



## Resource efficiency checklist – opportunities to reduce energy, water and waste generation.

This checklist will help you identify some of the more obvious opportunities for resource efficiency in your organisation. Use it as you walk around your premises and tick where you think there are changes that can be made to improve efficiencies and save money.

### Energy efficiency

#### Heating, ventilation and air-conditioning (HVAC)

Action	For action	Complete
Ensure heaters and radiators are not covered or obstructed so they can heat a room effectively.		
Ensure refrigerators and freezers don't have to work harder than necessary to maintain the desired temperature - locate them away from cookers and other heat sources.		
Ensure there is a 'dead band' between heating switching off and air-conditioning switching on; set controls so that there is no heating above 22°C and no cooling below 25°C. This will stop heating and ventilation systems competing against one another.		
Use doors and windows as natural ventilation in summer instead of powered ventilation.		
Ensure cold-room doors are not left open for longer than necessary to keep the cold air in.		
Ensure external doors are kept closed in cold weather to keep the heat in.		
Fit draught excluders and automatic closing mechanisms to doors where appropriate. A door with a 3mm gap lets in as much cold air as a hole in a wall that is the size of a brick.		
Consider replacing your boiler if it is over 12 years old. Find out the efficiency of your current boiler on the <a href="#">SEDBUK database</a> . Modern boilers are now around 90% efficient.		
If your boiler room feels hot, then the pipework, valves and flanges may need to be insulated. If insulation is already fitted, then it should be inspected to ensure it hasn't been damaged or become saturated with water.		
Install destratification fans in buildings with high ceilings, such as warehouses, to blow warm air down from ceiling spaces where heat collects.		

## Lighting

Action	For action	Complete
Ensure lighting controls are clearly labelled so that staff know how to turn off lights in areas where there is no or low occupancy and are not fearful of turning off the wrong ones.		
Ensure automatic lighting control sensors are cleaned to improve their effectiveness.		
Clean windows and skylights to make maximum use of natural light and minimise the use of artificial lighting.		
Clean lamps, fixtures and diffusers to optimise the light emitted from lamps.		
Replace tungsten filament and halogen lamps with energy efficient alternatives. Typically, compact fluorescent lamps and slimline tubes can reduce lighting bills by 50% and they last 10 times longer.		
Where appropriate, use light emitting diode (LED) lamps. They have an even longer lifespan than compact fluorescent lamps and use at least 80% less electricity than an equivalent tungsten filament lamp.		
Install motion sensors to control lights in areas with low occupancy such as toilets, hallways and storerooms.		
Install daylight sensors to control the artificial light levels in rooms that receive large amounts of natural light.		

## Equipment

Action	For action	Complete
Turn off equipment when not in use, this removes 'phantom loads' – it's estimated that only 5% of the energy used by mobile phone chargers is actually used to charge phones.		
Install variable speed drives (VSDs) to electric motors where appropriate. Around half of all motor applications have some kind of varying demand. Using a VSD to slow down a fan motor from 100% to 80% can reduce energy use by up to 50%.		
Automate processes that have standard run cycles. If your process sequence can be programmed to an optimum setting it will always be more efficient than a human operator controlling it.		
Implement a feedback system so that staff can report damage and equipment breakdowns. If a process control system needs frequent repair and maintenance, then this may be a sign that it was poorly designed or it is reaching the end of its useful life.		
Minimise life-cycle costs by buying energy efficient equipment. Equipment listed on the <a href="#">Energy Technology List</a> is eligible for an Enhanced Capital Allowance.		
Install timer switches on equipment that can be turned off at night.		

For example, vending and coffee machines, photocopiers and printers.		
Set up photocopiers to go into hibernation or sleep-mode automatically when they have not been in use for a period of time.		
Install a programme that enables staff to switch-off their PC monitors with a single mouse click or set-up monitors to switch-off automatically when they have not been in use for a period of time.		
In offices with large numbers of staff, consider installing a efficient thermostatically controlled hot water boiler or urn for hot drinks rather than continually boiling water from cold in a kettle. Ensure this is also on a timer that switches it off out of working hours.		

## Billing

Action	For action	Complete
Large electricity users will have a supply capacity (SC) and maximum demand (MD) indicated on their bills. Talk to your supplier to reduce associated standing charges if SC is consistently over 25% greater than MD.		
Large electricity users will have a power factor between 0 and 1 indicated on their bill. If this number is below 0.9, it is worth investigating power factor correction equipment with the help of an approved electrician.		
Charging batteries and forklift trucks at night if you have dual-rate electricity (different billing rates for on-peak and off-peak) will generally result in a saving of between 30% and 40% per unit of electricity consumed.		
If you are billed through half-hourly metering (the MPAN number on your bill will begin with 'S00' if this is this case), contact your electricity supplier to gain access to the data that they collect on your energy consumption.		
Review your utility supply contract each year to ensure that you are on the most cost-effective tariff, or whether switching suppliers may be worthwhile.		
Ensure that your bills are based on actual meter readings, rather than estimated, to ensure that you are only billed for what you actually use.		
Take electricity and gas meter readings weekly or fortnightly as this will enable you to more accurately monitor your performance and identify improvements.		

## Waste and raw materials

### Office waste

Action	For action	Complete
Establish a central location for storing stationery items such as staplers and hole punches. These can then be shared, thus avoiding having to buy several items of the same type so that each person has their own.		
Re-use envelopes where possible, particularly if sending mail internally.		
Assign responsibility for ordering stationery to just one person so that duplicated orders are avoided and to maintain better visibility of consumption and waste.		
Consider whole-life costs (the costs of purchase, lifetime use and disposal) in all procurement decisions and whether you need to purchase the product at all (e.g. can you lease it instead?).		
Confidential shredding is an expensive way of dealing with paper waste. Establish procedures to ensure that confidential and non-confidential waste are segregated and recycled separately to reduce costs.		
Desk bins make it too easy for people to avoid preventing, re-using or recycling waste. Remove them and replace with centrally located bins with provision for segregation of recyclable materials.		

### Printing

Action	For action	Complete
Ensure that all printers are set to double-sided printing as default. If this is not possible, actively promote how to change the settings so that staff can do this before they print anything.		
Remove desk printers as these make it easy for people to print without thinking. Replace with centrally located printers.		
Install a 'hold print' system that releases printing only if an identity card is scanned or a password is entered at the printer. This reduces the amount of unnecessary printing.		
Where possible, arrange for printer cartridges to be refilled by your supplier.		
Consider where electronic communications could be used instead of hard copies. For example, display meeting agendas through a projector rather than printing out and use email marketing rather than leafleting.		
Avoid overproduction of publicity material by reviewing distribution lists to remove out-of-date contacts. Avoid putting specific dates on		

materials to extend their shelf life.		
Consider carefully where you put paper recycling bins to make it easy for people to recycle (e.g. put them next to printers).		

## Supply chain and waste contractors

Action	For action	Complete
If you are charged per uplift of your bins and they are often not full, speak to your waste contractor about reducing the frequency of collection and/or the size of containers to reduce costs.		
If you have significant quantities of certain materials, consider whether purchasing or leasing a compactor or baler would be worthwhile to reduce the number of bin uplifts and costs.		
Talk to suppliers about switching to re-usable or returnable packaging to avoid disposing of materials such as wooden pallets and cardboard boxes.		
Request unbranded boxes from suppliers so that you can add your own branded sticker and re-use the boxes for your own products.		
Use clear bin bags so that your cleaners and other staff can monitor and report on contamination levels, allowing recurring problems to be addressed.		
Specify a standard size for pallets on which your products or raw materials are delivered so you can re-use them to distribute your own products. If pallets are damaged, try repairing them before recycling.		
Get clear guidance from your waste contractor on what materials they can and cannot accept for recycling, and ensure staff are aware of this.		
Use the <a href="#">Business Resource Centre</a> to find waste contractors in your area that can collect the waste streams your organisation produces.		

## Food and drink

Action	For action	Complete
Replace single-use catering supplies such as plastic and paper cups, stirrers and sachets with re-usable or refillable alternatives. Check if the settings on hot drinks vending machines can be changed to accept re-usable containers (e.g. ceramic mugs).		
Rotate perishable stock and discuss lead times with suppliers to avoid wastage.		
Review portion sizes and consider asking customers whether they		

would like salad garnish instead of giving it to them automatically.		
Reduce the amount of food that is left on plates by training staff so that they are able to inform customers about portion size, ingredients and cooking techniques.		
Reduce waste from food preparation by serving vegetables and fruit with skins on (e.g. skin-on chips) and by using unavoidable fruit and vegetable peelings in smoothies and soups).		

## Water

Action	For action	Complete
Ensure dishwashers are used only when they are full. A part-filled machine uses as much water as a fully loaded one.		
If your toilets were installed more than 10 years ago, explore the possibility of using cistern volume reducers or dual-flush mechanisms to reduce water consumption. Consider water efficient toilets when refurbishing.		
Perform a water-use survey by taking a meter reading when everyone has left the building and again before people arrive for work (e.g. in the evening and then the following morning). Any consumption that you cannot account for may require further investigation.		
Sweep up spilt items instead of washing them down the drain.		
Install flow reducers or aerated adapters to taps to reduce water consumption. Fitting a tap aerator, at a cost of £5/tap, could result in water and sewerage savings of £13/tap/year.		
Regularly test percussion taps to check they are operating correctly. Short bursts requiring several pushes or taps that are slow to turn off indicate that repair or replacement is required.		
Check for dripping taps as part of your maintenance schedule. A new washer may be all that is required and fixing three dripping taps could save £32 a year.		
Wastewater charges are typically calculated on the assumption that 95% of the water you draw goes to sewer. If a lot of the water you use goes into your products or evaporates, you should contact your supplier and discuss the possibility of a lower charge.		
Non-industrial water users should have a meter size of 15-20mm. If your meter is larger than this, but you do not use water for any industrial purpose, contact your water company as it may be possible to reduce your standing charge.		

## Staff engagement

Action	For action	Complete
Set up a meeting with senior managers to present the business case for change and gain their commitment for improvements to be implemented.		
When presenting to senior management, illustrate your data with graphs, forecast the rising cost of inaction and calculate payback periods for any investment required.		
Obtain sign-off for aims, objectives and targets, and agree on the allocation of time, staff and financial resources.		
Set up a Green Team to provide support in implementing improvement actions and raising awareness.		
Recruit people for the Green Team from a range of departments, with different levels of seniority and skills. If possible, include suppliers and sub-contractors such as cleaners and waste contractors.		
Follow the 4Es of behaviour change: Enable, Engage, Encourage and Exemplify (refer to the Green Champions Training Course at <a href="http://www.resourceefficientscotland.com">www.resourceefficientscotland.com</a> for more information).		
Provide and actively promote a suggestions box to enable staff to submit ideas for improving resource efficiency. Ensure suggestions are followed up and progress is fed back to staff.		
Highlight resource efficiency at team meetings to maintain awareness and motivation.		
Establish a resource efficiency training plan for all staff (including induction and regular update training) to ensure that employees have the awareness and skills to take action.		
Include resource efficiency messages and successes in your company newsletter and email updates.		
Establish a dedicated noticeboard for communicating resource efficiency messages. Don't forget to refresh it regularly.		
Plan to deliver a variety of communication activities to ensure that you reach all stakeholders (e.g. awareness days, emails, briefings, posters, noticeboards, competitions, reminder stickers or re-usable mugs).		
Plan your staff engagement campaign over the long-term to allow time for new behaviours to embed. Monitor and evaluate the performance of your campaign so that you can celebrate and replicate successes or, if needed, take corrective action.		
Link internal communications to existing national campaigns to add credibility (e.g. <a href="#">Recycle for Scotland</a> ).		
Make employees aware that resources such as water and energy are metered, and not charged at a fixed rate, so even small reductions in consumption will reduce costs.		