**Energy audit**

**checklist**

For any organisation to begin reducing its energy use, and therefore costs, a good understanding of how you currently use your energy is essential.

The first step towards identifying and prioritising reduction opportunities is to carry out an energy audit.

This template energy audit checklist will allow you to deliver a systematic audit of all areas of your organisation to ensure you can identify and prioritise the areas your organisation can save energy and money. Some observations may be rectified by simply communicating with staff and changing some practices, where others may require repair or replacement of equipment or the installation of something completely new.

The checklist is divided into the main elements that can be included in a full energy audit. You can choose which sections of this template, and which checks within them, apply to your organisation and which don’t.

**Safety first**

Make sure you have carried out an assessment of any risks that may be present, and follow the safety procedures and methods that are in use. Always wear protective clothing and equipment where appropriate, and call in an expert when needed.

Audit date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Completed by: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| **Heating, ventilation, and air-conditioning (HVAC) equipment** | | | |
|  | **Completed (y/n)** | **Observation** | **Opportunity** |
| What is the age and condition of your boiler or other heat source? Would it be beneficial to upgrade? |  |  |  |
| Is the system regularly serviced/maintained? |  |  |  |
| Is the heating system appropriately designed? Could it be simplified? |  |  |  |
| Is the boiler and associated pipework well insulated? |  |  |  |
| Are radiators fitted with thermostatic radiator valves (TRVS)? |  |  |  |
| Have variable speed drives been fitted where possible? |  |  |  |
| Are all heat emitters such as radiators, fan units and storage heaters unobstructed (for example, are filters and grills clean, and is furniture clear of radiators)? |  |  |  |
| Are there any areas of over or under heating? |  |  |  |
| Are any staff supplementing the heating with electric heaters? |  |  |  |
| Are local thermostatic controls appropriately set (including frost protection)? |  |  |  |
| Are thermostatic controls placed in sensible places (not in direct sunlight/behind furniture, etc)? |  |  |  |
| Have timers been set to match the hours of occupancy? |  |  |  |
| Have heating and ventilation controls been set to provide a dead-band? |  |  |  |
| Is there a risk of heating and cooling operating in the same area? |  |  |  |
| Are any unoccupied areas being heated? |  |  |  |
| Are windows and doors often left open in air-conditioned spaces? |  |  |  |
| Does your building have heated high-bay spaces? |  |  |  |
| Are ventilation fans and motors as efficient as possible? |  |  |  |
| Does extract ventilation run when not needed? |  |  |  |
| Are ventilation fans properly maintained and cleaned? |  |  |  |
| Is exhaust-air heat recovery installed? |  |  |  |
| Are air flow rates effectively controlled (for example, variable speed drives rather than manual dampers)? |  |  |  |
| Does the building have ventilation and air-conditioning systems in place? |  |  |  |
| Is the air-conditioning used below 24°C? |  |  |  |
| Are air-conditioned spaces thermally separated from spaces that are not air-conditioned? |  |  |  |
| Are windows left open in air-conditioned spaces? |  |  |  |

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| **Hot water** | | | |
|  | **Completed (y/n)** | **Observation** | **Opportunity** |
| What is the age and condition of water heating equipment? |  |  |  |
| Have controls been set to match occupancy? |  |  |  |
| Are hot water cylinders and valves fully insulated? |  |  |  |
| Are all hot water distribution pipes insulated? |  |  |  |
| Have efficient taps and shower heads been fitted? |  |  |  |
| Are electric immersion heaters used (usually in summer)? Are these effectively controlled? |  |  |  |
| Is the volume of storage/number of tanks suitable for the demand? |  |  |  |
| Is the temperature of hot water suitable (consider legionella requirements)? |  |  |  |

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| **Building fabric** | | | |
|  | **Completed (y/n)** | **Observation** | **Opportunity** |
| Is the roof insulated to modern thermal standards? |  |  |  |
| Are there any uninsulated cavity walls? |  |  |  |
| Are there signs of dampness anywhere? |  |  |  |
| Are windows at least double-glazed or secondary glazed? |  |  |  |
| Are there any air leaks at windows and doors or other openings? |  |  |  |
| Are windows and roof lights clean? |  |  |  |
| Do all doors close automatically and quickly? |  |  |  |
| Is the space available used in an efficient way? |  |  |  |
| Do you have loading areas with doors left open (potentially for vehicle access)? |  |  |  |
| Are there any areas of solar gain? Is this capitalised on or does it cause an overheating issue? |  |  |  |

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| **Lighting: lamps** | | | |
|  | **Completed (y/n)** | **Observation** | **Opportunity** |
| Are there any areas of over-lighting or under-lighting? |  |  |  |
| Are there any tungsten lamps still in use (for example, in desk lights)? |  |  |  |
| Have T12 or T8 fluorescent lamps been replaced by lower energy alternatives? |  |  |  |
| Can halogen lamps be replaced by CFL or LED versions? |  |  |  |
| Can light output be reduced in any exterior lamps? |  |  |  |
| Are lamps and reflectors/shades dirty or discoloured? |  |  |  |

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| **Lighting: controls** | | | |
|  | **Completed (y/n)** | **Observation** | **Opportunity** |
| Are there any unused areas being lit? |  |  |  |
| Can occupancy sensors control intermittently used areas? |  |  |  |
| Are there large banks of lighting controlled by single switches? |  |  |  |
| Can daylight sensors be fitted to lights adjacent to windows? |  |  |  |
| Are windows and skylights cleaned regularly? |  |  |  |
| Are manual switches accessible and clearly labelled? Are staff aware of which switches control which lights? |  |  |  |
| Is there a switch-off policy in place? |  |  |  |
| Are all exterior lights controlled by timers or daylight sensors? |  |  |  |

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| **Compressed air** | | | |
|  | **Completed (y/n)** | **Observation** | **Opportunity** |
| Are compressed-air leak checks carried out regularly and any leaks fixed? Are there any leaks now? Pay special care to connectors and flanges. |  |  |  |
| Is compressed air used only where there are no other alternatives? |  |  |  |
| Is the compressor taking in the coolest possible air? |  |  |  |
| Is the pressure as low as it can be? Most cylinders can operate at 6 bar and some tools are designed to be operated at 4 bar or less. |  |  |  |
| Is the heat generated by the compressor used for heating in another area (for example, space heating or process heating)? |  |  |  |
| Is the compressor only switched on when there is demand for compressed air? (Leaving equipment idling costs money). |  |  |  |
| Are there any distribution pipe runs that are not in use? |  |  |  |
| Are there any manual condensate drains? Are they properly controlled? |  |  |  |
| Could the distribution network be zonally controlled? |  |  |  |

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| **Electric motors** | | | |
|  | **Completed (y/n)** | **Observation** | **Opportunity** |
| Is all driven machinery serving a useful purpose? |  |  |  |
| Are motors correctly sized for purpose? |  |  |  |
| Are any motors left running when the process demands have stopped? (Idling motors can still use a significant proportion of their rated capacity and hence waste energy). |  |  |  |
| Are inverters or variable speed drives used for any motors that drive variable process loads? (The best examples are often found in fan and pump applications). |  |  |  |
| Are motors with high annual operating hours energy efficient motors, such as Efficiency Class I (Eff1) or IE3? |  |  |  |
| Are motors kept clean? (When their cooling fins are kept clean, motors run cooler, more efficiently and will be less prone to breakdown). |  |  |  |
| Are transmission systems well maintained and in working order? (Such systems can include transmission belts, gearboxes, bearings and pulleys). |  |  |  |
| Are voltages properly balanced? Is the power factor as high as possible? (You’ll need electrical instruments to measure these). |  |  |  |

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| **Steam** | | | |
|  | **Completed (y/n)** | **Observation** | **Opportunity** |
| Are steam leak checks carried out regularly and any leaks fixed? Are there any leaks now? It is also important to have regular steam trap tests conducted as these can leak steam into the condensate return pipework. |  |  |  |
| Is the insulation on steam pipework, valves and fittings complete and in good order? |  |  |  |
| Check that the burners are operating efficiently by having a combustion efficiency test carried out. Compare the results against the manufacturer’s specification. Too much air results in increased energy consumption and running costs. |  |  |  |
| Are automatic temperature controls installed on process machines? |  |  |  |
| Is all condensate returned to the boiler? Is the condensate pipework insulated properly? |  |  |  |
| Is appropriate heat recovery equipment installed in the boiler flue? |  |  |  |
| Does the system have automatic total dissolved solids (TDS) control? |  |  |  |
| Are there any distribution pipe runs that are not in use? |  |  |  |
| Is flash steam re-used? |  |  |  |

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| **Other equipment (for example IT and refrigeration)** | | | |
|  | **Completed (y/n)** | **Observation** | **Opportunity** |
| Is all equipment as new and energy efficient as possible? |  |  |  |
| Does all IT equipment have energy saving features enabled? |  |  |  |
| Is all other equipment switched off when not in use? |  |  |  |
| Have lifts been assessed by an expert in lift energy efficiency? |  |  |  |
| Is all refrigeration equipment A-rated or better? |  |  |  |
| Is refrigeration equipment properly cleaned and maintained? |  |  |  |
| Is refrigeration equipment properly used (for example, is it running at an appropriate temperature and filled to right levels)? |  |  |  |
| Are vending machines and coolers fitted with timers? |  |  |  |

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| **Staff awareness** | | | |
|  | **Completed (y/n)** | **Observation** | **Opportunity** |
| Are there posters/guidance displayed to remind staff of good practice? |  |  |  |
| Is energy efficiency included in staff induction training and regularly revisited? |  |  |  |

The answers to the questions raised in the Energy Audit Checklist should leave you with a list of observations and potential actions to investigate further.