

KITCHEN TRICKS

Using more energy-efficient equipment and adopting environment-friendly practices in the kitchen can reduce your business's carbon footprint and save money. Consultant *David Clarke* suggests some steps to take

Sustainability and energy efficiency have been on the agenda for some time, but a large number of businesses have paid them only lip service in the past. Now things are changing, with 61% of the hospitality industry responding to pressure from consumers and the Government to take environmental issues seriously. Those that accepted the challenge have been pleasantly surprised, for not only have they increased their social and environmental kudos, but they've also seen a very healthy increase in their economic bottom line.

By following the work-flow of a commercial kitchen it's possible to identify the areas where a food operation can achieve financial savings together with the maximum reduction in harmful emissions. Although not definitive, the following list contains suggestions that should be considered at the design stage and when carrying out energy and sustainability audits.

GOODS INWARD

- Doors can cause substantial heat loss, so ensure that external doors have automatic closures, and in areas of high usage consider fitting a draught lobby or porch.
- Consider fitting plastic strip curtains as they reduce heat loss and create a visual security barrier while still allowing easy access.
- Ensure easy fast access to the storage areas as this will keep deliveries at the correct temperature, thus reducing the workload on the refrigeration plant.
- Improved air movement from natural ventilation can significantly lower temperatures and improve general conditions in these areas.

STORAGE

- Refrigerated storage should be located in unheated areas which are well-ventilated and don't attract a lot of solar gain from windows and roofs.
- Ensure that refrigerated cabinets are the correct distance from the walls and ceilings to provide the necessary airflow around the units.
- Ensure that coldroom and appliance doors are closed when they're not being used, and fit strip curtains to coldrooms to reduce air transfer when stock is being loaded and unloaded.

- Stack food in such a way that it makes maximum use of the chilled space available without enclosing the evaporators, as this will cause the plant to work harder.
- When stock is low, transfer the contents to other units and switch the empty cabinets or rooms off.
- When buying refrigeration, consider units that use the environmentally friendly hydro-carbon refrigerants that consume less energy to bring temperatures down, and on larger systems consider secondary refrigeration that allows recovery of the rejected heat, thus removing the heat from the kitchen areas.
- Position ambient storage areas so that a temperature of 14-16°C can be achieved by

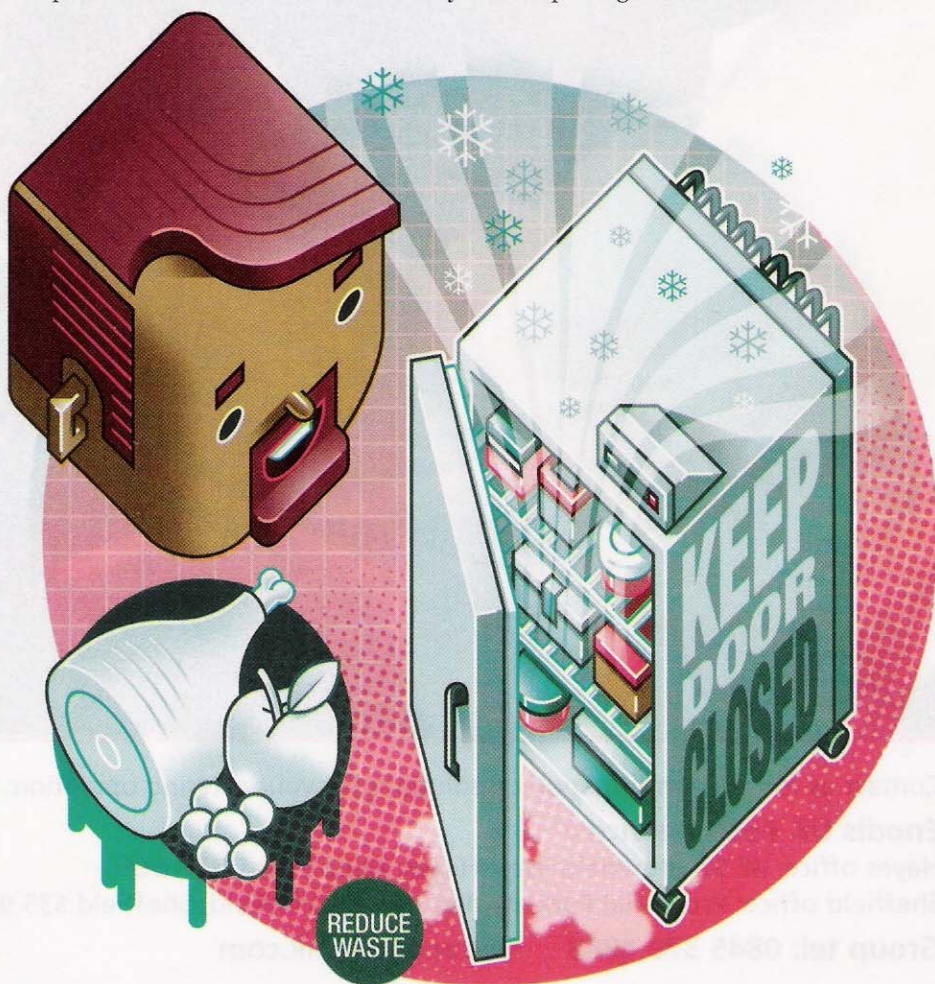
natural ventilation with the minimum of support from the mechanical cooling systems.

PREPARATION

- Provide cold-water spray attachments with hand-held triggers over preparation sink bowls to discourage staff from using running water.
- When the operation permits, use sensor taps to avoid water wastage, and if the hot supply is not required, don't install it. This could provide major savings on energy and water costs.

COOKING

- Keep refrigeration to the minimum level



"Train staff not to switch on equipment until it's needed and switch it off immediately after use"

that the chefs can safely operate with and consider using drawers instead of doors so that smaller areas are exposed to the warm air when being used.

- Consider using UV-C ventilation systems which allow the use of economical heat-recovery systems while cleaning up the discharge air.

- Remember that in the UK 1kW of heat generated by natural gas will discharge less than 50% of the harmful emissions that electricity produced by the national grid will.

- Keeping equipment clean can have a major impact on its efficiency. As a minimum, equipment should be cleaned after every service.

- Simmer or steam vegetables rather than rapidly boiling them as they won't cook any quicker but will use additional energy while heating up the kitchen. Consider using induction for small quantities and enclosed steaming/combination ovens for larger quantities instead of conventional open tops and solid-top boiling tables.

- Install two smaller appliances rather than one large one to give greater flexibility during quiet periods so that the energy used per meal is maintained at its lower level.

- Buy equipment with low energy consumption while on stand-by or idle mode.

- Consider appliances which use pre-mix burner technology and smart controls that can detect when appliances are not being used.

- Avoid opening oven doors by using the viewing panel to inspect food when possible.

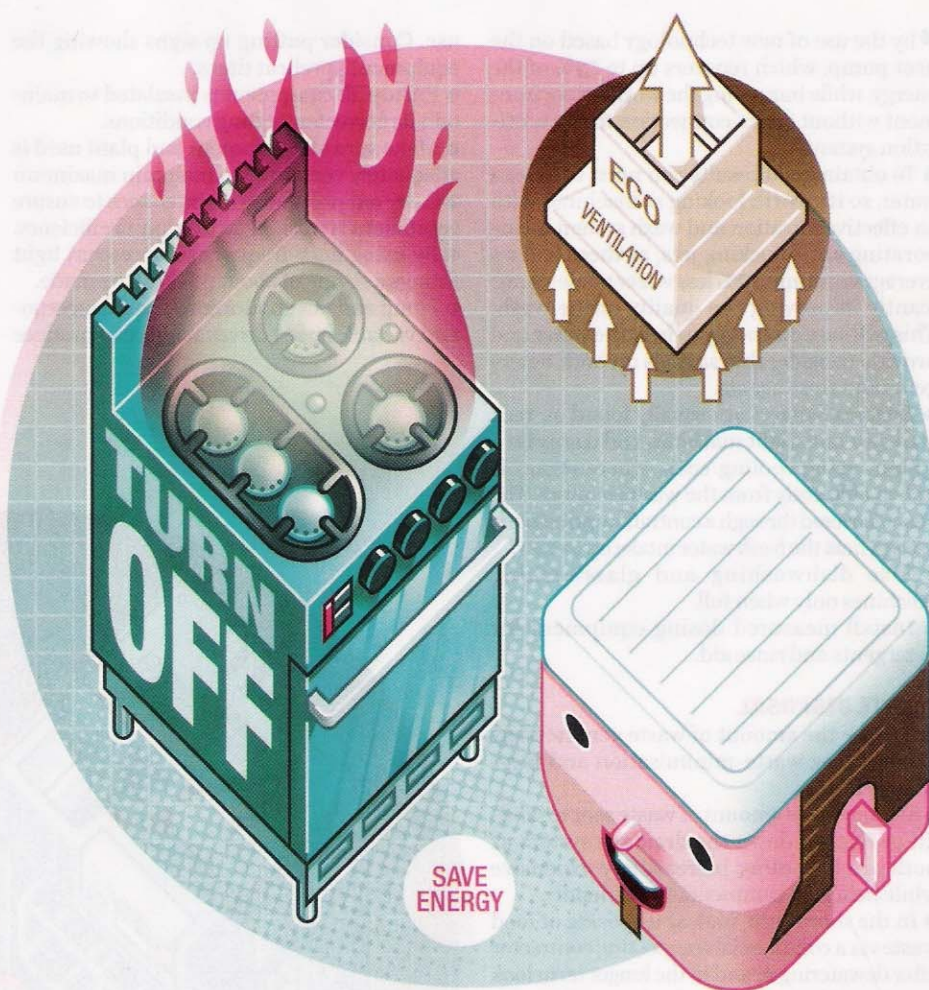
- Install radiators with thermostatic valves in the kitchen areas to provide background heating. This will stop operators from running the equipment to provide comfort heating on cold mornings and avoid the need for portable electric heaters.

- Filter oil and wipe out the pan on a regular basis so that fryers work at maximum efficiency and the life of the oil is extended, thus saving money and reducing waste.

SERVERY COUNTERS

- Use time switches to control display lighting.

- Use ceramic heaters to provide overhead heating on servery counter displays, and compact fluorescent lamps for display lighting. This offers better control, which can save up to 80% on energy used while reducing main-



tenance costs as this solution can last up to 10 times longer than conventional quartz heat lamps.

- Ensure all units are well insulated to avoid heat loss or gain.

- When units are not being used to display hot or cold food, switch them off and use the fluorescent light fittings to create ambience.

UTENSIL WASH

- Drain heat recovery is found on some of the latest machines. Fresh rinse water is heated from 15°C to 45°C using waste heat from the machine drain water. The rinse water is drained from the machine through a pipe enclosed within the water inlet pipe and heat

from the rinse drain pipe is transferred to the incoming cold water.

- Install measured dosing equipment for detergents on both sinks and machines.

- Whenever possible, operate the pot-wash machine only when you have a full load.

WASH-UP

- All commercial dishwashers require water, energy and detergents for them to perform successfully, therefore a machine that makes the most effective use of these elements should be selected. Effective filtration and wash systems allow the rinse water consumption to be reduced, saving water, energy and detergents. This has been further enhanced ▶

"Use machines only when full... and install measured dosing equipment for detergents"

◀ by the use of new technology based on the heat pump, which recovers up to 59% of the energy, while improving the working environment without direct connection to the ventilation system.

● To obtain good results you must use clean water, so it's worth looking at machines with an effective filtration and wash system incorporating anti-blocking jets, as these will on average consume 30% less water while significantly improving the quality of the wash. This will save on energy to heat the water and provide considerable savings on both detergents and rinse agents.

● Heat exchangers are usually found on rack conveyor and flight machines and comprise a system using cooling coils, where steam is drawn efficiently from the wash chamber. The heat recovered through a contraflow principle is used to heat the fresh water intake up to 50°C.

● Use dishwashing and glasswashing machines only when full.

● Install measured dosing equipment for detergents and rinse aid.

WASTE DISPOSAL

● Reduce the amount of waste generated by encouraging waste-minimisation and recycling practices.

● Minimise the amount of waste sent to landfill or flushed down the drainage system as both are becoming increasingly expensive while being environmentally unfriendly.

● In the short term, look at disposing of food waste via a commercial composting contractor after dewatering it, and in the longer term look at systems that collect the food waste from site and use it to produce a renewable energy source. When the latter system is used for establishments that produce more than 1,500 covers per day, it will normally provide an economic payback within four or five years while providing an immediate environmental benefit.

GENERAL

● Monitor utility consumption on a regular basis and relate energy and water consumption to the number of meals produced.

● Check regularly and identify any equipment that's switched on but not in use and report those findings back to staff.

● Train staff not to switch equipment on until it's needed and switch it off immediately after

use. Consider putting up signs showing the equipment's preheat times.

● Ensure all equipment is insulated to maintain its correct operating conditions.

● Make sure all equipment and plant used is adequately ventilated to maintain maximum

● Carry out preventive maintenance to ensure equipment is working to maximum efficiency.

● By using high-frequency fluorescent light fittings a saving of about 20% can be made.

● Pump and fan applications should incorporate variable speed drives as this can produce

major savings. Speed control is a much more energy-efficient method of regulating flow than throttles, dampers or recirculation systems.

● When buying replacement equipment, make sure it's the most energy- and water-efficient. Produce the whole life-cycle costing, including disposal costs. The purchase price can be as low as 10% of the whole life-cycle cost.

→ David Clarke is a professional member of the Foodservice Consultants Society International UK and a committee member of the Catering for a Sustainable Future Group.

