



HM Government

A guide for businesses

Reducing the energy usage and carbon emissions
from your air conditioning systems



Buildings account for almost **half** of the energy consumption and carbon emissions in the UK.

The Air conditioning used in your building can amount to a **third** of your annual electricity cost. Older, oversized or poorly maintained air conditioning systems may be using more energy and costing more to operate than necessary.

Most businesses have rising energy costs. If you use energy efficiently in your business, you can save money, save energy, stay competitive **and** reduce carbon emissions from your building.

The main things that affect the energy efficiency of your air conditioning system are:

- The energy efficiency of your air conditioning equipment
- Whether your air conditioning system has been regularly maintained
- How your air conditioning system is controlled and operated

Air conditioning inspections are being introduced by the Government as part of the implementation of the Energy Performance of Buildings Directive in England and Wales, to give building owners and operators essential information about the energy performance of their air conditioning systems.

The information and advice will highlight possible improvements to:

- the energy efficiency of the system
- electricity consumption and operating costs
- carbon emissions



When are inspections being introduced?

Mandatory inspections are being introduced for all air conditioning systems with rated cooling output greater than **12kW**. This includes the combined output of one or more individual air conditioning units in a building.

If your air conditioning system has a rated output greater than **250 kW**, you must have had your first inspection by **4th January 2009**.

If your air conditioning system has a rated output greater than **12kW**, but less than **250kW** you must have had your first inspection by **4th January 2011**.

Thereafter, inspections will be required **every 5 years**. **This is now law.**

For new systems installed on or after **1 January 2008**, the first inspection must have taken place within 5 years of the installation date.

Who can do the inspection for you?

All inspections **must** be done by an accredited air conditioning assessor. They will provide you with a written report giving you advice and guidance on how to improve the energy efficiency of the system as soon as practicable after the inspection.

If you control a building with an air conditioning system that is affected by these Regulations, **you** are responsible for ensuring an inspection has been done by the deadlines and that you have a copy of the most recent inspection report.

If your responsibility for controlling the system passes to another person, you should provide them with any inspection reports you have. From **4th January 2011**, if you do not provide an inspection report the new person will be under a legal requirement to ensure the system is inspected within 3 months.

The inspection report should ideally be kept with ongoing maintenance records in the building log book.



What does an energy inspection cover?

An energy inspection of your air conditioning system involves a visual assessment of your air conditioning installation. The inspector will examine the equipment and, air movement systems and controls. Additionally, access to plant rooms or rooftop locations will be required. Following the inspection, the inspector will provide you with a report containing:

- The current efficiency of your equipment and suggestions for improvement including, where appropriate, its replacement
- A list of any faults identified (e.g. condition of air filters) during the inspection and suggested actions
- The adequacy of the equipment maintenance and suggestions for improvement
- The adequacy of the installed controls and control settings and suggestions for improvement
- The current size of the installed system in relation to the cooling load
- Suggestions for improving the system's energy efficiency, or, where appropriate minimising or avoiding the need for air conditioning

You are under no obligation to act on the advice provided in the inspection report. However, if you do so, it is likely you will reduce energy consumption and costs.

How can I check my air conditioning inspection is valid?

An energy inspection report can only be produced by an **accredited Air Conditioning Energy Assessor**. All **Air Conditioning Energy Assessors** must be a member of an accreditation scheme.

Accreditation schemes safeguard consumers by ensuring **Air Conditioning Energy Assessors** have the appropriate expertise to conduct energy assessment and also ensure inspection reports are of a consistent quality.

If you have any concerns regarding the quality or validity of your inspection report, you should contact your energy assessor in the first instance. If you are still not satisfied then you should contact your energy assessor's accreditation scheme. The name of your Energy Assessor and their accreditation details should be on your report.

Maintaining your air conditioning system

Energy consumption can increase by as much as 60% as a result of poor maintenance and dirty components. Regular maintenance checks will help ensure your air conditioning system is operating as efficiently as possible.

Your maintenance checklist should include:

- **Condensers.** Check condensers are unobstructed and always ensure condensing and evaporating devices are clean and well maintained
- **Refrigerant charge and leakage.** Check the refrigerant charge for air conditioning and comfort cooling plant regularly and examine joints for signs of leakage. Some refrigeration systems may also be subject to routine leakage testing requirements under the F-gas regulations EC No. 842/2006
- **Pipework insulation.** Damaged insulation on refrigerant pipework will consume more energy maintaining the required temperature. Replace any damaged sections and pay specific attention to pipework located outside a building
- **Fans, filters and air ducts.** Blocked filters lead to reduced airflow and increased operating costs. Check and clean fans, filters and air ducts, and consider fitting gauges that indicate when the replacement of filters is required
- **Thermostat calibration.** Calibrate thermostats annually to ensure they respond correctly to actual temperatures
- **Stay safes.** Keep heat exchangers and cooling towers clean and treated to save energy and prevent health problems such as Legionella



Operating your air conditioning system efficiently

Setting controls correctly and reducing the need for cooling will reduce the operating cost of your air conditioning system. Consider the following steps to improve energy efficiency of your air conditioning system:

Turn cooling thermostats up.

Set the temperature 'switch on' to around 25-27°C and ensure heating switches off at around 19°C so that the two systems do not operate simultaneously.

Match air flow rates to demand.

Excessive draughts can cause joint stiffness, headaches and a dry nose and throat. Ask your maintenance technician for options on how to improve the internal environment.

Switch off unnecessary electrical equipment.

Switch off computers and lights when not required.

Let the building cool overnight.

Ensure blinds are down at the end of the working day and open secure vents overnight, where possible.



Place heat-emitting equipment in a separate, naturally ventilated area.

Colder areas on the north side of buildings are ideal.

Service computer server rooms separately from the main system and cool only to the maximum temperature at which the equipment can operate effectively. Building occupants should be able to override these temperatures but controls should be reset when the area is vacated.

Keep windows closed when air conditioning is on. Blinds can be angled to reduce solar heat gains. Reflecting light on to walls and ceilings can reduce demand for electric lighting.

Use external shading to reduce the amount of light/heat entering a space. 'Louvres' can be retrofitted to buildings to provide shade during summer whilst allowing lower winter sun to penetrate the area.

Encourage staff involvement by demonstrating how they can be more in control of their own environment. Explain how thermostats operate and provide guidance on recommended operating temperatures, as well as guidance on how to operate heating or cooling units correctly. Display instructions on individual units and ensure that remote controls are accessible.

Keep a log book detailing control settings, maintenance information and, any records of the commissioning process. A comprehensive logbook helps users to develop a better understanding of a building's operation and management.

Monitor energy usage

Monitor your energy consumption by examining your energy bills and any other meters which have been installed. Some energy suppliers are able to provide "real time" consumption data for your building.



Investing in new equipment

Investing in new equipment is a big decision for most businesses. Tax relief may be available in the form of Enhanced Capital Allowances (ECAs). You also need to think about whether the proposed work means you will need to make more improvements as part of the consequential improvement requirement in the Building Regulations.

The Consequential Improvement requirement applies to proposed work in buildings over 1000m² which include:

- An extension
- The initial provision of any fixed building services such as heating, ventilation or air handling
- An increase to the installed capacity of any such fixed building service

If these apply then you may have to carry out further improvements as long as they are technically, functionally and economically feasible. If you think you may be affected see Approved Document L2B for further information, at: www.planningportal.gov.uk.

The **Enhanced Capital Allowance** (ECA) scheme encourages businesses to invest in energy-saving plant or machinery. The ECA scheme provides certain businesses with 100% first year tax relief on their qualifying capital expenditure. To qualify the equipment must be specified on the Energy Technology List (ETL) which is managed by the Carbon Trust on behalf of Government. The scheme allows businesses to write off the whole cost of the equipment against taxable profits in the year of purchase. For further information visit: www.eca.gov.uk/etl

Interest Free Energy-Efficiency Loans

Energy-Efficiency Loans of between £5,000 and £100,000 are available to qualifying small and medium sized enterprises (SMEs) In England* and Scotland* and any sized business in Wales*, looking to invest capital in energy saving projects. All businesses based in Northern Ireland* may now be eligible to apply for an interest free loan of up to £400,000. The loans are repaid over a period of up to 4 years and businesses must have been trading for at least 12 months.

To find out more please call 0800 085 2005 or visit www.carbontrust.co.uk/loans



For further information about air conditioning systems

AUDITAC

The EU funded project for Field benchmarking and Market Development for Audit Methods in Air Conditioning which includes a Customer Advising tool.
www.eva.ac.at/projekte/auditac.htm

Heating and Ventilating Contractors Association

This organisation works on behalf of firms active in the design, installation, and maintenance of heating and ventilating products and equipment.
www.hvca.org.uk

Chartered Institution of Building Services Engineers (CIBSE)

The professional body for building services including heating, ventilation and air conditioning
www.cibse.org

British Property Federation (BPF)

This organisation represents the interests of all those involved in commercial property ownership and investment.
www.bpf.org.uk

British Institute of Facilities Management (BIFM)

This is a UK Institution for facilities managers and those who work in organisations supplying FM related goods or services.
www.bifm.org.uk

Federation of Environmental Trade Associations (FETA)

This is a UK body representing the interests of manufacturers, suppliers, installers and contractors within the heating, ventilating, refrigeration & air conditioning industry.

The Carbon Trust

This trust helps businesses and public-sector organisations to cut their energy costs and combat climate change
Advice Line: 0800 085 2005
www.carbontrust.co.uk/energy

*Subject to terms and conditions and eligibility

A welsh translation is available on request by calling 0870 1226 236.

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