

Monitoring energy use through meter reading

Introduction

One of the most effective ways to manage and reduce your energy consumption in the workplace is to start recording and communicating your energy use on a regular basis. The advantages of taking regular meter readings include:

- 1) Identification of main sources of wastage e.g. if a large proportion of your consumption occurs out of hours, when predicted usage should be low, there could be easy ways to eliminate this waste
- 2) You can use meter readings to set measurable and achievable targets for reduction
- 3) Posting graphs of regular meter readings in visible places is an effective way to communicate with staff, reinforce messages about behaviour change and provide feedback for the effectiveness of campaigns.

What are the benefits of reducing consumption?

The following table shows the potential benefits in cost and carbon saving over a year for three types of workspace (all measuring 500m²) of reducing benchmark energy consumption from 'typical' to 'good'.

Type of building	Description	Typical practice kWh/m ² /yr	Good practice kWh/m ² /yr	Estimated yearly cost saving	Est. yearly carbon saving (tonnes of CO ₂)
Office	Naturally ventilated, open plan	85	54	£1178	8
Manufacturing	Light	70	31	£3800	26
Retail	Small food shop	500	400	£1482	10

This table shows that, even for relatively small offices, workshops and shops, there are significant cost and carbon savings to be made by increasing energy efficiency.

How to read your meters

Electricity, gas, and sometimes water, are all metered supplies – you pay for what you use. However, there are sometimes complications in determining your share of a metered supply.

Metering varies between building type, age and ownership. If you work in a small, self-contained building which your company owns or rents, there should be one or more meters that relate directly to your energy consumption. However, if you are one of many tenants in a multiple occupancy building, with a landlord, you might not have a separate meter for your section (you might pay a flat rate or a rate per m² of occupancy).

The information below relates to buildings where your consumption is metered directly. If your workspace is rented and not separately metered, you will need to discuss with your landlord how you could get more information about your actual consumption.

There are two main types of meter:

- 1) Electromechanical meters (older style dials)
- 2) Solid state meters, which display consumption and other information on LCD screens. Newer electronic meters can be read remotely and can be used to vary prices throughout the day.

Older meters (dials) are read from left to right and should produce a 5 digit number. Newer solid state meters will have a digital display.

How to record meter readings

Recommended frequency - to ensure you get data that is easy to use, it is best to take meter readings at the same time every week. Although you can take daily meter readings, and this will give you a better accuracy, it is often hard to maintain this as a routine. However, it is useful to do one or two weeks of more detailed meter readings to provide a baseline.

Monday morning or Friday evening are usually good times to read your meters. It might be useful to keep post-it notes and a pencil next to the meters so it is easy for the person reading them to note down the data.

Entering the data - the easiest way to produce tables and graphs of meter readings is to enter data into an excel spreadsheet. Below is an example of how you can set up an excel spreadsheet. Row 3 shows the formulas for making the calculations and the other rows show examples of data.

The formulas on this spreadsheet are designed so that if you enter data on, say a Tuesday, rather than a Monday, it will adjust the units used per week accordingly in Column E. However, you do need to try and make sure you record the data within 2-3 hours of a set time every week e.g. between 8 am and 11 am.

Sample excel spreadsheet for electricity meter readings

	A	B	C	D	E	F
1	Date	Time	Meter reading	Units used (kWh)	Units used per week (kWh/week)	CO ₂ emissions per week (kg CO ₂ /week)
2	02/06/08	09:00	272280			
3	09/06/08	09:15	272330	=C3-C2	=(D3/(A3-A2))*7	=E3*0.523.
4	16/06/2008	08:45	272390	60	60	31
5	23/06/2008	09:00	272420	30	30	16
6	01/07/2008	09:00	272500	80	70	37
7	07/07/2008	09:00	272550	50	58	31

Setting targets

You can use information from meter readings and energy audit to identify workspace specific targets that relate to your specific circumstances. These should be SMART targets that are Specific, Measurable, Achievable, Relevant and Time-based. For example:

Use your meter readings to find out minimum night time electricity use (you are likely to need to use some power for servers, alarms etc) by turning off all unnecessary equipment and taking meter readings last thing at night and first thing in the morning. Use this to set a SMART target as shown below.

Target	SMART objectives
Reduce out of hours electricity consumption to base load of 10 kWh/hour by end of September	Specific: it relates to a specific energy source and consumption time scale
	Measurable: through repeated meter readings
	Achievable: based on known minimum baseload
	Relevant: based on what can be done by staff in that workplace
	Time-based: sets a clear time frame for achieving the target

Benchmarking is also a useful exercise to determine how much energy you use in relation to others in your sector. There are a number of benchmarking tools available, including Office, Hospitality and Sports tools from the Carbon Trust and a list of simple energy consumption benchmarks from www.cooperatives-uk.coop

Communicating consumption with staff

Once you have a reasonable set of meter readings, you need to communicate these to staff. The best way to achieve this is through producing graphs of actual consumption on a weekly basis and making them available to staff through notice boards or the intranet. For example, the following graph can be put up on a weekly basis, along with a clear set of actions for staff.

These actions can be updated every couple of weeks to get staff to develop good energy habits that stick.

