

# Commercial Energy Saving & Carbon Reduction Checklist

for Registered Members



Representing the best in electrical  
engineering and building services

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### Who this checklist is for...

This checklist is intended to help mainly smaller to medium ECA member companies raise and discuss energy saving measures\* with commercial and public sector clients. The emphasis is on measures that can be applied in existing (often small to medium sized) commercial or public premises, including those which require extension or major refurbishment. In addition to installation, these measures may also include also design, commissioning, inspection and maintenance (i.e. developing a service relationship).

Your checklist is presented in eight groups of measures (e.g. lighting, small power, energy sources) which are (broadly) in order of increasing cost and complexity. Each group then shows specific technologies or other opportunities. Again, these are broadly in order of increasing cost and complexity\*\*.

You may also find the checklist helpful when considering how to communicate with new clients.

### How to use the checklist...

The checklist highlights energy saving opportunities that you can discuss with an existing (or even an established) client, beyond the work which you have already done (or do) for them. Many ECA members find that they can introduce their clients to energy saving opportunities as part of a progression from 'low to no' cost to higher cost energy saving measures.

To use this checklist, select the work you currently do for a given client on the checklist, and then move through the rest of the checklist to find further energy saving measures to discuss with the client.

This (contractor's) checklist is accompanied by a 'Commercial Energy Saving and Carbon Reduction Checklist for *clients*'.

The client's checklist mirrors the headings in your own checklist, and it can be given to the client, notably following your discussions with them on energy saving measures. You can fill in various 'Possible applications in your premises' boxes for the client, for their reference. You should also note these in the relevant places on your own checklist (see 'Customer Interest').

Note that energy saving and carbon reduction equipment is often required to perform over many years to fulfill its energy/carbon reduction functions. Contractors should ensure they are communicating clearly with clients about the expected performance of equipment and that they have suitable indemnity, or have taken other suitable measures, to guard themselves against any equipment failures or unexpectedly reduced performance.

For each energy (or carbon) saving measure shown in the checklist, you can also obtain more information from the ECA, to help you discuss the measure authoritatively with clients.

### NOTES

\* 'Energy saving measures' mean 1) saving your client money because they will need to buy less energy from their supplier and (in most cases) 2) reducing the client's 'carbon footprint' (the client will need less energy provided by burning fossil fuels - e.g. energy from the grid or the gas supply).

\*\*The order shown in the checklist is only a guide. The actual order will naturally depend on the client's means and requirements, and job-specific considerations.

Reference to 'no cost' in this guide usually means no or minimal cost, and no capital outlay.

## COMMERCIAL ENERGY SAVING AND CARBON REDUCTION CHECKLIST

(the hierarchy below is based on factors such as typical capital costs and payback times)

Client's name .....
Client's contact details .....
Other information .....

**ECA Contractor Checklist - This checklist is for your own use (it is not intended to be given to the client).**

**A Client's Checklist is also available for you to present to the client after you have discussed possible opportunities.**

ENERGY SAVING/CARBON REDUCTION MEASURE	EXAMPLE TECHNOLOGY	KEY POINT(S)	OBSERVATION(S)	CUSTOMER INTEREST?
<b>1. LIGHTING</b>				
Switch off when room unoccupied	-	Advice, no cost		
Natural daylight	-	Advice, no cost	Use daylight where possible	
Good lighting maintenance, keep luminaires clean	-	Low cost, necessary and effective	Good practice	
Lamp choice (internal and external lighting)	LED, CFL, T5, etc.	Advice - design feature. Often cost effective	Choose lamp for efficiency and duty.	
Occupancy sensors	PIRs	Low installation cost	Switches off lighting when room unoccupied	
Daylight sensors	Available from electrical distributors	Low installation cost. Can be combined with occupancy sensors.	Switches luminaires off when enough daylight. Can also control luminaire dimming.	
Replacement ballasts	HF electronic ballasts	Rapid payback	No-flicker start and extends lamp life.	
Replacement luminaires	Better reflector, higher performance lamp	Can be very cost effective.		
Dimming systems	Can be a part of replacement HF ballasts	Can be cost effective, notably when coupled to daylight sensors.		
Lighting controlled by Building Management System (BMS)	Specialist BMS providers	Often cost effective	Lighting integral part of building management system control	
<b>2. HEATING</b>				
Adjust thermostats (for cooling or heating)	-	Advice, no cost	Ensure temperature settings are right for the application.	
Switch off when room unoccupied		Advice, no cost		
Adjust computer room A/C thermostat to maximum allowable	-	Advice, no cost	Modern IT equipment usually more resilient to temperatures. Check with IT department.	
Keep radiators clear and clean	Effective heat distribution	Advice, no cost		
Occupancy sensors	Available from electrical distributors	Some cost, but very effective	Turns off A/C or vented heating when room unoccupied	
Heating on timed/programmable control	Simple timers on systems	Often cost effective, payback can be less than a year - depending on previous use.		

ENERGY SAVING/CARBON REDUCTION MEASURE	EXAMPLE TECHNOLOGY	KEY POINT(S)	OBSERVATION(S)	CUSTOMER INTEREST?
Heating on BMS control	Controlled as part of the overall building management system	Often cost effective especially with other measures such as lighting	Boilers, pumps, fans control all integrated through BMS	
Sensor control as part of BMS	Individual room thermostats, humidity and CO <sub>2</sub> sensors.	Used with BMS can deliver Often cost effective energy efficient systems	Install as part of BMS system	
<b>3. SMALL POWER</b>				
Switch off computers, monitors, photocopiers etc at night/during holidays	Can be manual or by use of sensing modules	Advice, no cost	Good cost savings. User education required.	
Appliances switched to energy saving mode at end of day	-	Advice, no cost		
Local energy monitoring	Digital / analogue metering	Low cost but required for best control.	Measurement is required to ensure control.	
Control small power from local timers i.e. drinks machines turned off	Small individual timers	Often cost effective	Power supplied at agreed times	
Small power controlled from central timer or occupancy switch	Available from electrical distributors	Carry out as part of major refurbishment.	All small power in building centrally controlled.	
Power supply for equipment control as part of BMS system	Specialist BMS providers	BMS controls power as part of overall control strategy. Carry out as part of major BMS installation.	Ultimate control of power, integrated with building function	
<b>4. MOTORS AND DRIVES</b>				
Ensure all machinery / rotating plant is switched off if not required at end of working day		Advice, no cost		
Variable speed drives (to control air/fluid flow)	Specialist BMS providers. Smaller units available from electrical distributors	Very cost effective where reduced flow rates are required for optimum performance. Should be used with BMS	Large savings possible.	
Install energy saving modes to motors and machinery	Temperature, flow and production sensors used to control motor speed.	BMS can use sensor inputs to control motor speed to reduce energy usage.		
Energy recovery variable speed drives	If braking is part of motor sequence then a variable speed drive can extract energy from the motor and act as a brake. Sometimes known as 'four quadrant' systems	Only cost effective when energy recovery required.	Can reduce wear on conventional braking systems.	

ENERGY SAVING/CARBON REDUCTION MEASURE	EXAMPLE TECHNOLOGY	KEY POINT(S)	OBSERVATION(S)	CUSTOMER INTEREST?
<b>5. GENERAL POWER SYSTEMS</b> <i>(Note: you may also want to discuss the client's energy supply tariffs, with a view to assessing if they are getting the best energy deal)</i>				
Ensure cables are not covered by building insulation		Should be no cost - design correctly	Consult BS7671 for rating of cables.	
Power Factor Correction (PFC)	Standard capacitive PFC control.	Should be part of maintenance program. New installation can be cost effective dependent on tariff and power demand.	Should be installed as part of original design. Ensure it is maintained correctly	
Metering - centrally and at distribution boards	Digital or analogue	Measure then control. Essential requirement	Can be integrated into BMS or remotely monitored via internet	
'Smart' meter or Automatic Meter Reading (AMR) installation for main incomer and local sub-circuits	Use of GMS telephone or other data system for communication.	Remote measurement and control possible.	National program proposed for installation, from 2013. Individual 'Smart' meters or AMR can still be installed before then to provide valuable data on energy use.	
Voltage reduction/optimisation	Additional transformer used to reduce voltage to installation.	Often cost effective technology on older or very inefficient systems	If the customer owns HV system then transformer tapings can be altered to reduce output voltage.	
Overall integral control over data system or wireless	Examples KNX, IP, Echelon	Expensive to install but can be cost effective as part of overall original design.	Compatible IT systems required.	
<b>6. BUILDING</b>				
Solar shading (manual)	Simple blinds	Advice. Often cost effective	Use to reduce glare and heat into rooms from direct sunlight	
Insulation	Ceiling or cavity-type insulation.	Fire safety advice and implementation. Very effective energy reduction method.	Includes advice on safety of services covered by insulation and use of 'spacers' (allowing air around ceiling services)	
Solar shading (automatic)	Automatic/electrical blinds	High capital cost but very effective	Use to reduce glare and heat into rooms from direct sunlight	
Building management control systems (BMS)	Can be basic timer systems or full integrated control system for heating and power control.	Often cost effective energy control system.	Needs input from all building services.	

ENERGY SAVING/CARBON REDUCTION MEASURE	EXAMPLE TECHNOLOGY	KEY POINT(S)	OBSERVATION(S)	CUSTOMER INTEREST?
Design and integrate energy saving layouts/systems	Building design integrated from inception with energy efficient services.	Most effective method of building energy control. Large design element.		
<b>7. ENERGY SOURCES (renewables / micro-generation)</b>				
Heat Pumps (e.g. for heating)	Mainly 'air source' heat pumps, for retrofit applications.	Advice. Most cost effective if installed as part of original design.	Renewable Heat Incentive available for Ground source heat pumps. For smaller systems, the installer & products must be MCS* certified.	
Photovoltaic (PV) cells	Photovoltaic technology	Advice. Medium-to-long term payback	Building to be suitable with south facing roofs. Needs metering and inverter. Eligible for 'Feed-in Tariffs'. The installer & products must be MCS* certified.	
Wind turbines	Roof mounted or small scale on open ground.	Not usually cost effective in small sizes or in urban areas.	Needs metering. Eligible for 'Feed-in Tariffs'. The installer & products must be MCS* certified.	
Combined Heating and Power (CHP)	Integral with building	Advice. Can be long payback, depending on building use of heat and power	Needs input from all building services and requires specialist engineering input.	

Renewable energy sources (such as PV) directly reduce a client's carbon footprint because the energy they produce does not involve burning fossil fuels. Renewables also remove the need to buy the equivalent energy from a supplier, reducing operational costs. \*MCS (Microgeneration Certification Scheme)

<b>8. GENERAL</b>				
Effective maintenance programme	-	Advice and implementation Needs to be in place as soon as possible.		
Identify replacement / investment program for major equipment - Target 'energy hungry' equipment	Replace outdated capital plant with modern, efficient systems	Can deliver good payback		
Provide display energy certificates (DECs) or other energy assessments.	Certificates displayed at entrance to building or 'live' energy display in common areas of building.	Show effectiveness of overall energy efficiency measures.	Can be effective in prompting energy efficiency measures. DECs are relatively low cost but 'live' displays of energy on screens can be quite costly.	
Any further opportunities (please add)...				

## Microgeneration Certification Scheme

The Microgeneration Certification Scheme (MCS) is supported by the Department of Energy and Climate Change. 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, set to work and commissioning of microgeneration technologies, including:

### Cogeneration technologies

- Combined Heat and Power (CHP)

### Electricity generation technologies

- Solar Photovoltaic (PV)
- Wind Turbines

### Heat generation technologies

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

ELECSA - part of the ECA group of companies - is an approved provider of the Microgeneration Certification Scheme, for all the technologies above. For more information about the MCS or the ELECSA scheme, ring 0845 634 9043 or visit [www.elecsa.co.uk/](http://www.elecsa.co.uk/)

## About the Electrical Contractors' Association

The Electrical Contractors' Association (ECA) is the UK's leading trade association representing the interests of contractors who design, install, inspect, test and maintain electrical and electronic equipment and services. 'ECA Certification' is the ECA's UKAS accredited independent certification body.

### The ECA:

- Provides a comprehensive, range of tools and expert support services to its 3000+ Registered Members. ECA Registered members range from local contractors to national building services organisations with broad building services capabilities. Collectively, ECA members have an annual turnover of more than £5 billion, employ over 30,000 operatives and support 8,000 apprentices in training.
- Works with regulatory bodies, government and opinion formers to help build an efficient and sustainable industry, based on high standards of training and practice. Through representation and lobbying, the ECA actively leads on key issues including safety, sustainability, training, qualification and technological development.
- Has formed a number of strategic relationships with those who specify electrical and related work, to enhance the profile and promote the use of Registered Members.

### FOR MORE INFORMATION (REGISTERED MEMBERS ONLY) ON:

- **the energy saving and carbon reduction technologies in this checklist & their associated commercial aspects - contact ECA's Energy Solutions Helpline on 020 7313 4867**
- **available grants and other fiscal support, contact ECA's Safety and Environment Department on 020 7313 4817 or via [environment@eca.co.uk](mailto:environment@eca.co.uk)**
- **training and development in this area, contact ECA's Education and Training Department on 0845 872 5361**

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



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