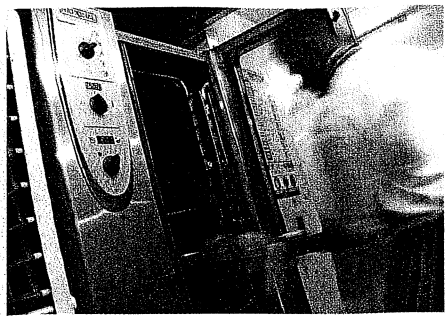

Combi-ovens are substantial users of water

Boilerless combis, which generate steam by spraying water on to the heat exchanger which produces convection heat, can make a difference, with average water usage on a 10-grid oven dropping to about 12 litres an hour. Nick Bates, research and development chef at Angelo Po, which produces an extensive range of boilerless models, believes this design is inherently more energy-efficient in that it uses water only as and when it's needed.

Specialised appliances like the US-made Accutemp Steam 'n' Hold oven, which is designed to steam-cook up to six pans of food at a time using patented vacuum technology, can offer an energy-conserving alternative. UK importer MCS Technical Products claims it can get by with only 20-25 litres of water a day.

Another answer to appliances which are profligate energy-users when left on for long periods – like atmospheric steaming cabinets and pasta boilers – is a specialised unit like the Round Up Variety steamer, which produces super-heated dry steam on demand – for example, to cook a portion of pasta – and therefore uses energy only when needed.

LOGO POWER

Some idea of the importance now attached to energy efficiency in the kitchen by cooking equipment makers can be gauged from the Enodis UK Foodservice Group's introduction last month of an "Enerlogic" logo, a cross-brand initiative which relates to specific models in five cooking equipment series (Convotherm, Frymaster, Dean, Cleveland and Garland). The logo highlights models that meet Energy Star and CEE (Consortium for Energy Efficiency) standards as laid down by the internationally recognised body ASTM.

CASE STUDY

It's easy to see that there must be a substantial energy input in the prime cooking element of a catering facility. But is this energy input always provided in the most efficient way?

At first glance one could be excused for believing the only option is to pass the problem back to the equipment manufacturers to improve the efficiency of their equipment – the equipment used within the industry in a large number of cases is only 50% efficient, while the domestic market has to achieve 86% – but while this option is actively being pursued by the manufacturing fraternity, it's not the only way forward.

A typical kitchen required to feed 200 people over a two-hour service period for each meal is likely to have the following prime cooking equipment:

- One gas bratt pan.
- Two gas deep-fat fryers.
- One electric filter unit.
- One gas salamander.
- One electric six-grid combi-oven.
- One electric 10-grid combi-oven.
- One gas open-top range.
- One gas solid-top range.
- One electric pressure steamer.
- One electric tilting kettle.

The energy required to power this equipment is 69kW of electricity and 173kW of natural gas, and on average it will have an hourly usage of 43kW of electricity and 108kW of gas, giving a daily usage for electricity of 339kW and 858kW of gas.

In addition to the energy used for cooking, we need to extract 3.72m/sec of air and bring in 3.16m/sec of supply air. This will require 19kW of power every day to power the fans and on average 143kW of heat generated from natural gas to power the heater battery to temper the incoming air (this will be much higher in winter and very much lower in summer).

This means that in total the cooking operation is consuming 358kW of electricity and 1,001kW of natural gas per day at an energy cost of between £51.93 and £42.30 per day, depending on the energy supplier used and the tariffs offered.

By reviewing the requirements it's possible to provide a facility that has a different look to the original line-up with a reduced equipment content and a revised gas-to-electric ratio. This will provide energy savings and reduced carbon emissions:

- One gas bratt pan.
- Two new high-efficiency gas fryers.
- Two new-generation gas combi-ovens (six-grid).
- Two new-generation gas combi-ovens (10-grid).
- One gas open-top boiling table.
- One gas tilting kettle.

The energy required to power the equipment is 2.57kW of electricity and 182.3kW of natural gas and on average it will have an hourly usage of 1.59kW of electricity and 113.03kW of gas, giving a daily usage for electricity of 12.72kW and 904.24kW of gas.

In addition to the energy used for cooking, we need to extract 2.84m/sec of air and bring in 2.41m/sec of supply air. This will require 15.92kW of power every day to power the fans and on average 136kW of heat generated from natural gas to power the heater battery to temper the incoming air (this will be much higher in winter and very much lower in summer).

This means that in total the cooking operation is consuming 28.64kW of electricity and 1,040.55kW of natural gas per day, a saving of 21.3% in energy and 40.6% in carbon emissions.

The energy cost to run this operation is between £31.43 and £25.75 per day, depending on the energy supplier used and the tariffs offered, a saving of between £20.50 and £16.55 per day, or 39.1%.

Because of the new type and style of equipment, when compared with the original, there would be an increase in capital cost to provide this revised option which would be in the region of £1,302.50, which represents 2.5%.

However, even using the lower saving of £16.55 per day, the payback period could be as little as 79 working days.

Source: David Clarke of the Catering for a Sustainable Future Group, made up of food service consultants and equipment manufacturers and distributors, and a member of the Foodservice Consultants Society International UK

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