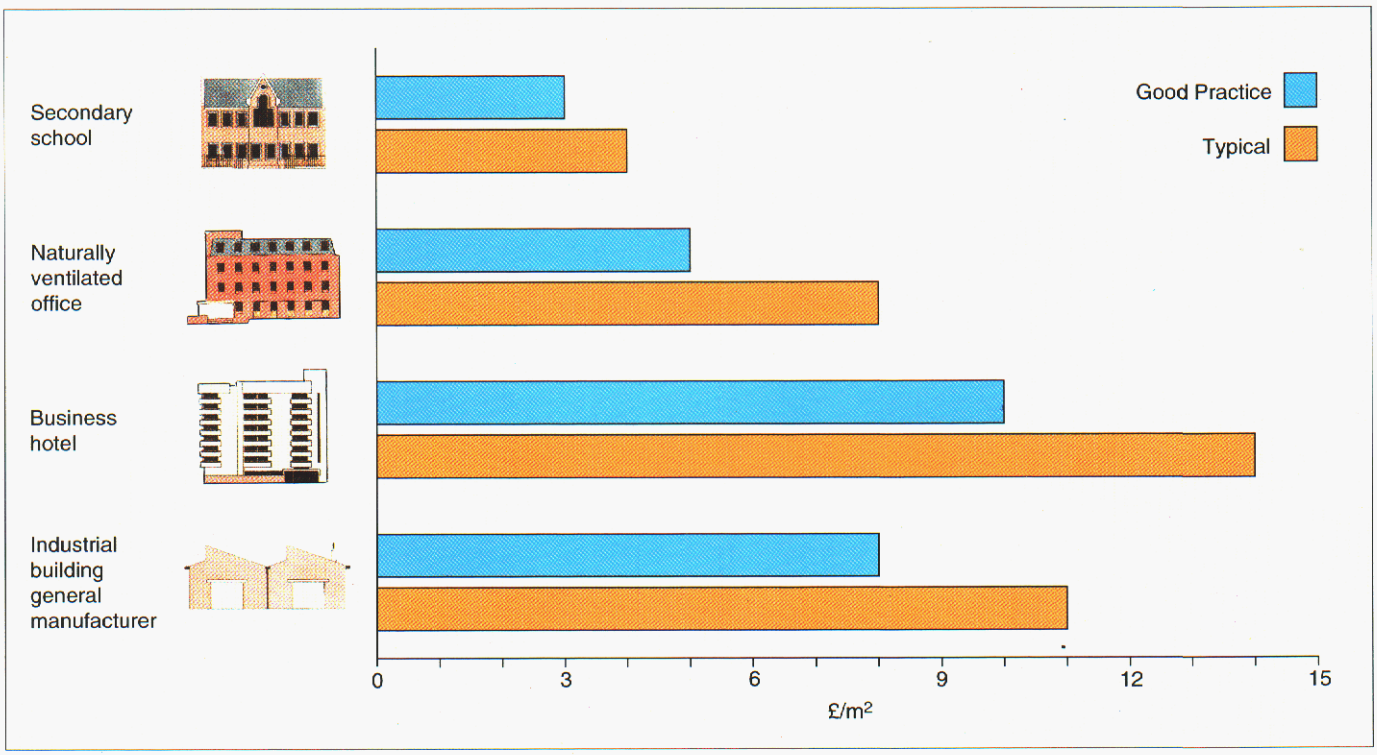
Guide 136

Is your energy use under control? – A practical guide to assessment and action



Annual energy consumption in £/m² (from Energy Efficiency Office Energy Consumption Guides)

This practically based Guide aims to help those who wish to gain control over their organisation's consumption of energy. It introduces a simple, non-technical, two stage process to help you manage energy better:

- an assessment of where you are now
- an action plan for making improvements.

The **assessment** will help you to evaluate the strengths and weaknesses of your organisation's control over energy consumption. It describes various levels of control against which you can prepare a visual profile of your achievements to date.

The **action plan** will help you to establish priorities for improving how energy is managed in your organisation.

The profiles and action plan can both be used to report to others in your organisation about your plans for improvement. Between them, these two simple processes form important first steps in reducing your energy costs.

The potential benefits to your organisation of gaining control over energy can be seen in the chart above. This shows the range of energy consumption for typical and good practice buildings taken from Energy Consumption Guides published by the Energy Efficiency Office (ECON 28, ECON 19, ECON 36 and ECON 18). These Guides show consistently that good practice buildings consume only about two-thirds of the energy of typical ones.

Good practice in the management of energy requires a balanced approach to both practical and management aspects. The Energy Efficiency Office has already published guidance on the Organisational Aspects of Energy Management (GIR 12 and GIR 13). These provide detailed guidance on reviewing management practices in the key organisational issues of policy, organising, motivation, information systems, marketing and investment.

This Guide supports a balanced management approach by considering the practical aspects of using energy efficiently. Completion of the two simple assessments and the action plan are the first practical steps to achieving good levels of energy efficiency in your organisation's buildings.

BEST PRACTICE PROGRAMME

Energy Efficiency
DEPARTMENT OF THE ENVIRONMENT

ASSESSMENT PROFILE OF OPERATING PRACTICES

Name of building:	Name and position of the assessor:	Date of the assessment:

Level	Auditing energy use	Housekeeping	Budgets	Contractual arrangements and purchasing policy
4	Regular and detailed financial and technical audits of all fuel consumptions are conducted. These are followed up by actions taken to resolve all queries or discrepancies.	Good housekeeping practices are documented room by room and operation by operation. Staff control their own use of energy. Practices are reviewed regularly and feedback is provided. All staff receive regular training.	Cost centres are established within which budgets for various fuels are set by reference to requirements. Comparisons between expenditure and budgets are formally reported.	Energy efficiency criteria are included in purchasing policy and contract documents. The criteria include formal evaluation of performance. Compliance with policies is checked regularly.
3	Fuel use is monitored on a monthly basis, and compared with formally established targets. Action is taken to investigate exceptional consumptions.	All staff receive induction or in-service training on the effect of their actions and operations on energy consumption. The effectiveness of training is reviewed periodically.	The costs of different fuels are identified and budgeted as a controllable cost, and regular reviews of expenditure against budget are conducted.	It is normal practice for purchasing and contractual policies to specify energy efficiency requirements in all contracts that impact on energy consumption. Formal evaluations are undertaken on building and maintenance contracts.
2	Regular checks are made between fuel invoices received and meter readings.	Training courses include specific reference to energy issues but there is no mechanism for reviewing their impact.	Energy costs are budgeted but, provided expenditure is within budget, they receive no further consideration.	It is normal practice to specify energy efficiency requirements in building and maintenance contracts. Formal evaluations are not undertaken.
1	Checking is limited to comparisons between fuel invoices and meter readings when fuel invoices are considered to be exceptional.	There is an ad-hoc approach to raising the staff's energy awareness but good practices are implemented only by a few committed individuals.	Budgeting for energy expenditure is established on a historical basis and is reviewed only when there are major divergences.	Energy efficiency requirements in contracts are not a purchasing policy requirement. Energy efficiency requirements may exist in a small number of contracts.
0	Bills are paid as and when received with little or no scrutiny.	No-one accepts responsibility for controlling their own consumption of energy and no corporate attempt is made to raise staff awareness of the need for energy efficiency.	Energy is not differentiated from other premises-related costs.	There is no reference to energy efficiency in any purchasing or contractual documentation.

Rank the columns in order of priority ☐ ☐ ☐ ☐

ASSESSMENT PROFILE OF DELIVERED PERFORMANCE LEVELS

Name of building:	Name and position of the assessor:	Date of the assessment:

Level	Maintenance of building services and fabric	Electrical equipment	Artificial lighting	Space heating and internal temperatures
4	Comprehensive planned maintenance of services in accordance with trade association standards. Equipment and servicing manuals are up to date. Conditions of doors, windows and insulation are reviewed. Annual report is prepared.	Equipment operates only when required and an established routine exists for switching off unnecessary items with a member of staff responsible for checking compliance.	Lights operate only when and to the extent required by occupation. Where daylight is available, light output is adjusted to the minimum required. There is an established routine for regular checking of artificial lighting usage.	Appropriate temperatures are maintained throughout the building. Hours of operation are closely controlled. Regular checks of temperatures and hours of operation.
3	Reference is made to trade association standards. Maintenance is recorded in log book. Instructions and servicing manuals exist. Annual report identifies replacement priorities for equipment and upgrading of fabric .	Equipment operates only when required and there is a routine for switching off. But compliance checking is only occasional and informal.	Lighting levels and hours of operation are well controlled. Checks are undertaken periodically on an ad hoc basis. Cleaners light their current working area only.	Appropriate temperatures are mostly maintained. Hours of operation are controlled. Seasonal checks of temperatures and heating hours.
2	Maintenance of services includes two inspections per year in addition to breakdown cover. Testing of controls is included. Maintenance logbook and equipment manuals exist. Majority of problems are solved quickly.	Equipment is switched on when required and generally switched off at the end of the period of use. But it is occasionally on overnight and at weekends. There is no checking.	Light levels are partially controlled. Lights are switched on only when they are required, and switched off at the end of the occupation period. There is no routine for checking unnecessary lighting usage.	Temperatures are generally appropriate, but there are occasions in the heating season when some areas under- or over-heat. Hours of operation are partially controlled. Checking is minimal.
1	One routine inspection per year of services plus breakdown cover. A small number of doors and windows are draughty.	Equipment is often left on overnight and sometimes at weekends and holidays.	Lighting levels are partially controlled. Lights are switched on at the beginning of the day and operate continuously whenever the building is occupied, whether required or not.	Temperatures are regularly too warm or too cold in much of the building, which continues to be heated even when unoccupied. There is no checking of temperatures or heating times.
0	Maintenance is carried out only when services fail. No routine inspections of doors, windows or insulation are conducted.	Equipment is regularly left on 24 hours per day including over weekends and holidays.	Lighting levels are uncontrolled. Lighting is frequently left on 24 hours per day whether the building is occupied or not.	Temperatures are uneven and there is no control over the hours when the heating runs. No checking of temperatures or hours of operation.

Rank the columns in order of priority ☐ ☐ ☐ ☐

HOW TO USE THE ASSESSMENT PROFILE METHOD

Drawing assessment profiles

The assessment method used in this document is intended to help you to identify the strengths and weaknesses of your organisation's control over energy. And it will help you to set priorities to ensure you make the best use of your organisation's resources.

Effective control over energy needs actions on a number of different fronts, such as:

- monitoring energy consumption and setting targets
- motivating staff to conserve energy through good housekeeping measures
- identifying energy conservation opportunities.

These and other energy-related activities need to be developed in balance with one another if premises are to be managed effectively.

The two assessment profiles in the centre spread have been developed to help you to diagnose how well advanced your practices and achievements are. The column headings represent those aspects of premises management which are most crucial in their impact on energy consumption, while at the same time most readily observable.

Each column is divided into five levels. As your handling of energy becomes more mature you move upwards. Your aim should be to move your organisation up through these levels towards current 'best practice' and, as you do so, to develop balance across the columns.

How to establish a profile

The ascending rows from 0 to 4 represent increasing levels of achievement in managing your energy consumption. Use the matrix to assess where you are currently and to identify some of the measures you need to take to reach the higher levels.

Make a copy of the matrix and use it as follows.

1. Consider each column one at a time.
2. Obtain the evidence necessary to assess at which level your organisation's practices lie.
3. Assess the evidence and mark the level in each column which best describes where you are currently. Place your mark in the appropriate cell or between cells if you think this is more accurate.
4. Then join up your marks across the columns to produce a graph line or profile.

If you have several buildings prepare a profile for each one.

Operational practices: gathering evidence

Almost all premises-related decisions and actions taken by you and your colleagues have an impact on energy use. In order to assess your company's profile of operating practices you will need to consult other members of staff to obtain appropriate evidence. Look for the following.

- What are the objectives of the organisation as expressed, for example, in company policy?
- What is the level of staff awareness of energy expenditure and of the organisation's policy towards conserving fuel and power?
- Are policies implemented in day-to-day procedures?
- How is compliance checked?

Energy efficiency requires team work

Using this Guide will bring you into contact with many people in your organisation. Try to devise ways to encourage the co-operation and participation of staff. Make use of opportunities to seek their views – they may have valuable ideas to contribute. Involve them in your plans by incorporating their ideas. Keep them informed of proposals and what they, as well as the organisation, stand to gain from them. You may wish to express the potential benefits in environmental terms, such as reductions in carbon dioxide emissions. It is important to ensure that when you begin to achieve results, you keep staff informed of them.

Assessing performance levels at different times

To assess performance levels you will need to make inspections at various times.

Before the day begins

- Identify any equipment and lighting left on all night unnecessarily.
- Do internal temperatures reach the required levels before the period of occupation?

During the hours of occupation

- Compare internal temperatures with your requirements.
- Identify any lights which stay on even when daylight is available.

At the end of the day

- Identify any equipment and lighting left on unnecessarily.
- Do temperatures remain unnecessarily high?

At weekends and holidays

- Identify what equipment continues to run.
- Check whether any lighting is left on.
- Does the heating come on unnecessarily?

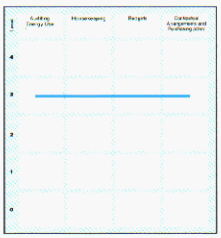
Seasonally

- Find out whether the heating is well controlled in spring and autumn.

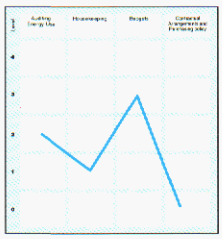
How to interpret the profiles

You can use the profiles you have drawn to assess how balanced your approach to energy efficiency is. Peaks indicate where your current effort is most well-developed, troughs where there is still scope for improvement.

The examples below show a balanced matrix and an unbalanced one.



balanced



unbalanced

Drawing the assessment profiles should give you a new awareness of how good your organisation's energy management practices are in these areas. Now you need to put this to work by identifying priority areas for action. For each of the profiles, rank the columns in order of priority in the boxes provided. You may wish to give priority to those that meet one or more of the following criteria:

- are least advanced
- are easiest to implement
- are cheapest to implement
- are most in line with your organisation's environmental policy
- offer the quickest return on investment
- have most impact on profitability
- offer the most visible impact.

The limits of non-technical observation

The column headings of the profile of delivered performance levels should give a reliable indication of how efficient your premises appear to be – given the limitations inherent in non-technical observations. Inevitably, however, there are some aspects of building performance that cannot easily be detected by non-technical observation, but which can have a significant impact on energy use. These include:

- the extent and thickness of wall and roof insulation
- the efficiency of the boiler plant and heating system
- the efficiency of the hot water storage and distribution system
- the operation of mechanical ventilation and/or air-conditioning
- the type of lamps installed in light fittings.

If you wish to go further than the assessment provided here, you will have to investigate the quality and impact of these items in your building. You may need to obtain technical assistance. Treat the outcome of the technical appraisal as supplementary to the results of completing the assessment profile.

ACTION PLAN

Name of building:	Name and position of the assessor:	Date of the assessment:

OPERATING PRACTICE		Timescale for introduction: Short 1 week	Medium 1 month	Long 6 months
AUDITING OF ENERGY USE	monitor fuel consumption regularly – at least monthly	☐	☐	☐
	compare consumption with requirements and norms	☐	☐	☐
	use spot check readings to assess out of hours use	☐	☐	☐
	introduce sub-metering of fuel supplies	☐	☐	☐
GOOD HOUSEKEEPING	raise staff awareness and improve staff attitudes	☐	☐	☐
	energy conservation included in training courses	☐	☐	☐
	increase staff motivation and use an incentive scheme	☐	☐	☐
	conduct publicity and promotional campaigns	☐	☐	☐
BUDGETS	cost-centre accounting for fuel expenditure	☐	☐	☐
	responsibility for payment delegated to budget holders	☐	☐	☐
	budgets set by reference to actual requirements	☐	☐	☐
	budgets and expenditure on energy formally reported	☐	☐	☐
CONTRACTS AND PURCHASING	check tariffs to ensure fuel purchased at minimum cost	☐	☐	☐
	efficiency criteria introduced into purchasing policies	☐	☐	☐
	use of specification by performance, with checking	☐	☐	☐
	contractors and suppliers are regularly monitored	☐	☐	☐

DELIVERED PERFORMANCE		Timescale for introduction: Short 1 week	Medium 1 month	Long 6 months
MAINTENANCE	ensure timers, programmers and controls set up correctly	☐	☐	☐
	ensure regular and planned maintenance of services	☐	☐	☐
	inspect condition of doors, windows and fabric	☐	☐	☐
	inspect insulation to fabric and hot water pipework	☐	☐	☐
ELECTRICAL EQUIPMENT	ensure equipment switched on only when required	☐	☐	☐
	identify responsibilities for switching off	☐	☐	☐
	install time clocks and programmers	☐	☐	☐
	make use of off-peak electricity wherever possible	☐	☐	☐
ARTIFICIAL LIGHTING	make maximum use of daylight	☐	☐	☐
	identify responsibilities for controlling lights	☐	☐	☐
	improve labelling of light switches	☐	☐	☐
	install low energy lights, and lighting controls	☐	☐	☐
SPACE HEATING	ensure heating operates only as and when required	☐	☐	☐
	ensure doors and windows kept closed when heating on	☐	☐	☐
	ensure radiators and heaters not obscured by furniture	☐	☐	☐
	ensure supplementary heaters not used	☐	☐	☐

USING PROFILES AND ACTION PLANS IN REPORTS

Setting priorities, achieving results

Once you have assessed your organisation's strengths and weaknesses, and selected your priorities, you need to define specific activities to help in improving your profile.

The action plan has been prepared to help you. Make a copy of it. Select some or all of the activities which correspond to the columns of the assessment profiles you selected as high priority. Tick the activities you propose to undertake to turn it into a schedule.

This can form the basis of your initial activities. Later you may wish to revisit it and use it to identify further actions. Avoid addressing too many areas simultaneously. It is better to set an achievable target and meet it. Once you have achieved success, publicise it to maintain the momentum.

Measuring success

It is best to decide on a clear measure which you can use to identify whether you have been successful. Achieving this will increase your own confidence about your ability to succeed in controlling energy better. You can also use this success to motivate others to help you.

Examples of ways by which you can measure success include:

- advancement up the assessment profiles
- achievement of energy savings
- raised awareness among members of staff and support from them for your activities
- the adoption of an energy policy by the organisation
- improvements in the information available about energy use
- more resources available for energy management.

Promoting your results

The completed assessment profiles and the action plan will provide you with a useful diagnosis. While you are making your assessments, defining what columns of the profiles to address as priorities and then identifying the specific actions you will take, you will need to liaise with other staff. With some you will need to build alliances, with others to gain their commitment.

The assessment profiles and the action plan can be used as part of the liaison process. For example, you may wish to circulate these items to staff to invite suggestions for improvements, or to incorporate them into reports to management. They could form part of your organisation's documentation of its environmental management activities.

SOURCES OF FURTHER INFORMATION AND ADVICE

FREE GOVERNMENT PUBLICATIONS

Best Practice programme publications available from BRECSU

General Information Reports

12 Organisational Aspects of Energy Management, 1993

13 Reviewing Energy Management, 1993

Energy Consumption Guides

18 Energy Efficiency in Industrial Buildings and Sites, 1993

19 Energy Efficiency in Offices. A technical Guide for Owners and Single Tenants, 1991

28 Saving Energy in Schools. A Guide on lighting and IT equipment for Heat Teachers, Governors and School Staff, 1993

35 Energy Efficiency in Offices. Small Power Loads, 1993

36 Energy Efficiency in Hotels. A Guide for Owners and Managers, 1993

Good Practice Guides

33 Understanding Energy Use in Your Office, 1992

74 Briefing the design team for energy efficiency in new buildings,1994

Best Practice programme publications available from ETSU

Good Practice Guides

84 Managing and Motivating Staff to Save Energy, 1993

85 Energy Management Training, 1993

Making a Corporate Commitment campaign

Information from the Energy Efficiency Office. Telephone 071 276 4613

- Chairman's check list
- Executive action plan

Other Energy Efficiency Office publications

- The IPS Energy Guide, Abba Consultants for the Institute of Purchasing and Supply and the EEO, 1991
- Practical Energy Saving Guide for Smaller Businesses, Energy Efficiency Office, 1992
- Introduction to Energy Efficiency, 1994. A series of booklets for the following sectors:
  - Catering Establishments
  - Entertainment Buildings
  - Factories and Warehouses
  - Further and Higher Education Buildings
  - Health Care Buildings
  - Hotels
  - Libraries, Museums, Galleries and Churches
  - Offices
  - Post Offices, Bank, Building Societies and Agencies
  - Prisons, Emergency Buildings and Courts
  - Schools
  - Shops
  - Sports and Recreation Centres

The EEO has also produced a series of 15-minute videos on 'Managing Energy', which cover a range of topics including heating, boilers, ventilation, insulation, metering, lighting, energy awareness and training.

Regional Energy Efficiency Officers (REEOs)

The REEOs provide a local point of contact and source of information and support.

Scotland	031 244 1200
Wales	0222 823126
Northern	091 201 3343
North West	061 838 5335
Yorkshire and Humberside	0532 836376
E Midlands	0602 352292
W Midlands	021 626 2222
Eastern	0234 276194
South West	0272 878665
South East	071 605 9160
N Ireland	0232 529900

Energy Management Assistance Scheme (EMAS)

EMAS provides help with the cost of consultancy to identify and manage energy efficiency projects, for businesses with fewer than 500 employees. For information and a booklet on 'Choosing an energy efficiency consultant' telephone the EEO on 071 276 3755.

OTHER PUBLICATIONS

Chartered Institution of Building Services Engineers

Delta House, 222 Balham High Road,
London SW12 9BS
Telephone 081 675 5211

AM5 Energy Audits and Surveys, 1991

AM6 Contract Energy Management, 1991

- Standard Maintenance Specification for Mechanical Services in Buildings, published by Heating and Ventilating Contractor's Association, 1990 (available from CIBSE)

British Standards Institution

BSI Sales, Linford Wood,
Milton Keynes MK14 6LE
Telephone 0908 221166

- ISO 9000, Quality systems
- BS 7750: 1992, Specification of environmental management systems

OTHER ORGANISATIONS

Energy Systems Trade Association (ESTA)

P O Box 16, Stroud
Gloucestershire GL5 5EB
Telephone 0453 886776

This is a trade association of suppliers of services and equipment for improving energy efficiency (including energy consultants, heating, ventilation and air-conditioning, boilers, lighting, control equipment, metering and monitoring, building energy management systems, contract energy management, combined heat and power systems, and heat recovery).

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For buildings-related projects: Enquiries Bureau, BRECSU, Building Research Establishment, Garston, Watford, WD2 7JR. Tel 01923 664258. Fax 01923 664787. E-mail brecsuenq@bre.co.uk

For industrial projects: Energy Efficiency Enquiries Bureau, ETSU, Harwell, Oxfordshire OX11 0RA. Tel 01235 436747. Telex 83135. Fax 01235 433066.
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