FACT SHEET: Energy

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Monitoring energy consumption

Monitoring energy consumption will help you to understand your current energy use and the opportunities available for reducing this.

The first stage is to perform a walk round of your entire business site, which will allow you to assess your current energy usage. Prepare for this by making a checklist. Key questions to answer should include:

- What sort of machines/appliances are in each room?
  - How many are there?
  - How much energy does each draw?
- Are these machines always on?
  - How many hours a day are they used for?
  - Are they left on energy efficient standby modes when not in use?
  - Are they switched off when not in use?
- Are energy saving measures in place e.g. efficient light bulbs?

It may be appropriate to prepare different lists for different types of room (e.g. kitchen, office). The checkpoints listed can be tailored to suit your individual business (more ideas of what to look for can be found by reading the rest of this document).

Consider the main likely sources of energy consumption for your business type. Do you use a lot of refrigeration equipment? Patio heaters? Computers and printers? These main impacts should be given priority in your walk round, so that you understand how each is being used.

Use the initial findings from the walk round as a baseline for future improvement. Perform subsequent walk rounds every six months or so, focusing on priority areas, areas where action has been taken, or new problems that arise. Remember that patterns of energy use will differ throughout the day, and therefore it may be useful to conduct a series of walk rounds at different times, e.g.:

- When the cleaners are on duty
- At lunchtime
- At a busy time, when you would expect to use a lot of energy.
- Overnight. This can be measured by checking your meter at the end of the day and then the start of the next morning. The difference between values will be the energy used overnight. Check that this is what you expected.

It may be useful to install a Smart Meter, which can identify the energy consumption of different appliances within the building. This can help you to save energy by allowing you to determine exactly which aspects of your business are the most energy intensive.

- This approach may be more economical for multi-site and energy intensive SMEs. Single site SMEs may get over a five year payback on the investment, but the presence of the Smart Meter may be helpful in motivating staff to reduce energy consumption.
- A trial by the Carbon Trust run from 2003-06 on the use of Smart Meters in SMEs (available at: www.carbontrust.co.uk/Publications/pages/publicationdetail.aspx?id=CTC714&respos=0&q=ctc714&o=Rank&od=asc&pn=0&ps=10) demonstrated that Smart Meters helped SMEs to identify an average of 12% carbon savings and implement 5% carbon savings through reduced energy consumption. This translated into average annual savings of over £1,000 and 8.5 tCO2 per site.

Reducing consumption through timer controls

Timer controls should be correctly set to match building occupancy, so that e.g. heating and lighting systems are not on when staff are absent. Also, heating need not be on throughout the working day. For example, office heating may be switched off an hour before the end of the day without affecting comfort levels.

Install plug-in seven day timers on individual pieces of office equipment to reduce the likelihood of machines being left on out of hours.

Energy efficient lighting

Both the use of lights and type of light fittings can often be changed to improve environmental practice and save money.

- Switch off lights overnight. Carry out late night checks to test whether this is occurring. Assign responsibility for switching off lights to staff.
    - Additional desk lighting should also be switched off by the staff who use them.
- Make the best use of natural light.
    - Situate desks near windows.
    - If there is sufficient daylight, switch off office lighting. This is easy to forget, especially during winter when staff arrive in the dark and lights are switched on first thing.
    - If glare from windows is a problem, instead of closing the blinds and turning on the lights, get angled blinds that will direct sunlight to the ceiling, producing a bright, diffuse light in the office without causing glare.
- Keep glazing and light fittings clean to maximise light output and energy efficiency. Consider replacing old yellow fittings with reflector (mirrored) fittings.
- External lighting should only be on when it is dark. If lighting is used as a security measure out of hours, consider using movement sensors to control how long the lights are on for.
- Install energy saving lightbulbs, which use between a fifth and a quarter of the power of regular lightbubs. These can last up to 12 times longer than ordinary lightbulbs, and may save you £60 in energy savings over the lifetime of the bulb.
    - Energy saving light bulbs are widely available for purchase, and you can also pick up some for free from Go Green Richmond upon Thames at many of the business specific events.

Heating

Heating can be a major source of energy consumption for your company, so monitoring and improving the efficiency of your system can make a significant contribution toward reducing your costs.

Controls

- Understand the time controls of your heating system and set them up to operate only when the building is occupied.
- Try to shut the heating off and hour before the end of the working day. The building will remain at a comfortable temperature without the heating always on.

- Keep your thermostat at 19°C (as long as this is comfortable for employees and customers), as heating costs increase by 8% for every extra degree of temperature.
    - Encourage employees to wear warmer clothing if some find it cool.
- Set the temperature of storerooms or corridors lower than the main office rooms. They don't need to be kept as warm as areas in which people spend long periods of time.
- Ask staff to report hot or cold spots in the building. Determine the effect of turning up the temperature to warm a cool area – do the hot areas become uncomfortable? If this is the case your heating system may need to be balanced, or require additional controls. Heating technicians can provide further advice on this.
- Keep the thermostat away from draughts or hot and cold spots, as these will affect your thermostat and cause it to overheat/cool your office, increasing your costs.

Equipment

- Leave space around radiators. Putting furniture in front of them will require more energy to heat the room.
- Don't put hot equipment, like photocopiers, near cooling vents. The cooling system will need to work harder to cool an area that is constantly being heated.
- Maintain your equipment properly to keep equipment working efficiently. This could save you as much as 10% of your heating bill.
- Switch off ventilation fans in unoccupied areas.

Windows and Insulation

- In warm weather, turn off heating before opening windows.
- Keep doors and windows closed in cold weather.
- Draught-proof your windows, doors and skirting and check the proofing regularly.
- Repair cracks in windows, walls or doors immediately to reduce heat loss.
- Replace damaged or damp insulation. Where applicable, fit insulation in accessible roof spaces and insulate pipes (especially hot pipes).

Use of computers and generic equipment

- Switching computers off when not in use (e.g. overnight and at weekends) can reduce energy consumption by 75% per year.
    - If the monitor is turned off when not being used (including lunch times and during meetings) and the standby options are activated, energy consumption can be reduced by 90% per year. Encourage staff to use these measures when stepping away from their desks for longer periods of time.
    - Activate energy saving standby modes.
- Switching off laser printers and photocopiers at evenings and weekends can reduce energy consumption by 75%.
- Cold drink vending machines, water coolers and coffee machines can be turned off overnight.
- Make grills and fans are not blocked and are regularly cleaned.

Renewable energy sources

Companies can access renewable energy either by buying it from their existing supplier (many of whom now offer renewable electricity contracts), or by generating their own energy on site. This is known as renewable energy 'microgeneration', using technologies such as:

- Photovoltaics (PV), also known as 'Solar' or 'Solar electric'
- Solar thermal (for heating water)
- Wind Turbines
- Heat Pumps (including Ground Source Heat Pumps)
- Biomass boilers
- Wood-fuelled stoves
- Small Scale Hydroelectricity

Green Book Live (www.greenbooklive.com/page.jsp?id=4) runs the website for the Microgeneration Certification Scheme (owned by the Department for Business, Enterprise and Regulatory Reform). Their website lists the all registered renewable energy microgeneration installers.

It is important to note that most microgeneration installations do not require planning permission from the council. Visit the website for more information: (http://www.richmond.gov.uk/home/environment/planning.htm).

It is possible to obtain grants or loans to install these energy technologies. Please refer to the Energy Grants Fact Sheet on the Go Green Business (www.richmond.gov.uk/gogreen/gg_work.htm) page for details of the variety of funding sources available for local businesses.

Of these funding sources, the Enhanced Capital Allowances scheme lists 14 renewable energy technology categories on the Technology Product List (www.eca.gov.uk/etl) which are all eligible for first year tax relief. These technologies are summarised below. More information on each is available via the links provided.

Air to Air energy recovery (www.eca.gov.uk/etl/find/_60.htm/) acts to transfer energy from exhaust air to supply air. This reduces the amount of energy required to heat supply air.

Automatic monitoring and targeting (AMT) equipment (www.eca.gov.uk/etl/find/_58.htm) monitors how much energy a site is using, allowing you to identify areas where it is being wasted and target these for energy-saving activities.

Boiler equipment (www.eca.gov.uk/etl/find/_6.htm) is often energy intensive, but by switching to a more efficient technology you can make large energy savings.

Combined heat and power (CHP) (www.eca.gov.uk/etl/find/_84.htm) generates heat and electricity simultaneously at high efficiency (60-80%, as opposed to conventional 30-50% generation efficiency). Typically CHP installations are used where there is a large-demand for heat, and have been installed in community heating systems, swimming pools and industrial applications. They are built to match site-specific requirements, where they are installed as the main boiler and electricity supply. They have been shown to generate savings of thousands of pounds each year in appropriate settings.

Compressed air equipment (www.eca.gov.uk/etl/find/_55.htm) can be used as an alternative to a direct energy supply, and are typically found on industrial premises.

Compact heat exchangers (www.eca.gov.uk/etl/find/_85.htm) are smaller than conventional heat exchangers and work efficiently to heat the same area much faster than a conventional exchanger.

Heating, Ventilation & Air Conditioning (HVAC) Zone Controls (www.eca.gov.uk/etl/find/_54.htm) will allow users to match the operation of heating and cooling in different areas of the building to the actual demand.

Heat pumps (www.eca.gov.uk/etl/find/_3.htm) act to transfer heat from external sources (air, water or ground) to internal spaces. They can also be used in reverse to pump heat outside, thus providing cooling. They are highly efficient, and can be especially useful in areas where only low levels of heat are needed, for example in underfloor systems.

Lighting (www.eca.gov.uk/etl/find/_2.htm) technologies such as controls, fittings etc are available for funding. This link will provide a list of manufacturers whose products are listed as 'high efficiency', and who will be able to advise you on appropriate technologies. Be sure to ask for the high efficiency products, and state that you wish to make a claim under the ECA for all purchases for appropriate advice.

Motors & drives (www.eca.gov.uk/etl/find/_17.htm) will save a lot of energy if they are more efficient than previous models. They also tend to have a longer useful life, and as a result will lower the ongoing maintenance costs.

Pipework insulation (www.eca.gov.uk/etl/find/_87.htm) prevents energy losses that occur during transfers through a heating or cooling system. Effective insulation improve efficiency by up to 20%. A wide variety of products is available for this technology, and so the Product List provides details manufacturers who can advise your company on what equipment would be most suitable for your needs.

Refrigeration equipment (www.eca.gov.uk/etl/find/_14.htm) can be a high energy cost, therefore efficient equipment and suitable insulation can contribute to large energy savings.

Solar Thermal Systems (www.eca.gov.uk/etl/find/_91.htm) use the sun's energy to heat water, avoiding the high cost of heating with a traditional boiler system. While solar thermal can provide sufficient hot water for smaller systems, large, industrial scale applications may require additional 'top up' heating to get water to the desired temperature.

Warm air and radiant heaters (www.eca.gov.uk/etl/find/_59.htm) are more efficient than boiler based systems, and especially suitable for larger building spaces. If used correctly, they can replace traditional hot water systems.

Awareness

Posters and stickers are a simple yet effective means of raising awareness of energy efficiency among staff.

- You can pick up free energy efficiency posters from Go Green Richmond upon Thames at many of the business specific events.

- Employee energy saving awareness posters and stickers are available to download from the Carbon Trust website: www.carbontrust.co.uk/energy/startsaving/staffawarenessposters.htm