

# Greener world

More and more companies are going green – and not only because of their corporate consciences.

Green can improve profits and beat the credit crunch, as Brian Wall reports

## Pointers

- Monitoring OEE (overall equipment effectiveness) is a sure way to improve energy usage and productivity, while reducing emissions
- Motors, bearings and belts are being overlooked by most engineering managers for energy saving
- ECLs (environmentally considerate lubricants) are now much more viable
- Tidal turbines are coming and may shake wind energy
- Making environmental stewardship central to plant operations can lead to emissions savings of 35%

Most plants have already implemented a wide range of energy-related programmes – from switch-off campaigns to intelligent production scheduling at lower time-tariffs; and from installing energy-efficient equipment to improving maintenance regimes.

All very commendable, but they're in no way enough on their own. For while such programmes are essential to bear down on energy consumption, there is an even bigger prize: by operating workplaces as effectively as possible, new levels of profitability and competitiveness can be achieved.

No one is more aware of this than Hovis, the bread-producing division of Premier Foods. Every day, it points out, any number of production-related factors can affect a business – unplanned production stops, slow-running equipment and lack of materials – hitting productivity and energy efficiency. By harnessing an Idhammar OEE (overall equipment effectiveness) management system for its 15 bakery sites, Hovis has seen its gas budget tumble by 7% – saving £400,000 a year.

Says Bob King, formerly manufacturing director for Hovis and now group head of operational excellence for Premier Foods: "Optimised OEE has had a hugely beneficial impact on our energy-efficiency programme, which also supports our environmental objectives."

Hovis is a microcosm of initiatives that should be underway throughout plant operations. However, a survey for maintenance, repair and overhaul (MRO) equipment supplier Brammer suggests that plants are failing to capitalise on more than £10 billion of potential energy savings. It finds that, although most are developing and implementing energy-saving plans, most are missing out on the basics.

Ian Ritchie, managing director of Brammer UK, cites motors, bearings and belts, which the survey finds are being overlooked by 59% of engineering managers – even though the Carbon Trust estimates that 65% of a plant's energy is used by motors alone. He believes that fitting more efficient motors and drives could deliver energy savings of up to 15%, equivalent to £5.85 billion, or 47.27 million tons of CO<sub>2</sub> across the EU. "Our findings indicate that there is a great deal more that [engineering managers] could do," he says.

## Better lubricants

Investment in environmentally considerate lubricants (ECLs) is another area that can yield paybacks. So far, take-up has been slow, mainly because of the historic cost and performance differences between these and their cheaper mineral oil equivalents. However, as technology improves, government regulations tighten and businesses increasingly go green, ECLs are becoming more viable – a trend that can only accelerate as concerns about security of supply grow.

"Modern ECLs can match the performance of conventional lubricants, while also offering extended component life, and reduced oil and fuel consumption," says Richard Lonsdale, industrial product marketing manager at Shell Lubricants UK. "So they are a viable alternative to mineral oils – particularly for anyone concerned with the effects of oil leaks."

As he points out, spillage of mineral-based products is increasingly seen as environmentally unacceptable, with pressure to improve performance coming from customers, green groups and regulators. Companies that fail to recognise these pressures could soon find themselves at a competitive disadvantage.

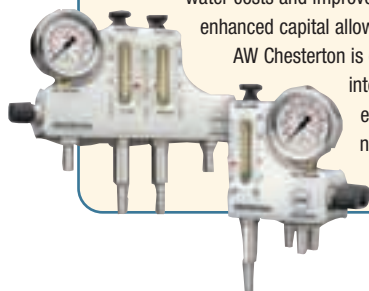
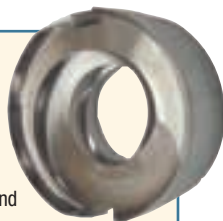
"Even in the most carefully planned and well managed operation, some leakage is inevitable," observes Lonsdale. "But even a leak of one drop

## Water way to go

The Water Technology List – developed and managed by Defra and HM Revenue and Customs, in partnership with Envirowise – helps companies save money by encouraging them to invest in technologies and products that reduce water use and improve quality.

According to Envirowise, manufacturing companies can easily save between 30% and 50% of water and wastewater costs through inexpensive changes to their working practices. "The Water Technology List is making it easy for businesses to make important decisions to improve their water use and water quality, and save money at the same time," says Martin Gibson, director of Envirowise. "Businesses will benefit in the long term through reduced water costs and improved water efficiency and, in the short term, by claiming an enhanced capital allowance."

AW Chesterton is one manufacturer leading the industry forward. An international manufacturer of industrial fluid sealing and engineered polymer solutions, several of its products have now been awarded a place on the coveted Water Technology List.





per second from a machine can give a cumulative fluid loss over a month of about 200 litres. However, when modern ECLs are used correctly, operating lifetimes are impressive, offering an efficient route towards improving both performance and environmental compliance."

What about renewable energy? One recent development that aims to turn the tide is a UK-developed vertical axis turbine that can generate power from tidal movement. This at a time when The Carbon Trust estimates that wave and tidal power could provide a fifth of the UK's electricity.

The Osprey tidal turbine is the brainchild of Cornwall-based FreeFlow 69, research and development consultancy in renewable energy. Following positive initial testing of a reduced-scale model in 2007, a full-size prototype has recently been put through its paces, using a purpose-designed, 30ft-long aluminium catamaran rig, designed and built by Able Engineering of Swadlincote, Derbyshire.

## Turning the tide

Equipped with a hydraulic scissor lift to raise and lower the turbine housing into the water flow, it is powered by two outboard motors. The rig drives the turbines through still water to simulate flow, while instrumentation records power output and torque loading on the contra-rotating blades.

"Viability of the Osprey turbine concept has now been further proven," states Pat Cooke, who heads up FreeFlow 69. "It has performed exceptionally well in the latest trials, with power output on target."

All very encouraging, as is GE Energy's carbon sequestration agreement with Schlumberger Carbon Services to accelerate the use of cleaner coal technology. The deal aligns GE's experience in integrated gasification combined-cycle (IGCC) systems – with proven carbon capture capabilities – and Schlumberger's geologic storage expertise.

So, how does it work? GE Energy's gasification process cleans heavy residues and converts them into a high-value fuel that drives gas turbines in efficient combined-cycle systems (CCS) – either built

from scratch or retrofitted to existing plant.

"This is a first-of-its-kind alliance between leaders in IGCC technology and CO<sub>2</sub> storage to accelerate the commercial development and deployment of cleaner coal power," claims Richard Cordoba, president of GE Energy Western Europe and North Africa. However, while the new arrangement may provide technical and commercial expertise for a sustainable future in coal-based power generation, clear regulations and policies are now needed for large-scale implementation.

Meanwhile, Parsons Reiss, one of the UK's leading suppliers of engineering services and machinery to the tissue, board and paper industry, is equally committed to the environment – and with quite different ideas. It is rigorous in both monitoring emissions, and analysing and treating water and waste – and argues that all reputable companies should take a similar stance.

Says general manager Chris Wright: "The challenge is how to implement an environmental strategy that is sustainable. The industry's holy grail is systems that will get more out by putting less in. But as more companies realise that the energy-efficient changes they can make offer cost reductions, as well as environmental stewardship, new plant operations will become an intrinsic part of a more environmentally sustainable future."

He suggests that proper project analysis and design can lead to plants saving up to 35% on energy – which, in today's climate, is significant. But he adds: "There can be implications, however, on end product, in which case we manage customers' expectations or we work with them to overcome technical issues, ranging from availability of raw materials to capital expenditure available."

That's always going to be key. Not only does industry need greener technology solutions; it also needs the support and input of responsible suppliers able to help them adapt their operations as they implement new technologies and methods – so they are better equipped to deal with the escalating economic pressures that currently beset us all. **PE**



**Modern environmentally considerate lubricants (ECLs) can help in both the workshop and the natural environment, such as the Falkirk Wheel in Scotland, which uses products from the Shell Naturelle range**

**Below: Chris Wright of Parsons Reiss**

