



**ECA**

Excellence in Electrotechnical  
& Engineering Services

# Energy Saving and Carbon Reduction Customer Checklist



## Who this checklist is for..

This checklist is intended to help you, the customer, to discuss the scope for further energy saving measures\* with your ECA member contractor.

The emphasis is on measures that can be applied in commercial or public premises, including those which may require extension or major refurbishment. In addition to installation, these measures may also include design, commissioning and maintenance.

The checklist is presented as a hierarchy of 10 groups of measures – eg lighting, device management or energy sources – with generally speaking, the simplest measures first\*\*. Each group then shows example technologies or other measures. Again, these are broadly in order of increasing complexity.

This document refers to over 50 potential measures in all.

For those measures which may be applicable to your premises, your ECA member contractor can discuss energy performance, practical considerations and 'payback' times (return on investment, based on energy savings or other incentives).

### Notes:

\* 'Energy saving measures' means:

1 - saving you money because you will need to buy less energy from your supplier, and (in most cases)

2 - reducing your 'carbon footprint' (you will need less energy provided by burning fossil fuels - eg less energy from the grid or the gas supply)

\*\*The order shown in the checklist is only a guide. The *actual order* for you, the customer, will naturally depend on various job-specific considerations.



ENERGY SAVING/CARBON REDUCTION MEASURE	KEY POINT(S)	POSSIBLE APPLICATIONS IN YOUR PREMISES
<b>1. LIGHTING</b>		
Switch off when room unoccupied.	No cost.	
Maximise use of natural daylight.	No operational cost.	
Good lighting maintenance, keep luminaires clean. Select suitable diffusers.		
Lamp choice (internal and external) - includes LEDs.	Often highly cost effective. LEDs can deliver significant energy savings.	
Occupancy sensors.	Low installation cost.	
Daylight sensors.	Low installation cost. Can be combined with occupancy sensors.	
Replace magnetic ballasts with high frequency electronic ballasts.	Rapid payback possible.	
Replacement luminaires.	Can be very cost effective.	
Dimming systems.	Can be cost effective, notably when coupled to daylight occupancy sensors.	
Lighting controlled by Building Management System (BMS).	Can be cost effective.	
<b>2. HEATING</b>		
Adjust thermostats (heating, cooling and hot water).	No cost.	
Switch off when room unoccupied.	No cost.	
Adjust data centre/service room to optimum cooling temperature.	No cost. Applies to cooling.	

ENERGY SAVING/CARBON REDUCTION MEASURE	KEY POINT(S)	POSSIBLE APPLICATIONS IN YOUR PREMISES
Regular HVAC servicing.	Low Cost. Ensures that the HVAC is performing efficiently and effectively and addresses issues before they become a significant problem.	
Heating on timed/programmable control.	Can be cost effective, payback can be less than a year - depending on previous use.	
Heating on BACS control.	Often cost effective - especially with other measures such as energy efficient lighting.	
Sensor control as part of BACS.	Used with BACS, can deliver cost effective energy efficient systems.	
Electric storage heaters.	If property is off grid (no gas) can offer savings on heating costs when used with off peak / time-of-use tariffs	
<b>3. DEVICE MANAGEMENT</b>		
Switch off computers, monitors, photocopiers etc. at night/during holidays.	No cost.	
Set appliances to revert to energy saving mode at end of day (where possible).	No cost.	
Local energy monitoring.	Low cost, but often required for optimal control.	
Control devices from local timers (eg drinks machines turned off).	Can be cost effective.	
Devices controlled from central timer or occupancy switch.	Effective when part of major refurbishment.	
Replace desktop computers with laptops / low energy consumption computers where possible.	Can be effective when coupled with planned equipment upgrades.	
Power supply for equipment control as part of BACS system.	BACS controls power as part of overall control strategy. Carry out as part of major BACS installation.	

ENERGY SAVING/CARBON REDUCTION MEASURE	KEY POINT(S)	POSSIBLE APPLICATIONS IN YOUR PREMISES
<b>4. MOTORS AND DRIVES</b>		
Ensure all machinery / rotating plant is switched off if not required at end of working day.	No cost.	
Variable speed drives (to control air/fluid flow).	Can be very cost effective where reduced flow rates required for optimum performance. Energy recovery options are available at additional cost.	
Install energy saving modes to motors and machinery.	BACS can use sensor inputs to control motor speed to reduce energy usage.	
Identify replacement / investment program for major equipment - target 'energy hungry' equipment.	Replace outdated capital plant with modern, efficient systems. Can deliver good payback.	
<b>5. GENERAL POWER SYSTEMS</b>		
Ensure cables/equipment are not covered by building insulation.	Fire safety consideration-should be no cost - requires correct design and monitoring.	
Power Factor Correction (PFC).	Should be part of maintenance program. New installation can be cost effective, depending on energy tariff and power demand.	
Metering - centrally and at distribution boards.	Measure then control. Essential requirement for optimising energy use.	
'Smart' meter or Automatic Meter Reading (AMR) installation for main incomer and local sub-circuits.	Remote measurement and control possible.	
Voltage reduction/optimisation.	Cost effective technology for older or very inefficient systems.	
Overall integral control over data system or wireless.	High initial cost but can be cost effective as part of overall design.	

ENERGY SAVING/CARBON REDUCTION MEASURE	KEY POINT(S)	POSSIBLE APPLICATIONS IN YOUR PREMISES
<b>6. BUILDING</b>		
Solar shading (manual).	Often cost effective.	
Solar shading (automatic).	Higher capital cost, but a very effective energy saving measure.	
Insulation. Ensure that your building is correctly insulated and draft free.	Very effective energy reduction method. Ensure cabling etc. is not covered.	
Building Automation and Control System (BACS).	Can be a cost effective energy control system. See lighting, heating, small power, energy sources.	
Design and integrate energy saving layouts/systems.	Highly effective method of building energy control. Large design element.	
<b>7. ENERGY SOURCES (renewables/micro-generation)</b>		
Note: Renewable energy sources (such as PV) directly reduce your carbon footprint because the energy they produce does not involve burning fossil fuels. Renewables reduce operational costs by removing the need to buy the equivalent energy from your supplier.		
Photovoltaic (PV) cells.	Medium to long-term payback. Building to be suitable with south-facing, or east / west split roofs. Needs metering and inverter. The installer and products must be MCS certified to receive 'Feed-in Tariffs', for smaller systems. (available until April 2019) Coupled with battery storage, can help a building to be energy self-sufficient.	

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Heat Pumps (eg for heating).	Ground source heat pumps tend to be efficient but are very expensive to install (more suitable for new build projects and buildings with extensive external grounds). Air source systems require less capital expenditure and can be cost-effective where mains gas is unavailable. Renewable Heat Incentives may apply. To be eligible the installer and products must be MCS certified.	
Wind turbines.	Not usually cost effective in small sizes, or in urban areas. Needs metering and inverter. The installer and products must be MCS certified to receive any available 'Feed-in Tariffs', for smaller systems.	
Combined Heating and Power (CHP).	Can be long payback, depending on building use of heat and power. Needs specialist engineering input.	
Electrical Energy Storage	Medium to long-term payback. Batteries such as Lithium ion or other cells/electrolytes may be used with electronic systems to store excess energy from renewable sources. This can be used to reduce peak demand or supply power at times of peak cost, or possibly provide grid services.	
Integrated supply and demand.	Integrate energy sources, with supply and demand, via BACS.	
<b>8. COMPANY VEHICLES</b>		
Switching to electric or hybrid vehicles.	Can be cost effective with fleet/ vehicle replacements. Low to no road tax. May need to involve site charging capability.	

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<b>9. STAFF</b>		
Employee education. Inform all staff about energy saving opportunities, and encourage suggestions and feedback.	No cost: staff can be an excellent source of suggestions and can provide vital feedback on what is actually happening. Helps to achieve buy-in and supporting behaviour. Training staff in energy efficiency measures can be highly cost effective.	
Encourage tele-conferencing.	Variable cost. Reduces operational costs and CO <sub>2</sub> related to business travel.	
<b>10. GENERAL</b>		
Effective maintenance programme.	Needs to be in place as soon as possible to maximise impact.	
Display Energy Certificates (DECs) or other energy assessments.	Certificates displayed at entrance to building, or even 'live' energy display. Can provide a benchmark for energy efficiency measures.	
Talk to your energy supplier about tariffs and the 'carbon profile' of your energy (fossil fuel component).	No cost discussion: may provide cheaper or more flexible tariffs, and/or a better carbon profile. Possibly coupled with battery storage options, 'time of use' tariffs can offer considerable savings.	
Install 'Energy usage / generation ‡/ CO <sub>2</sub> reduction ‡' display meter. (‡ if applicable)	Low cost and can be coupled with other measures above. Displaying real time energy usage and savings can be a key driver to energy usage patterns.	
Implement an energy management system or scheme (such as ISO 50001).	Takes time and resource, with additional cost for certification if third party assessed, but can help deliver ongoing savings/ carbon reduction, and can achieve stakeholder recognition.	
Any further opportunities (please add)...		

### Important note:

This Energy Saving and Carbon Reduction Checklist provides general information, but legal, financial and other developments may alter or overtake some of the information provided. Customer and project-specific factors may affect the relative cost-effectiveness of various energy saving and carbon reduction measures, whether they are stand-alone or integrated with other measures. As such, this checklist is a basic guide to the measures available and is not intended to be, and should not be used as, the sole basis for making any commercial plans or decisions.

### Microgeneration Certification Scheme

The Microgeneration Certification Scheme (MCS) is supported by the UK Government. It is designed to evaluate products - and those who install them - against robust criteria. The scheme is open to firms involved in the supply, design, installation and commissioning of microgeneration technologies, including:

**Electricity generation technologies**

- Solar Photovoltaic (PV)
- Wind Turbines

**Heat generation technologies**

- Solar Heating
- Heat Pumps (Ground, Air Source)

**Co-generation technologies**

- Combined Heat and Power (CHP)

### About ECA

ECA is the UK's leading trade association that represents and supports the interests of businesses and organisations involved in electrotechnical and engineering services design, installation, inspection, testing, maintenance and monitoring across the United Kingdom (excluding Scotland).

Your ECA contractor .....

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