



tenant's energy review



THE FIVE STEPS

to improve energy efficiency and reduce CO₂ emissions in rented office buildings

A guide for landlords and managing agents



Want to reduce your buildings' carbon emissions and save money?

There is widespread scientific agreement that greenhouse gas emissions from human activity are affecting the climate, especially carbon dioxide from fossil fuel burning.

There is also growing concern that a relatively small temperature rise may trigger rapid and destructive climate change, as natural systems respond and release more greenhouse gases.

Government policies, nationally and internationally, are focusing on how to reduce carbon dioxide emissions. Companies and investors are also stepping up their responses.

Fuel and electricity consumption in buildings are a major part of the problem, and of the solution. They account for 40% of the European Union's carbon dioxide emissions from fossil fuel burning. The proportion is higher in the UK - 47% in total, with 27% for residential buildings and 20% for other buildings.

The British Property Federation (BPF) is committed to improving the sustainability and energy efficiency of commercial buildings at all stages in their life cycles. The actions our members are taking are already affecting how properties are built, refurbished and redeveloped, but as this affects only a small percentage of the total property stock, it will take some time to affect CO₂ emissions.

However, we can make more immediate reductions by ensuring all the buildings we own operate as effectively as they can.

This guide shows you how to do it...

The five step process

With funding from the Carbon Trust and technical assistance from the Usable Buildings Trust, the BPF has developed a five step process to help landlords and managing agents improve the energy performance of their office buildings, starting with the landlord's services and then involving tenants.

STEP 1 Take stock

- STEP 2 Start planning
- **STEP 3** Make initial savings
- **STEP 4** Work with tenants
- STEP 5 Make improvement routine

We have trialled these steps on real buildings owned by BPF member companies. The experience suggests that annual reductions of 10% - sometimes as much as 30% - can be made to the energy used on landlord's services (things like heating, ventilation and lifts).

These savings were sometimes made at relatively low cost, and the process also helped to identify further improvements that could be made as investment opportunities arise.

STEP 1: Take stock

ARE YOU IN CONTROL?

Landords and managing agents can often improve their management processes and substantially reduce the energy used by landlord's services, before they even begin to involve their tenants. An example of the sorts of savings that can be made is given in case study 1 on page 7.

Do you know how much energy you are using?

- Can you get hold of energy reports for each of your buildings?
- How well can you distinguish between energy for landlord's services and direct tenant usage?
- How accurately can you apportion energy use for landlord's services to individual tenants?

Do you have procedures for managing energy and carbon dioxide emissions? Are they working?

- Do you have an energy or carbon management policy and does it include improvement targets?
- Who is actually responsible for identifying and progressing energy improvements in each building?
- Do they have any resources, incentives, and expertise for doing this?
- Do they need help?

Is it clear what you are managing?

- What are the contracted hours for the services you provide to tenants? What are the actual plant schedules?
- Are the hours reasonable in relation to the use of the building, or should they be questioned?
- What conditions (eg temperatures) are you contracted to deliver and are they being achieved?
- Do you have to leave the plant running for extended hours to maintain these conditions? If so, why?
- Are you sure it is off when it says it is?
- Are the services adequately zoned, to match plant operation to tenant requirements?

Are the landlord's services efficient?

- Confirm the net lettable area of each tenancy and the gross floor area of the building.
- Check how your building (and your stock) compares with benchmarks per unit floor area.
- Do any special circumstances (eg extended use) need to be taken into account?
- If the comparison is poor, do you understand why, and what you might do to improve the situation?

STEP 2: Start planning

MAKE SURE SOMEBODY IS RESPONSIBLE FOR MANAGING ENERGY IN EACH BUILDING

They should:

- Set up a routine for monitoring and understanding energy performance at least annually, preferably monthly
- Communicate performance to everyone (eg landlord's staff, managing agents, tenants, cleaners and security)
- Generate enthusiam and collect ideas
- Establish and maintain an energy improvement plan
- Take action and review progress.

Different roles may suit different people:

- Collecting energy data from meters, etc. building manager, security
- Analysing data building manger, energy manager, administrator
- Communicating results, promoting actions and generating enthusiasm carbon champions (see case study 2 on page 8).

IDENTIFY SCOPE FOR INITIAL IMPROVEMENTS

- Seek ideas from your staff and service providers cleaners, security, maintenance, etc.
- Highlight areas of avoidable waste, for example:
 - wasteful lighting, eg circulation lights on when sunny or overnight, inefficient tungsten lighting
 - not switching lights and equipment off when they are not needed
 - equipment (eg HVAC, lighting and office machinery) running unnecessarily
 - lack of zoning, control or comfort problems requiring a lot of space to be conditioned when few people are using it.
- Review opportunities for low cost improvements.
- Review maintenance and management agreements (eg to maintain contracted time and temperature settings).
- Establish strategic maintenance opportunities (eg reorganising heating zones when you replace key services).

DRAFT A LONG TERM ENERGY PLAN

• This should include a wish list for higher cost improvements, or changes to contracts at the next review.

STEP 3: Make initial savings

YOU SHOULD NOW HAVE A LIST OF THINGS TO GET ON WITH

For example:

- Changing hours of operation, temperature settings, labelling of switches, security and cleaning routines.
- Making simple repairs (eg missing insulation and draught stripping), and replacing outdated and damaged items.
- Simple technical upgrades, eg low energy lamps, better control devices, tackling cold spots.
- Adjusting, re-commissioning or otherwise improving controls and zoning of heating, air conditioning and lighting.
- Creating interest and involving staff in making savings (eg carbon champion activities see case study 2 on page 8).
- Reviewing purchasing policies for outsourced services and supplies to take more account of energy and CO₂.
- Involving support staff (security, cleaning, maintenance) in avoiding waste and providing help, feedback and ideas.

Case study 1: a managing agent improves electricity demand profiles

A portfolio benchmarking exercise identified a modern office which had a high annual electricity consumption per m^2 . Its half hourly electrical demand profiles (left graph below) revealed high night and weekend loads in relation to the weekday peaks. The managing agent thought that it might be able to reduce these without affecting service levels during the contracted hours of occupation. A new regime started in October 2006: this halved the night loads and reduced monthly electrical consumption by 25-30% without inconveniencing the tenants. These measures will produce annual savings of £25,000, or 250 tonnes of CO_2 .





The graph on the left shows the half hourly profiles of electricity demand in kilowatts (kW) for each day of the week in September 2006, before the changes were made. The graph on the right shows the same thing afterwards, in November 2006. Demand at night and weekends was reduced from 175 kW to 75 kW by switching off plant and lighting that had been running unnecessarily.

If you have half hourly metering, you should be able to get profile information like this from your electricity supplier.

STEP 4: Work with tenants

DISCUSS THE CURRENT SITUATION

- Explain what you, as landlord, have already done, and what else is planned.
- Discuss what your tenants think about it and see what else they suggest.
- Review how your annual performance and demand profiles compare with benchmarks.
- Consider tenants' actual service requirements, eg temperatures and hours of operation.

The BPF has developed a Landlord's Energy Statement (LES for short) to help you report the energy performance and CO₂ emissions of your landlord's services to each tenant. You can find out more about this on page 10 of this booklet.

ENCOURAGE TENANTS TO UNDERSTAND AND IMPROVE THEIR OWN ENERGY USE

- Are tenants recording, analysing and managing their own energy use? What meters do they have?
- Could their staff be encouraged to switch things off more? What is the policy for service levels out of hours?
- Are there opportunities for savings (eg to HVAC, lighting, office and catering equipment, machine rooms)?
- Can routines for catering, cleaning, security and reception staff be changed to help save energy?
- Would a carbon champion be helpful (see case study 2 below), either for the tenant or for the building? They can build interest by enthusiasm; they might even produce newsletters and websites to float ideas and report improvements.

Case study 2: tenant carbon champions

Architects HLM signed up to CIBSE's 100 days of carbon clean up campaign in summer 2006. A carbon champion was appointed to oversee improvements in the company's five offices around the UK. A person was also made responsible in each office for taking forward the campaign and reporting to the champion. The office representatives were assisted by one of the administrative staff, to ensure that the agreed procedures were carried out day to day.

Discussion continued through the campaign, both informally (eg during breaks) and by submitting suggestions. In practice, over two thirds of the staff contacted the carbon champion directly. All the improvements undertaken were zero cost measures affecting staff and management behaviour, including switching off office equipment when not in use, changing set point temperatures, and maximising the use of daylight.

Progress varied between the offices, as did the availability of good energy data to quantify the precise effects on landlord's services and on the tenant's metered electricity use. Results were clearest in London (the champion's base), where the building's summertime electricity consumption fell by over 30%, and in Sheffield, with savings of 9% in HLM's tenanted area. The equivalent reductions in power station emissions were 22 and 12 kg of CO_2 per day.

STEP 5: Make improvement routine

IDENTIFY OPPORTUNITIES FOR JOINT ACTION

Once tenants understand their energy use and have taken some action, they will have ideas for further improvements. Some of these will need to be discussed with the landlord or managing agent, for example:

- changing plant operating schedules and temperature set points (small changes can make big differences)
- changing service zoning or providing local plant to make out of hours operation more economical
- changing the type and use of lighting in common parts or outdoors
- tackling any hot or cold spots locally, so that the main heating and air conditioning can be run more economically
- considering more radical changes to the building, its engineering systems and its energy supplies.

CONTINUE ROUTINE MONITORING AND FEEDBACK

To maintain the savings achieved, you need to monitor energy consumption routinely, to follow trends and identify problems when they occur. Landlords and tenants should set up a strategy to review the data. This should include:

Data collection, with readings collected at least monthly for all types of energy used:

- thermal: gas, LPG, oil, biomass, district heating, district cooling
- electrical: mains electricity, including half hourly demand profiles where available
- renewable energy and combined heat and power (CHP): amounts generated, fuel and CO₂ saved.

Review of outcomes, including:

- monthly checks on energy use, including electrical demand profiles and weatherrelated heating performance
- regular sharing of information and ideas, both informally and at meetings
- annual preparation of Landlord's Energy Statements more details on the next page
- annual reviews of trends, progress and improvements
- updates to the energy plan (see step 2 on page 6), including capital projects, operation and maintenance, and fuel supplies
- ongoing support for the carbon champion activities to maintain everybody's interest and awareness.

YOU MAY NEED TECHNICAL ASSISTANCE

Landlords, tenants and managing agents will often have their own advisers or can share experience with others on site.

You can also get help from the network of low carbon consultants, established in 2006 with support from the Carbon Trust, and managed by CIBSE - see www.lowcarbonconsultants.org. Other useful contacts are given on page 14.

LANDLORD'S ENERGY STATEMENTS

The EU Energy Performance of Buildings Directive requires buildings to have energy performance certificates, a requirement that will be phased in between 2007 and 2009.

There are two types of certificate:

- Energy Performance Certificates (EPCs), based on calculated energy use ('asset ratings')
- Display Energy Certificates (DECs) based on actual energy use ('operational ratings').

EPCs will be required for all buildings for sale or let, or for new buildings when completed. The BPF is encouraging all landlords to adopt the requirement as best practice for their buildings and to create and use Landlord's Energy Statements (LES).

DECs will be required for certain public buildings over 1,000m², but their use is likely to be extended to other private buildings, such as hotels and shopping centres. Some owners, managers and occupiers of private buildings may decide to produce operational ratings voluntarily.

To help landlords towards meeting their energy performance requirements, the BPF, with support from the Carbon Trust, has developed a Landlord's Energy Statement. This is an industry-standard output format that landlords and managing agents can use to report the landlord's annual energy use in their buildings. The LES can be given to prospective buyers or tenants, or to existing tenants to enable them to work out their total carbon emissions.

Importantly, the LES compares a building's energy efficiency and carbon dioxide emissions with those of comparable buildings, giving ratings that are appropriate for the type and use of the building.

It also highlights areas that could be improved and reports on the effect of past improvements.

PRODUCING LANDLORD'S ENERGY STATEMENTS

You can create LESs using the special Excel workbook produced as part of the BPF's LES-TER project. It is available to download, together with much more information, on www.les-ter.org.

Page 11 gives an example of a statement output by the LES workbook, showing the type of information it contains.



Landlord's Energy Statement example correct at the time of printing. For the latest version, go to www.les-ter.org

HOW THE LANDLORD'S ENERGY STATEMENT WORKS

The diagram below shows how a LES is calculated for a building with common parts (in yellow), office tenants (in blue), and two shop tenants (in orange):

- shop 1 connects to the common parts and uses some landlord's services
- shop 2 is a self-contained lock up that doesn't use the landlord's services.

The sources of purchased energy (eg gas, electricity, oil and solid fuel) and onsite renewable energy (eg solar, wind and water power, and site-grown biomass) are shown at the top left.

The LES:

- identifies the annual consumption of all purchased energy supplies (including biomass) by source
- adds the output of any on-site renewable generation
- deducts any energy that does not go to the landlord's services
- this gives the relevant totals, which can be reported as a building average for statistical purposes
- apportions the total to each tenant who shares the landlord's services and prepares their individual LES.

Energy supplied, metered and billed directly to tenants (to the right of the diagram) will be reported separately.



Reviewing patterns of fuel and electricity demand

Monthly heating fuel consumption patterns

Plotting monthly gas (or other thermal fuel) consumption against the requirement for heating (normally expressed in degree days, see www.vesma.com/ddd) will help to identify whether your plant is well controlled and if summertime consumption is high. This technique can be used for accurate setting and monitoring of heating performance targets. You may well need take your own monthly readings. If you use gas, bills are often estimated. If you use oil, LPG or solid fuel you will need to keep records of deliveries and make monthly checks of stocks, eg tank levels.

Half hourly electricity demand profiles

Most large buildings (with electrical demands over 100 kW) will already have half hourly electricity metering. You should be able to obtain the half hourly demand profiles from your supplier, often through a weblink or download; or your own BMS or sub-metering system may already collect data automatically. The profiles will help you visualise the current usage pattern for the building and identify unusual or wasteful practices (eg high base loads at nights and weekends, and plant left on unnecessarily, as in case study 1) and demonstrate the results of your improvements.

Case study 3: Land Securities, Regis House, London

Between October 2004 to October 2005, Land Securities' management undertook a year long campaign which included:

- collecting and analysing half hourly meter readings
- reviewing occupancy requirements with all tenants and ensuring systems did not run (on unoccupied floors) when floors were not occupied
- raising awareness of tenants and maintenance contractors
- providing switch off instructions to security and cleaning staff for lights left on after hours in unoccupied rooms
- checking weekly that after any extension to operating hours, controls had been reset to normal
- checking temperature set points and tweaking them to operate more efficiently
- ensuring that regular maintenance took place
- reviewing control logic and turning off unwanted plant in winter and summer
- taking meter readings monthly and reporting the improvements to those involved.

Annual CO_2 emissions fell by 29%, also saving £44,000. After allowing for weather and occupancy, the landlord's services used at least 21% less electricity and 8% less gas.

Case study 4: joining up ICT and facilities departments

Like many firms, Standard Life's facilities department often had to bear the consequences of the ICT department buying equipment that increased the company's electrical costs and air conditioning requirements. This was made worse by the ICT department asking users to leave their computers on overnight.

The two departments were merged and as a result, energy and servicing requirements are now considered when investment and operating decisions are made.

And staff now switch their computers off at night!

Further information and support

The **LES-TER** project was created by the BPF with technical assistance from the Usable Buildings Trust and funding from the Carbon Trust. It has initially concentrated its efforts on devising and trialling a Landlord's Energy Statement (LES) to allow landlords to report on the energy performance and carbon emissions of their buildings' landlord's services. The project is now turning its attention to creating a Tenant's Energy Review (TER), allowing tenants to build up a complete picture of the energy performance and carbon dioxide emissions of the space and buildings they occupy. More information is available at **www.les-ter.org**.

The **British Property Federation (BPF)** represents the interests of all those involved in property ownership and investment. It aims to create the conditions in which the commercial property industry can grow and thrive. It also provides a forum for sharing and agreeing sustainability policy guidance. More information on the BPF and its sustainability initiatives is available at www.bpf.org.uk.

The **Carbon Trust** provides a range of energy and carbon management resources, guidance and best practice documents, much of which can be downloaded from www.carbontrust.co.uk.

The register of **Low Carbon Consultants (LCCs)** is a database of construction professionals that have demonstrated skills and abilities in delivering and managing more energy efficient buildings. It is available at www.lowcarbonconsultants.org.uk.

The Usable Buildings Trust (UBT) is an independent UK charity that promotes better buildings through more effective use of feedback on how they actually work. More information is available at www.usablebuildings.co.uk.



Endorsed by





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