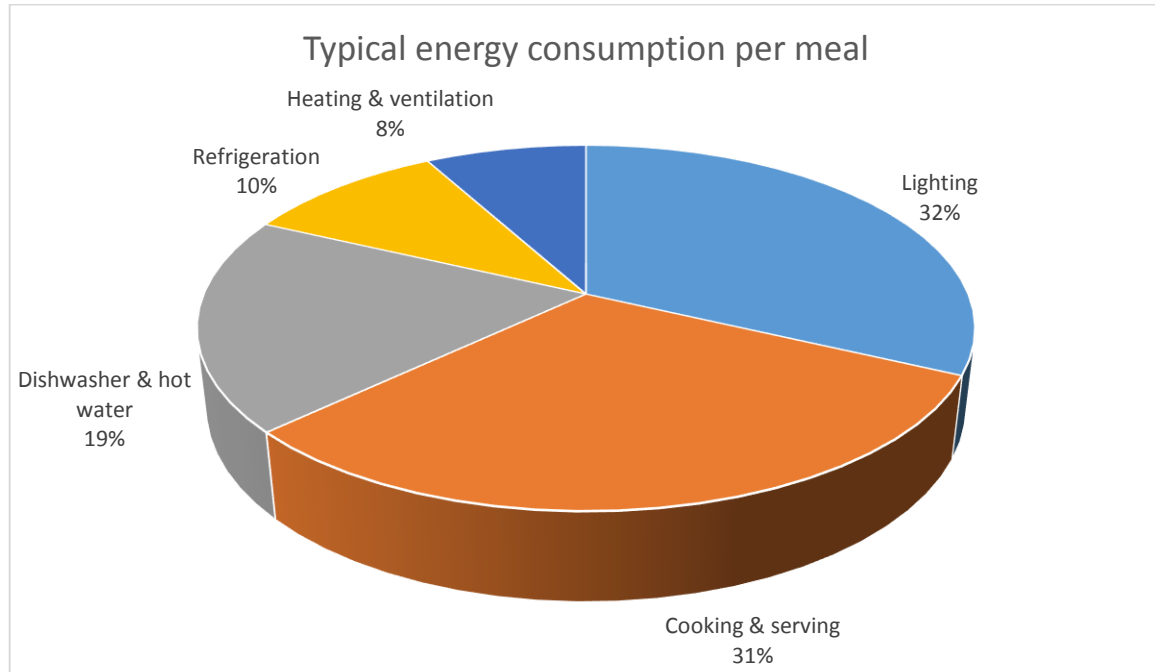


# TARGET AREAS

Overvoltage at a basic level is purchasing energy that is not used - like an overflowing cup.

Also, over- or under-powering equipment significantly affects both its performance and lifespan.

## CATERING



Carbon Trust

Could you consider sub-metering for the kitchen areas?

Cost savings can be identified and investments justified. This could be of particular use when catering is provided by a separate company who are not part of the wider school energy-saving commitment.

### Catering - Cooking/Serving

Large quantities of energy are consumed in the kitchen, of which often only a small proportion is actually utilised in cooking the food. In many cases, most of the cooking equipment energy is wasted into the surroundings. Significant savings can be made by following the relatively minor changes in organisation and control as detailed in the steps below.

Label warm up times on cooking equipment

*To avoid cooking equipment being on longer than necessary you should label all cooking equipment (ovens, fryers, grills etc.) with the required warm-up time. This information should be available in the equipment operating manual or if not it may require some practical tests. Preheating should not normally require more than 15 minutes for large ovens and less than 10 minutes for many convection ovens, fryers and grills.*

Use equipment to maximise capacity

*Try to plan cooking schedules so that ovens, fryers, grills etc are full or near full when operational as this will reduce the time the equipment needs to be on to cook the same volume of food.*

Avoid opening oven doors

# TARGET AREAS

*Use the viewing panel to inspect food whenever possible so that door opening and therefore heat loss is minimised. This will reduce the power consumption of the oven and minimise cooking times.*

Use appropriate size utensils

*Pots and pans should be chosen with the appropriate base size for the heating ring. Baking tray sizes should be chosen to maximise cooking space within the oven.*

Keep lids on pans

*Make sure that only the required amount of water is put in saucepans and kettles, and use lids and covers to retain heat.*

Ensure simmer controls are used where possible

*Turn down hob rings to simmer food and do not move pans off centre of ring. Rapid boiling does not cook food any quicker, but will use additional energy and heat up the kitchen.*

Avoid prolonged warming

*Hot storage of cooked food should be kept to a minimum. Avoid cooking food too early, both to reduce unnecessary equipment usage and ensure a good quality product.*

Only use serving equipment as required

*Hot plates, warming cupboards and heating lamps are very energy intensive (heating lamp 500w). Only switch on when needed and turn off as soon as possible.*

## Refrigeration

Compared with the high power ratings of cooking equipment, the installed capacity of refrigerators and freezers is relatively small. However, because cold storage equipment is in continuous use it creates significant energy costs.

Fully use refrigerated space

*Stack food so that it maximises the use of the chilled space available without preventing airflow around the cabinet. When stock is low, transfer the contents to other units and switch empty cabinets off.*

Minimise door openings

*Open fridge and freezer doors as little as possible. Try to place all food for one sitting into one or more service refrigerators so that temperatures in main storage units can be maintained, thus reducing energy consumption.*

Ensure correct temperatures are maintained

*Set refrigeration temperatures according to the produce stored and periodically check that these temperatures are maintained. Refrigeration temperatures set too low increase running costs by 2-4% per degree. Overcooling also increases the probability of equipment failure.*

Defrost frozen food in refrigerators

*Plan so that frozen food is defrosted in refrigerators as this will reduce load on fridges (remember this will take longer than at room temperature). With careful planning you may also avoid having to defrost food in microwaves.*

Do not place hot/warm food in fridges/freezers

*Wait for food to cool down before placing it in refrigeration cabinets otherwise it will increase energy consumption. Don't make the fridge's life harder!*

Defrost regularly



# TARGET AREAS

*Keep fridges and freezers ice-free and follow appropriate defrosting regimes according to the manufacturers' recommendations (every two months as a minimum).*

## Manage display fridges/vending machines

*Where display fridges are used in the serving area ensure that either night blinds are used or units are emptied of perishables and switched off during non-serving hours. Also consider the use of seven day plug-in timers for display fridges, water coolers and vending machines containing non-perishable items. Third-party machinery (e.g. vending machines, water coolers) can be put on a seven-day timer by agreement with the supplier*

*Remembering that in some cases, the energy used to run these items continuously is more than the revenue the school may be getting from the supplier*

## Regular cleaning for optimum performance

*Carry out regular cleaning and maintenance checks, in particular check that seals on cabinet doors are clean and undamaged, the inside of the cabinets are clean and ice-free and condenser coils are clean and unobstructed.*

## Properly locate fridges and freezers

*Refrigerated storage should be positioned (as far as possible in unheated areas which are well ventilated and away from heat sources such as ovens and grills etc. Each refrigerated cabinet should have sufficient air-gap around it to allow air to circulate (especially around the back where the cooling elements are, up to 6 inches) and staff should be instructed not to block it, for example by placing trays over ventilation panels.*

## Dishwashing and hot water use

Washing equipment used in catering facilities can consume substantial amounts of energy.

### Maximise dishwasher loads

*Fully load dishwashers before running the wash cycle and ensure items are correctly stacked to make maximum use of space.*

### Use appropriate wash program

*Make sure the wash program is suitable for the utensils being washed and the level of soiling (time and temperature). Use economy settings where possible.*

### Consider use of sanitising liquids

*Using low temperature sanitising liquids enables use of lower temperature settings on your dishwasher. Ensure dosing of detergents and rinse aid is measured effectively.*

### Heat water with gas

*You will have substantial hot water use. If this water is heated by electricity, investigate switching to heating with gas, as this will cut costs and associated carbon emissions.*

### Avoid unnecessary hot water storage

*Check hot water heating timers for kitchen and make sure that the water is not being heated after the kitchen has finished use for day*

### Do not wash under running water

*Avoid washing utensils or produce under running water this will increase your utilities bill and carbon emissions (especially if the water is heated).*

### Report leaks and dripping taps

*If you notice water leaks or dripping taps, report the problem to your site manager.*



# TARGET AREAS

Regular cleaning for optimum performance

*Carry out regular cleaning and maintenance checks to ensure the equipment is working to its maximum capacity.*

Consider installing air-to-water heat recovery equipment

*School kitchens expel large quantities of heat but over 50% of this lost heat can be recovered. Air-to-water equipment turns this lost heat into a hot water source.*

## Catering - Heating, Ventilation and Lighting

Good kitchen ventilation and lighting is a very important part of ensuring a comfortable and safe working environment, but will also contribute to a large proportion of the kitchen's energy consumption.

Minimise use of ventilation

*To prevent odours and contaminants from the kitchen permeating into adjoining areas, such as dining rooms, kitchens will usually have extract canopies and/or fans which draw large quantities of air out of the kitchen. This air is quite often replaced from adjoining areas which are heated and this can lead to large quantities of this heated air being wasted. To avoid this, care should be taken that ventilation systems are used only when required and that when they are switched on the following two points are also considered.*

Ensure control settings reflect demand

*Ensure extract canopies and associated supply systems are only fully operational when the equipment beneath them is being used, i.e. during cooking or dishwashing. Ventilation does not usually need to operate at full capacity all the time, so make use of any controls that will adjust the speed of supply and extract fans to reflect the requirements of the space at different service times, such as when prep work or cleaning-up is being carried out.*

Do not use cooking equipment to heat the room

*Ovens, burners etc should not be used to heat the kitchen area, if the room is too cold at the beginning of the day speak to your site manager about adjusting the heating system.*

Is the extract hood correctly positioned?

*Check that all your major heat, steam, grease or other pollutant producing equipment is suitably positioned beneath the extract canopy otherwise the system will be a lot less efficient at removing these contaminants, which will impact both upon the quality of the working environment and also the energy consumption of the ventilation system.*

Regular cleaning for optimum performance

*Kitchen extract hoods and grease filters should be cleaned at regular intervals as efficiency can reduce by up to 50% in systems that are not maintained properly. Follow the manufacturer's guidelines on cleaning ensure a suitable planned preventative maintenance/cleaning regime is in place for all system components to maintain maximum efficiency and prevent breakdowns.*

Remove unnecessary lights

*Take a look around your catering facility and check whether any lights can be permanently removed (for example, if they are above extract hoods, fridges, vending machines and only lighting the top of the equipment).*

Switch off policy

*Is someone nominated to check all catering & heating equipment is turned off at the end of every lunch period? Unused large catering equipment can very quickly consume all your reserves.*



# TARGET AREAS

*Include the kitchen area in any school switch-off campaigns. Agree with staff to switch off lights when they are not required (i.e. When there is sufficient daylight or when an area is unoccupied). In particular this is likely to apply to any storage areas, the servery and eating areas.*

Regular cleaning for optimum performance

*Due to the nature of kitchen environments lights can quickly become dirty, and should be regularly cleaned to ensure maximum light output.*

Replace energy-eating equipment quickly

*School kitchens are high activity spaces. Inefficient kitchen equipment will be using unnecessary energy day after day. Replacing inefficient equipment for "A" energy-rated can have surprisingly quick payback periods - especially for dishwashers, fridges and freezers.*

## SWIMMING POOLS

If you have a swimming pool, contact us for specialist advice on energy saving for this high energy use facility

## BUILDING FABRIC

Every school is different. BUT around two-thirds of the heat from a typical school is lost through the building fabric (walls, floors and ceilings).

You may not be able to change a problem area this week, month or year, but you can gradually improve the energy performance of your building fabric and you can calculate what actions will bring the best savings and how quickly. It is also possible to benchmark your energy usage against schools of a similar size, design and age. (See section 3a)

So, the first step to reducing your energy use is understanding the unique strengths and weak areas of your school building fabric, and then having a plan of how to address them over a period of years.

**Have you thought about borrowing / renting / purchasing a thermal imager that could show where heat loss is greatest?**

This is a great STEM learning opportunity - see the appendices section for how one school made big changes from just one afternoon of heat exploring.

## Regular Housekeeping Schedule

Conduct a regular walk around using a checklist (see **Resources**) to check conditions of window panes and frames, skylights, roofs, skirting and eaves.

Keep an eye out for damp. Not only will it destroy the building structure but it also reduces insulating properties.

Deal quickly with gaps and snags in the building fabric

## Insulation

Effective insulation and draughtproofing is essential to reduce heat loss from buildings, as well as limiting noise and airborne pollution. Most buildings have scope for improvement. Good insulation is best fitted during the construction or refurbishment of a building when it is more cost effective and less disruptive. However, additions at any point ARE ALWAYS energy saving.

What percentage of roof spaces are insulated and how deep is the insulation?



# TARGET AREAS

*Having a rolling programme of insulating can make a big difference for a small annual outlay. Prioritise the coldest areas.*

Are your walls and roofs well-maintained?

*Insulation can only do so much! A repair “stitch in time” saves a huge energy bill!*

Is the temperature generally consistent throughout the building?

*Identify where the fluctuations are and what could be causing them. It is often cheaper to deal with an issue straightaway, for example a particularly draughty doorway or boiler with no reflective backing to wall, than it is to bear the heat loss day in, day out.*

Look at roof lines on a snowy or frosty day!

*You will quickly spot the uninsulated spots where snow is not settling.*

## Draughts

Operable windows in generally good condition can be draught-stripped to reduce heat loss.

*Do the penny test - If a penny coin can slide between a window and its frame, draught-proofing will be cost effective and improve comfort.*

Keep doors closed between heated and unheated areas

*All external doors should be kept closed when heating or cooling systems are in operation. Consider fitting automatic closers to external doors and to internal doors that separate areas with different heating or cooling requirements. This is a relatively inexpensive measure which can usually be carried out by on-site maintenance staff.*

Consider adding a lobby to cut down on heat loss.

*Installing a draught lobby at frequently used entrances can reduce heating costs and draughts. Where possible, the two sets of doors should have automatic control.*

Do door closers work properly?

Are doorways blocked by furniture or doorstops?

*This again comes down to helping staff understand the way your whole school building works as a machine. What can seem an obvious action in one place or condition, for example holding a door or window open, can actually be counterproductive by confusing sensitive cooling/heating sensors or be taking the most expensive of options.*

Are windows closed as a default position? Are superfluous windows sealed closed?

*Thermal imaging can emphasise just how much of your building heat disappears out of windows.*

## Radiators

Are radiators zoned and/or independent of each other?

Ensure radiators are unobstructed

*This will increase circulation of heat. Radiators, fans and ducts should be clear of furniture and other obstructions.*

Fit thermostatic radiator valves

*If your radiators are on full without any form of regulation, you could be overheating a room and increasing your heating bill.*

Could radiator efficiency be improved?



# TARGET AREAS

*For example, by placing reflective material behind them, moving them to different part of the room, updating them to more fuel efficient models.*

Are single radiators and electric heaters turned off and checked regularly?

*This is particularly an issue in isolated areas (mobile classrooms, kitchens, changing rooms) and regularly used spaces for which no one person takes responsibility (halls, libraries, dining rooms)*

Closing blinds and curtains at night - all year

*In summer months this measure can reduce heat in rooms receiving direct evening sunlight; in winter it keeps more residual heat in the room.*

## More radical thoughts...

Do you have pitched roofs that could hold solar (heating water) or photo-voltaic (producing electricity) panels?

*Solar panels can be up-cycled from old radiators and old fridge parts - see appendices and involve your D&T department.*

Could heat (e.g. from the kitchen) be recovered to heat the rest of the building or the hot water tank?

Could you install wind energy generating systems and/or heat pumps?

*As well as saving money they can be very useful in curriculum work and for publicising the school's sustainability and energy-efficiency values.*

