If the catering industry does not start to make changes in its energy efficiency and CO_2 discharge levels, says *David Clarke*, it runs the risk that decisions will be made by those who don't understand the operational requirements and constraints of the industry

Design for efficiency

Current estimates indicate that the hospitality industry is one of the largest energy consumers in the commercial marketplace, using about £800m-worth per year, which equates to 3-6% of caterers' operating costs. With profit margins often in the same range, caterers have a lot to gain from energy efficiency.

Anything that increases energy efficiency and productivity has a positive effect on profitability. Savings of 10-40% have been reported when an energy strategy plan has been prepared and implemented, with increases in profitability being as much as one-third. Savings of this magnitude will also provide significant environmental benefits by reducing emissions of carbon dioxide (CO_2) and other harmful gases.

To achieve these savings a major change is required in the manufacture and procurement of plant and equipment. At present the main objective for a catering equipment or specialist manufacturer is to achieve a low purchase price for the appliance, with less importance being placed on its energy efficiency, hence the difference between the domestic market and the commercial market. A 35kW domestic boiler has to achieve an efficiency of not less than 86%, while a catering appliance of a similar size has to achieve only 50%.

However, manufacturers are starting to address the problem and redesign some of the more popular pieces of equipment. To encourage this to continue and gather speed, caterers need to develop and change their procurement strategy by taking the decision away from individuals with limited objectives (price alone) and turning it into a team decision involving a buyer, an operator, a maintenance engineer and a catering consultant who can advise on all aspects, allowing the purchase decision to be made using the whole life-cycle cost.

The whole life-cycle cost of an appliance, including purchase, maintenance, fuel and disposal, is likely to be five to 10 times higher than the purchase cost. To enjoy the benefits, the caterer has to consider all aspects when purchasing an appliance, thus giving the manufacturer a reason to develop energy efficiency. In return, the manufacturer has to operate an "open book" policy regarding energy efficiency and the likely maintenance costs throughout the life of the appliance.

ENERGY CONSUMPTION

The breakdown of electricity and gas consumption for a typical catering facility, including customer dining and bar areas, is:

● Food preparation, production and service	35%
● Heating, ventilating and air conditioning	28%
● Public health services	18%
● Lighting	13%
● Refrigerated storage	6%

Top: In the kitchen at Conran's Plateau restaurant in Canary Wharf, London, meat and fish are cooked on planchas, eliminating the need for pans and thus cutting down on energy loss through the transfer of heat

Right: The suite in the main kitchen at London's Lanesborough hotel uses induction hobs, which generate very little ambient heat and, therefore, reduce the requirement for air conditioning

SPECIALISTS

Many energy-efficient measures can be implemented without providing a new facility or refurbishing an existing one.

However, a senior member of the management team needs to "take ownership" of energy efficiency and have the necessary authority to bring in any specialists needed to complete the team, so that all aspects can be considered before drawing up and implementing the energy strategy. It should also be remembered that the disposal of waste requires energy, and the costs of this will only increase in the light of the latest landfill legislation.

For those wishing to run an energy-efficient, environmentally friendly building, Building Research Establishment's Environmental Assessment Method (BREEAM) could be the answer. It has for more than a decade been used to assess the environmental performance of both new and existing facilities. It is regarded throughout the UK as the measure of best practice in environmental design and management. Catering buildings can be assessed using a bespoke version of BREEAM, which will consider the performance of the building within the following areas: management, energy use, health, pollution, land use, ecology, materials used in construction, and water consumption.

As with all aspects of life, there are ups and downs, and energy efficiency is no different, Bear in mind that energy-efficient cooking appliances used in catering facilities today reduce fuel consumption and improve cooking times by maintaining a more consistent temperature. This results in the cooking oils and metal surfaces keeping hotter for longer and makes any attempt at fire extinguishing more difficult.

Therefore, specialist advice should be obtained, not only to help with saving energy but also to advise on any related areas, such as the design of a fire-suppression system.

David Clarke is a director of design consultants CDIS-KARM (01603 721961), a member of the Foodservice Consultants Society International UK (01483 761122, www.fcsi.org.uk)

ENERGY EFFICIENCY CHECK LIST

To provide an environmentally sound energy-efficient facility, the following need to be considered:

- Confirm that the electricity and gas procured from suppliers is being offered at a tariff that best suits the requirements of the business.
- Check that the proposed energy budget is in line with the business plan.
- Check that the structure and fit-out of the premises allows for the most efficient use of energy, through such means as reducing the ceiling heights in cellars and chilled preparation areas by installing insulated suspended ceilings to reduce the refrigeration load.
- Investigate and provide life-cycle costs for all finishes, equipment and plant, making sure that the life-cycle period matches the business plan.
- Look at the provision of split metering arrangements, based on the categories in the "Energy consumption" panel opposite, to allow the use of benchmark performance data to develop and maintain an energy strategy.
- Investigate the type, location and maintenance of all refrigeration plant used to provide food storage.
- Investigate the method and type of lighting being used and the lamp replacement policy.
- Check on the operational policy and methods of production and service to confirm that best working practices are being employed and that the correct appliance is being used to prepare and serve the various meals.
- To conserve water, all units should be specified with ½in British Standard Pipe thread taps, rather than ¾in, and provide spray heads fitted with a trigger gun on all wash-down hoses.
- Assess the water requirements of each appliance and use cold water whenever possible.
- Use heat pumps on larger dishwashers, as this will reduce the connected load by up to 20% while showing savings of 40-50% on the energy consumed. On smaller machines, where heat pumps are not financially viable, consider integral drain heat-recovery units, as this will reduce the connected load by up to 40%.
- Design the kitchen ventilation system using the thermal coefficient figure for each individual appliance to minimise the amount of extract and make-up air required.
- Ensure that space heating and cooling plant does not operate at the same time, and use programmable thermostats with out-of-hours set-back. The recommended settings for occupied heating and cooling are 20°C and 24°C; for unoccupied heating and cooling the settings are 10°C and 32°C.
- Analyse the energy source used to power each appliance. Gas is more environmentally friendly, and in some cases cheaper, than electricity. However, the appliance efficiency needs to be considered, as some electric appliances can be up to 55% more efficient than gas.
- Check that each appliance has been assessed to make sure that the highest output is achieved per square metre of floor space within the cost and energy budget.
- Ensure that the correct mix of equipment has been provided to produce the food in the necessary quantities considering the various peak and troughs.
- Whenever possible ensure that the equipment selected is enclosed and insulated so that energy stays within the cooking vessel and is absorbed by the food.
- Make sure that staff observe the basic principles of energy conservation: keep it clean; turn it down or shut it off.

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