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A big thank you to all who submitted projects for EI Awards 2005. We will be in touch shortly.

The deadline is now closed.

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Part of the marine technology testing laboratory at the New and Renewable Energy Centre in Blyth, Northumberland, which is also developing laboratories to test wind turbine blades, photovoltaic technology and a variety of electrical devices for connection to the grid. See page 14 for the full story.

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Fewer flights rather than more wind farms

George Monbiot writes on environmental issues

The people fighting the new wind farm in Cumbria (see page 8) have cheated and exaggerated. They appear to possess little understanding of the dangers of global warming. They are supported by an unsavoury coalition of nuclear power lobbyists and climate change deniers. But it would still be wrong to dismiss them.

The Whinash project, on the edge of the Lake District National Park, will, if it goes ahead, be the biggest onshore wind farm in Europe, producing, according to the developers, enough electricity for 47,000 homes. Without schemes like this, there is no chance of meeting the government's target of a 20% cut in carbon emissions by 2010. Onshore wind turbines are currently the cheapest means of producing new power without fossil fuels, but at the moment they account for just 0.32% of our electricity. Faced with the global emergency of climate change, it would be criminally irresponsible not to build more.

Last year the Advertising Standards Authority ruled that the 'No Whinash Windfarm' campaign had exaggerated the size and number of the turbines, and the impact they would have on tourism and house prices. Among those who have been supporting the exaggerators are the organisation Country Guardians and the former environmentalist David Bellamy. Country Guardians was co-founded by Sir Bernard Ingham, Margaret Thatcher's press secretary and a consultant to the nuclear industry. David Bellamy is now the country's foremost climate change denier.

But we should try not to judge a cause by its supporters. There are several things which make me uncomfortable about wind energy, and the way in which it is being promoted.

Wind farms, while necessary, are a classic example of what environmentalists call an 'end of the pipe solution'. Instead of tackling the problem – our massive demand for energy – at source, they provide less damaging means of accommodating it. Or part of it. The Whinash project, by replacing energy generation from power stations burning fossil fuel, will reduce carbon dioxide emissions by 178,000 tonnes per year. This is impressive, until you discover that a single jumbo jet, flying from London to Miami and back every day, releases the climate change equivalent of 520,000 tonnes of carbon dioxide per year. One daily connection between Britain and Florida costs three giant wind farms.

Alternative technology permits us to imagine that we can build our way out of trouble. By responding to one form of over-development with another, we can, we believe, continue to expand our total energy demands without destroying the planetary systems required to sustain human life. This might, for a while, be true. But it would soon require the use of the entire land surface of the United Kingdom.

Consider, for example, the claims being made for hydrogen fuel cells. Their proponents believe that this country's vehicles could all one day be run on hydrogen produced by electricity from wind power. I am not sure that they have any idea what this involves. I haven't been able to find figures for the UK, but a rough estimate for the United States suggests that the same transformation would require a doubling of the capacity of the national grid. If the ratio were the same over here, that would mean a 600-fold increase in wind generation, just to keep our wheels turning. If we were to seek to compensate for the emissions produced elsewhere, there is no end to it. The government envisages a rise in British aircraft passengers from 180 million to 476 million over the next 25 years. That means a contribution to global warming equivalent to the carbon savings of 1094 Whinash's.

There is, in other words, no sustainable way of meeting the current projections for energy demand. The only strategy in any way compatible with environmentalism is one led by a vast reduction in total use. Greenpeace and Friends of the Earth, who support the new wind farm, make this point repeatedly, but it falls on deaf ears. What is acceptable to the market, and therefore to the government, is an enhanced set of opportunities for capital, in the form of new kinds of energy generation. What is not acceptable is a reduced set of opportunities for capital, in the form of a massively curtailed total energy production. It is not their fault, but however clearly the green groups articulate their priorities, what the government hears is 'more windfarms', rather than 'fewer flights'.

I would like to see the green NGOs publish a statement about where this kind of development should stop. At what point will they say that too many windfarms are being built, and ask the government to call a halt? At what point does the switch to the decentralised, micro-generation projects they envisage take place?

But this is not the only way in which environmentalists' support for windfarms makes me squirm. The joint statement about the Whinash project published by Greenpeace and Friends of the Earth complains that "opponents of the scheme, which would be sited beside the M6 motorway, have claimed that the wind turbines will spoil the views, failing to acknowledge that the presence of a motorway has degraded the landscape". It quotes Friends of the Earth's energy campaigner Jill Perry, who says, "I'm amazed that people are claiming that the area should be designated a National Park. What kind of National Park has a motorway running through it?" Well the New Forest and South Downs national parks, for a start. Their creation was supported by Friends of the Earth.

Elsewhere, these groups oppose the 'infill' around new roads. Elsewhere, they argue that landscapes and ecosystems should be viewed holistically: that they do not stop, in other words, at an arbitrary line on the map, like the boundary of a national park. I understand that green campaigners are placed in an uncomfortable position when arguing for development rather than against it. But I do not understand why they have to sound like WalMart as soon as the boot is on the other foot.

I believe the Whinash windfarm should be built. But I also believe that those who defend it should be a good deal more sensitive towards the concerns of local objectors. Why? Because in any other circumstances they would find themselves fighting on the same side. ●

www.monbiot.com

Regulatory uncertainty 'threatens investment in power'

The world's utility companies have warned that regulatory uncertainty is holding back the investment needed to secure future power supplies, according to: *Under Pressure*, the seventh annual PricewaterhouseCoopers Global Utilities Survey.

While a majority of investors believe deregulation is helping the investor climate, more than a third say that market reforms are damaging confidence – highlighting the dangers of inconsistent regulation, energy, tax and environmental policies, adds PwC.

This anxiety within the utilities industry means that, despite its growth prospects, it is failing to attract the investment it needs. Meeting projected supply needs will require an investment of $12.7 trillion in the period to 2030 in the power generation, transmission and distribution and gas supply infrastructure. However, the utilities sector is failing to rise above the pack when it comes to attracting investment.

Utility leaders feel that without regulatory certainty and high levels of investment, blackouts could become a more frequent occurrence. In fact, two thirds of utility company respondents in the report believe the likelihood of blackouts will increase or remain the same, and these concerns about security of supply are spreading across the industry. Nearly three-quarters of utility company respondents say that supply security and transmission capacity are major concerns facing the sector – up from 65% in 2004.

The regulatory uncertainty is also affecting investment in renewables, says PwC. While the focus on renewables is increasing, investors feel this area will face the biggest funding challenge, so creating a new vulnerability for the sector. In this climate, just over half of utility respondents expect a nuclear revival.

UN finds huge solar and wind potential in developing countries

The potential for thousands of megawatts of new renewable energy in Africa, Asia, South and Central America have been discovered by a project to map the solar and wind resource of 13 developing countries. The multi-million dollar project, called the Solar and Wind Energy Resource Assessment (SWERA), is proving that the potential for deploying solar panels and wind turbines in these countries is far greater than previously supposed.

The United Nations Environment Programme (UNEP) is coordinating SWERA on behalf of more than 25 institutions around the world.

The SWERA team has assessed wind and solar energy resources using a range of data from satellites and ground-based instruments – often with surprising results. In Nicaragua, for example, SWERA assessments of wind resources demonstrated a much greater potential than the 200 MW estimated in the 1980s.

The results prompted the Nicaraguan National Assembly to pass the decree on promotion of wind energy that gives wind generated electricity 'first dispatch', ie priority over other options when fed into electricity grids. The US Trade and Development Agency and Inter-American Development Bank have subsequently launched wind energy feasibility studies in Nicaragua, and wind investment projects are now advancing with 40 MW planned in two projects.

SWERA information is also providing solar resource information for a range of cooperative efforts in Nicaragua between groups such as the World Bank for projects focused on rural electrification. Six thousand solar PV systems, for example, are being installed there in the World Bank and Inter-American Development Bank rural electrification programmes.

In Guatemala, wind estimates before SWERA were mostly unknown, but are now estimated at 7,000 MW. The Guatemala Ministry of Energy has established, with support from SWERA, the Centre for Renewable Energy and Investment within the Ministry to carry out validation studies and identify sites for wind energy development.

Meanwhile an initial assessment in Ghana, reveals more than 2,000 MW of wind energy potential, mainly along the border with Togo. In Africa, this is quite a significant amount, as by some estimates, the continent needs just 40,000 MW of electricity to power its industrialization.

"As energy planners seek cleaner energy solutions using renewable energy technologies, the availability of reliable, accurate, and accessible solar and wind energy information is critical and can significantly accelerate the deployment of these technologies," says Klaus Toepfer, UNEP's Executive Director. Toepfer cited the case of California, where the availability of good wind data had greatly accelerated the development of windfarms there.

New, better peat-fired station for Ireland

Ireland has a new, 100 MW peat-burning power station. The Electricity Supply Board (ESB)'s new Lough Ree power station at Lanesboro, County Longford, was opened in April. Foster Wheeler's Finnish subsidiary, Foster Wheeler Energia Oy, was the engineering, procurement and construction (EPC) contractor and boiler supplier for the plant.

The new station, one of the world's largest peat-fired plants, represents an investment of more than €200 million by ESB and replaces a peat-fired power station which has been operating on the site since 1958.

Foster Wheeler is also the EPC contractor and boiler supplier for ESB's new West Offaly power station at Shannonbridge, which is part of the same programme of peat generation modernisation. West Offaly, the largest peat-fired power plant in the world, will be inaugurated later this summer.

The state-of-the-art plant uses Foster Wheeler's advanced circulating fluidised bed boiler technology, the leading technology of its type for burning low calorific value fuel such as peat, other biomass fuels, low-grade coals, and petroleum cokes in an efficient and environmentally friendly way.

"Using this latest technology has allowed ESB to reduce emissions of both NOx and SOx to well under the latest European Union limits," said Bernard H. Cherry, president and chief executive officer of Foster Wheeler's Global Power Group. "Due to its higher efficiency, the new plant produces 30% more electricity for the same fuel input as the older plant. In addition, modern stack cleaning technology means that dust emissions are reduced dramatically."

Mixed progress towards energy liberalisation in Europe

It is nearly a year since the first phase of gas and power market liberalisation officially took place in Europe, in July 2004, when the majority of non-residential power and gas consumers in the EU became eligible to choose their supplier. However, despite this, the liberalisation process in Europe continues to take place at varying speeds, reflecting both the widely diverse levels of energy market development and also disparate attitudes towards the concept of market opening.

Two new reports from market analyst Datamonitor highlight the differing characteristics of the European power and gas markets and show how these are resulting in widely varying degrees of progress towards a harmonised single European energy market.

The fact that the gas and power markets in the EU 25 are at widely differing stages of development and maturity has long been acknowledged as one of the main barriers to bringing about a truly liberalised and competitive single European energy market. According to Datamonitor energy analyst Andrew Hill, "Europe's gas markets range from the high levels of gas penetration and market development prevalent in the UK and Germany to markets such as Finland, Greece, Latvia and Portugal, where the markets were regarded as sufficiently immature and undeveloped by the EU to warrant the awarding of derogations regarding the implementation of the directive. The situation in the power markets is less incongruent, though significant differences remain with regard to generation fuel mixes, grid access conditions and market concentration to mention just a few factors," he says.

The widely differing nature of these markets and the contrasting attitudes towards liberalisation at both a governmental and corporate level inevitably means the degree of progress made in incorporating the terms of the EU gas and power directives into national statute books has also varied widely. This divergence prompted the European Commission to send formal warnings to 18 member states in October 2004, admonishing them for not having either adopted, or sufficiently communicated to the Commission how they had adopted, all of the terms of the directives.

Full compliance with the required laws to the EU's satisfaction has since been carried out by eight of the original 18 member states censured by the EU, though 10 countries are still subject to potential further action by the Commission, Hill says, "It is becoming increasingly necessary for the commission to show strength in admonishing the member states still not in full compliance, given that full market opening is now little more than two years away."

Repeat power barge order from Jamaica

Wärtsilä Corporation has won a repeat order for a 49.5 MW power barge from the Caribbean island of Jamaica. It will join an existing 74 MW power barge delivered by Wärtsilä ten years ago. The new power barge has been ordered by the independent power producer Jamaica Energy Partners LLC, under a turnkey contract.

The new barge will be equipped with three generating sets, each driven by a Wärtsilä 18V46 engine. The barge will be provided with all necessary ancillary equipment for independent operation, including treatment plant for the heavy fuel oil used by the engines and a 138 kV electrical substation.

The barge will be constructed and outfitted in Singapore. Delivery to Jamaica will be in December, just 12 months after the contract was signed. The barge will be located in Old Harbour, Jamaica.

The generating plant has a gross output of 51 MW, giving a net output from the barge of 49.5 MW. The electrical power will be fed into the distribution grid of the utility company Jamaica Public Service Co Ltd.

The earlier 74 MW power barge, 'Dr Bird', was delivered to Jamaica in 1994. It is equipped with eight Wärtsilä 12V46 generating sets and is also operated by Jamaica Energy Partners.

Power barge in Jamaica's Old Harbour

US military leads green power purchases

Perhaps surprisingly, the largest US buyer of 'green power' in the US in 2004 was the US Air Force, which bought more than 320,000 MWh of renewable energy, with bases in California, Texas, New Mexico, Washington, and North and South Dakota leading the way.

The US Environmental Protection Agency's (EPA) list of the top 25 buyers of green power participating in its Green Power Partnership also includes the US Navy, alongside more predicatable agencies: the EPA itself, the US Department of Energy (DOE), the US General Services Administration, and the World Bank.

The top companies on the list include Johnson & Johnson, Whole Foods Market and WhiteWave Foods. Together, the top 25 EPA Green Power Partners are buying more than 1.6 million MWh of renewable power each year.

However, the US Department of Defense (DoD) prefers the energy security benefits of on-site production of renewable energy, reports the DOE. A recent study found the potential for 70 MW of wind power on-site at 109 DoD facilities, as well as three or four possible sites for geothermal power plants, six to eight possible sites for geothermal heating systems, and 430 locations where some form of solar energy use is practical.

Gas supplier buys Spanish wind energy company

Spain's largest gas supplier, the Gas Natural Group, has finalised a €272 million deal to acquire a 100% interest in the energy company Desarollo de Energías Renovables S.A. (DERSA).

Established in 1996 and based in Navarra, DERSA is one of the main companies in the Spanish wind energy market. Previously it was owned by the Caja Rural de Navarra and other local shareholders. The company has interests in wind energy plants throughout seven autonomous regions, with a current output of 470 MW and a potential output of 1,230 MW in projects at the development stage.

Having concluded the deal, the Gas Natural Group, with over 600 MW of wind energy currently in production and over 1,200 MW under development, becomes the lead player in the Spanish wind energy sector. It has a presence in nine autonomous regions: Catalonia, Aragón, Navarra, La Rioja, Cantabria, Galicia, Andalucía, Castilla y León and Castilla-La Mancha.

Summer power shortages threaten China's cities

At least two Chinese cities face electricity shortages this summer as currently installed generation capacity struggles to meet peak demands. The predicted shortages highlight the potential for new on-site and renewable generating capacity to make a contribution to China's energy supply portfolio.

Beijing's Municipal Development and Reform Commission is reported to have set charges for the use of electricity in the city at peak hours at more than quadruple the charges in low-use periods for this summer. The new peak-hour price, the first of its kind in China, was set to alleviate the capital's imminent pressure on the power supply.

The Commission has also decided to interrupt power supplies to industrial users periodically so that no important construction programmes related to the 2008 Olympic Games will be blacked out. Meanwhile, the Commission called on governmental institutions and citizens to be more aware of power shortage and save as much electricity as possible.

Officials are reported to predict that the peak electricity demand in Beijing will be 10.7 GW this year, up 13% over the same period of last year, and a power shortfall of at least 1 GW is predicted. Although Beijing has planned to invest more than 2 billion Yuan to renovate its power supply networks and coordinate with power grids in other parts of China this year, the country's aggregated power shortfall is predicted to be 20 GW.

Meanwhile, authorities in Shanghai are reported to be preparing for power shortages this summer by ordering more than 3,000 companies to close for a week. The state-run Xinhua news agency has reported that Shanghai will have an electricity shortfall of 2,000 MW, based on total demand of 19,000 MW during the summer months when electricity consumption is at its peak.

A spokesman from the Shanghai Economic Commission has said an estimated 3,000 companies would be required to shut down for one week each in staggered stages in July August this year. Municipal authorities are to order an additional 400 to 500 industrial companies to reduce peak hour power use for a three month period by switching to off peak shift production or temporary closures.

Offshore wind energy 'could supply 10% of Europe's electricity'

Offshore wind farms will be able to supply about 10% of Europe's electricity needs by 2020, according to anew report from Greenpeace: *Offshore Wind - Implementing a New Power House for Europe*.

The report explains how an electricity grid in Europe is needed to integrate offshore wind farms into the power system. According to the report, one of the critical parts of the energy solution in Europe will be to integrate 70,000 MW of offshore wind capacity into the existing electricity grid. This will require a power grid at sea, as there is none at the moment.

Europe is facing a profound transformation of its energy system over the next few decades. In this time frame, governments and utilities will decide on the next generation of power plants, replacing some fossil fuels with renewable energies and dramatically increasing energy efficiency, says Greenpeace. The new report, which was written by Deutsche WindGuard GmbH, shows that wind energy is a critical part of the solution.

The newly-inaugurated solar photovoltaic system installed at the German School in San Salvador, El Salvador, is thought to be the largest in Central America. Installed by Germany's Phönix SonnenStrom AG, the installation is part of a programme operated by the German Energy Agency, dena, to open up international markets for solar technology.

The peak output of the San Salvador installation is 20 kW and the array is expected to generate some 30 MWh of electricity annually for use at the school or, on non-school days, exported to the local utility grid. The project was financed as a public-private partnership by the German Federal Ministry of the Economy and Labour, Phönix SonnenStrom AG, SMA Technologie AG, Rosendahl Energietechnik GmbH and private sources in El Salvador.

Productivity, energy and industry revert to DTI as nuclear debate opens up again

The new Department of Productivity, Energy and Industry (DPEI) – which replaced the Department of Trade and Industry immediately following the general election – lasted just a week before reverting to the plain old DTI again. Nobody liked the new name. Led by Secretary of State Alan Johnson, the new (old) department also houses new Minster of State for Energy Malcolm Wicks, MP for Croydon North and "one of the most intellectually able ministers in the government", according to the BBC.

But the elevation of the word 'energy' may no more than herald the re-opening of the nuclear debate. According to too many newspaper reports to ignore (and first mentioned in the April issue of *EW*), one of Alan Johnson's first jobs in his new position was to study an internal report from DPEI civil servants which, it is reported, makes a strong case for a quick and positive decision on building a new generation of nuclear power stations as part of efforts to keep carbon dioxide emissions under control.

The argument is familiar to readers of *Energy World*: national carbon dioxide emissions have ceased falling and, faced with the phased closure of Britain's existing nuclear fleet over the next two decades or so, no feasible amount of growth in renewables or switching from coal to gas, can compensate. And the decision on new plants must be taken very quickly as the lead time from initial decision to operating the first plant is around a decade.

Reports go on to speculate that the make up of the new Government is more pro-nuclear than the last, which set the current policy of keeping the nuclear option open but without any encouragement in the 2003 Energy White Paper.

However, the DPEI report can only be the start of a lengthy debate on the subject, with the question of how any new nuclear plants are to be financed being perhaps the most difficult to answer. Assuming that some sort of government support proved necessary, it is also unclear how subsidised plants would operate within the liberalised electricity market. So far, there has been no comment from the DPEI.

• Meanwhile, the Nuclear Decommissioning Authority has established a board of enquiry to investigate a serious pipework failure which closed the Thorp nuclear reprocessing plant in April. The leak is reported to involve both uranium and plutonium dissolved in nitric acid, and could take months to repair. NDA chairman Sir Anthony Cleaver said, "The failure clearly poses a significant problem, and illustrates the scale of the challenge the NDA faces as we seek to form a comprehensive and accurate picture of the assets and liabilities we inherited on April 1st, and to plan our programme of decommissioning."

Triodos launches renewables share issue

The Triodos Bank has launched the Triodos Renewables share issue that aims to raise £5 million from the public to invest in a series of sensitively sited renewable energy projects across the country. As well as a direct stake in clean energy projects, shareholders could earn a very competitive financial return, with projections of annual dividends rising to over 12% within five years, says the Bank. Minimum investment is £980.

The Triodos Group has already financed over 150 wind farms in Europe. "Having pioneered renewable energy finance since the Chernobyl disaster in the 1980s, we have developed unrivalled expertise," says Triodos Renewables Fund Manager, James Vaccaro. "And with wind farms becoming increasingly efficient using tried and trusted technology, and clear Government incentives for clean energy generation, the UK has become a land of opportunity for renewable energy investment."

The Fund plans to invest the money it raises in a variety of developments, including projects helping farmers to find alternative sources of income, acquisitions of some of the UK's best new renewable energy projects and a small stake in a large offshore project. Investors can call free on 0800 056 2761 to order a prospectus.

The Artemis Intelligent Power Ltd project has launched its new hydraulic car, built with technology that could, says the company, cut car emissions by 30%. The Energy Saving Trust (EST) provided nearly a quarter of a million pounds to fund the project, providing a grant as part of the New Vehicle Technology Fund (NVTF) programme, which is designed to help the development and demonstration of innovative low carbon vehicle technologies.

Artemis has been working with Dana Corporations for over two years to develop and build a hybrid car using high-tech hydraulic transmission systems. The 'digital displacement' technology, in development in Edinburgh for a decade, promises to give fuel savings comparable to those of an electric hybrid car, but in a smaller, lighter and low cost package.

The seemingly normal diesel Ford Focus unveiled in front of then Transport and Scottish Secretary, Alistair Darling (left) hides an infinitely variable automatic transmission system and regenerative braking technology under the bonnet.

Ten new Mercedes-Benz Unimog U300 vehicles, equipped with powerful winches for stringing power cables and handling conductors and insulators, have been delivered to National Grid Transco.

These powerful, compact all-terrain implement carriers are able to access the most difficult and remote off-road sites and drive the 6 tonne capstan winches using hydraulic power take-off direct from the Unimogs' Euro 3 diesel engines.

A rear-fitted anchor 'plough' system and, if required, forward mounted anchor fittings, allow the winch to create the right tension to string cables between overhead powerline pylons.

The winch also enables conductors and insulators to be lowered or raised on even the highest pylons – up to 100 m.

Innovation awards for fuel cell and tidal energy companies

Cambridge-based CMR Fuel Cells is the overall winner of the Carbon Trust Innovation Awards 2005, which recognise the work of organisations that are developing and deploying innovative technologies or energy efficiency measures that help reduce the UK's carbon emissions.

CMR Fuel Cells, which also won the individual and small business category award, says it has developed technology which has the potential to make fuel cells commercially viable for the first time.

The winners in the five categories are:

- *Individual and small businesses award* – CMR Fuel Cells for its innovative fuel cell technology;
- *Larger companies and public sector organisations award* – SMD Hydrovision for its innovative tidal turbine system;
- *Innovation in energy efficiency* – Marks and Spencer for its development of a remote integrated energy management system;
- *Academic institutions* – Oxford University for its development of technology that will help to exploit the commercial potential of methane; and
- *Overall innovator of the year* – CMR Fuel Cells.

CMR Fuel Cells says it has developed unique, patented fuel cell technology which delivers the low-cost, long run-time power solutions that portable electronic products demand. Major issues with today's fuel cells – cost, size, complexity and fuel availability – have ensured that they remain an unfulfilled promise. However, CMR technology changes this – reducing the cost of a fuel cell stack by up to 80% and the size by up to 90%.

Newcastle-based SMD Hydrovision has been developing the 'TidEl' concept – an innovative moored free stream tidal turbine system – since 2002. The system minimises initial capital cost while reducing subsea complexity, says the company. In the UK alone there is the potential to install 7000 MW of plant that, by the nature of tides, can produce predictable, carbon-free power with load factors approaching 50% in some locations.

The University of Oxford has developed catalysts for use in collecting and exploiting methane that work particularly well in low-pressure conditions suitable for widespread distributed use. The catalysts can be used to transform the methane into hydrogen for use with fuel cells or into pure liquid fuels that can be used for engines or heating and are easy to transport.

The Marks and Spencer Group has developed a system which integrates the remote management of refrigeration, HVAC and electricity exception reporting. The systems are still in their final stages of development but the Group is already achieving major benefits in energy efficiency as well as improvements to plant performance.

Co-operation deal for Norwegian gas

A new treaty signed between the UK and Norway could secure up to 20% of the UK's future gas demand. The treaty marks over two years of negotiation that lays the foundation to fast track future cross boundary deals.

The new framework treaty covers a wide range of potential cross-boundary oil and gas developments. In addition to the Langeled South pipeline project, the new treaty will cover the development of future oil and gas fields that straddle the maritime boundary between the two states and the use of offshore infrastructure on one continental shelf to explore for and develop an oil and gas reservoir on the neighbouring shelf.

Then Energy Minister Mike O'Brien said: "This deal helps secure our supply of gas to the UK as we become a net importer".

Wavemaster offshore energy device ready for sea trials

A new device to generate power from the ocean is said to be only a small step away from launch to the renewables marketplace. Ocean WaveMaster Limited, a joint venture between Southcombe Associates and UMITEK Limited, is pioneering the development of WaveMaster, a novel wave energy converter.

After a three phase development plan and £750,000 investment, the WaveMaster is ready for sea trials and then commercialisation. It is anticipated that the sea-going prototype will be fabricated in the North of Scotland, using oil and gas construction techniques and then tested at the European Marine Energy Centre in Orkney.

The device comprises two linked chambers, one of which is maintained at high pressure under the wave crest, and the other at low pressure under the wave trough. The flow of water due to the pressure differentials can then be harnessed to generate power. "WaveMaster extracts energy by using the pressure difference between wave troughs and wave crests. We are currently working on the design and deployment of a prototype to be ready in the autumn, with tests in late 2006," explained Jason Stoyel, managing director of Ocean WaveMaster Ltd.

The first phase of development was a feasibility study funded by a DTI SMART award to develop a theoretical model and small scale test programme. The second phase, co-funded by the Carbon Trust and a consortium of Ocean WaveMaster Limited, University of Manchester Institute of Science & Technology and the New and Renewable Energy Centre (NaREC), saw the construction of a larger model which was tested at NaREC's facility.

Dr Stoyel adds; "Following successful trials, we hope that a Wavemaster, generating between 50 and 100 MW, would be installed offshore the Orkneys and connected to the national grid in early 2008."

New wind farms for South Wales and Norfolk, deepwater wind project moves forward, enquiry at Whinash

A relatively new, British company has won a contract to install turbines for a scheme proposed for South Wales. Meanwhile, the proposed Talisman Energy deepwater wind scheme is moving forward.

REpower Systems AG is to supply sixteen 2 MW wind turbines to wind power developer npower renewables for installation at the Ffynnon Oer project near Neath, in South Wales. npower renewables will be responsible for providing a grid connection and access to the site, in conjunction with Western Power Distribution and the Forestry Commission respectively. REpower UK – the joint venture between wind turbine company REpower Systems AG and engineering company Peter Brotherhood Ltd – will be responsible for installing the sixteen MM70 turbines at the wind farm.

The 58 m high turbines will be manufactured by REpower Systems in Germany, with erection and commissioning likely to begin in the last quarter of this year. In addition to the installation and commissioning, REpower UK will be responsible for providing the necessary civil and electrical infrastructure, as well as a five-year warranty, operation and maintenance package.

Meanwhile, AMEC has won a contract to design and manage delivery of what will be the world's first deepwater wind energy turbines, in the Moray Firth 70 km north east of Inverness, eastern Scotland. The contract, for Talisman Energy (UK) Limited and partner Scottish and Southern Energy, is being partly funded by the Scottish Executive, the DPEI and the European Union.

Two 5 MW turbines will be sited in 45 m of water to be part of a demonstration programme to prove technical and commercial viability of deepwater offshore wind turbines. The scheme will involve leading research bodies across Europe, including Strathclyde and Aberdeen universities.

Deepwater wind farms are less visually intrusive than land-based or shallow-water wind farms. However, their remoteness presents a challenge in transmitting electricity back to shore. These turbines will be located near to Talisman's Beatrice oilfield where existing infrastructure and connections will be modified to accept electricity from the turbines for onward transmission to shore. The field's production platforms will also provide a base to carry out turbine monitoring and maintenance.

Subject to planning approval, installation will be carried out during summer 2006.

Staying offshore, the proposed Sheringham Shoal offshore wind farm is being developed by Scira Offshore Energy Limited, which was awarded a licence to develop the wind farm in December 2003 by the Crown Estate. The company is now undertaking an environmental impact assessment and consulting with stakeholders and the general public. The wind farm is likely to contain between 60 and 90 turbines, with a maximum output of approximately 315 MW of electricity.

• Back onshore, a public enquiry has opened into plans by Chalmerston Wind Power to build a wind farm at Whinash, close to the M6 motorway in Cumbria. The £55 million, 27 turbine farm would be located between the Lake District and Yorkshire Dales national parks, a location which has split public opinion and led to the enquiry. Environment groups Friends of the Earth and Greenpeace actively support the project, while countryside and some local groups are in opposition. See also *Viewpoint* on page 2.

Energy from waste 'must not be overlooked'

The scope for energy-from-waste is enormous, according to a new report: *Quantification of the Potential Energy from Residuals in the UK* from the Institution of Civil Engineers (ICE) and the Renewable Power Association (RPA). The report concludes that there is the opportunity for certain types of waste to produce up to 17% of electricity generated in the UK by 2020.

More than half of the almost 30 million tonnes of household rubbish sent to landfill in England alone in 2003 could be used to create electricity, it adds.

Gaynor Hartnell, Director of Policy at RPA, said, "Many of our European neighbours excel at both recycling and energy recovery. Producing energy from waste after recycling targets have been achieved is environmentally sound and will help us meet both our renewables targets and help us minimise the amount of waste going to landfill. It also helps with energy security, through reducing dependence on energy imports."

Peter Gerstrom, Chairman of ICE's Waste Management Board, commented, "It is patently not in the UK's interest to allow the energy, enough to power the population of Wales and Northern Ireland every year, to go to waste by being buried. Radical thinking about alternative energy, such as that highlighted in this report, is required to ensure the safety and diversity of the UK energy supply."

Energy firms win Queen's Awards

Several companies with energy and power connections were amongst this year's winners of the Queen's Awards for Enterprise, including:

- two exporters of diesel engines and generating sets – Perkins Shibaura Engines and Indamex;
- a provider of retail electricity and gas supplies – Viridian Energy Supply t/a Energia;
- a company which turns ash produced by coal-fired power stations into useable raw building materials – ScotAsh;
- a developer of an integrated mobile power supply system for leisure boats, motorboats and caravans – Sterling Power Products;
- a manufacturer of an ultra low noise radar power supply – TMD Technologies; and
- a company involved in the development, construction and operation of renewable energy generation sites in the UK and overseas – Renewable Energy Systems Group.

The Queen's Award for Enterprise is a highly prized endorsement of commercial success. Winning companies are entitled to use the Queen's Award emblem on goods, packaging and marketing materials for five years as a symbol of their business achievements.

The Warwickshire County Council-owned Optima Innovation Centre at Elliot Park in Nuneaton is the largest PV installation in the West Midlands. In an impressive project that involves 105 kWp of solar capacity, BP PowerGlaz building-integrated laminate panels have been installed on the southern facing façade of the building, together with a Kalzip construction system housing 573 solar panels on either side of the East and West facing roof.

The installation will generate solar electricity for up to 46 businesses based at the centre. It is expected to produce a total annual output of 69 MWh. Environmental benefits include an annual saving of 48 tonnes carbon dioxide emissions.

The south facing façade of the building is fitted with 52 bespoke PowerGlaz units produced by BP's partner-manufacturers Romag. They fit onto a vertical screen frame which has high visual impact as well as additional shading control. In what is said to be a UK first for the solar industry, the façade PowerGlaz panels have been mounted onto a curved array, using bolted glass technology.

First biodiesel goes to refinery

Commercial production at the UK's first large scale biodiesel plant has started, with the first tanker-load of the green road fuel, made from used cooking oil and tallow, being picked up from the Argent Energy plant at Motherwell in Scotland by Petroplus. The product will shortly be available at forecourts.

The load is part of a contract between Argent Energy and Petroplus which could see up to 25,000 tonnes of biodiesel a year making its way to refineries in Grangemouth and on Teesside. There it will be blended with mineral diesel. The resultant blend of 95% mineral diesel to 5% biodiesel will be marketed under the Bio-plus brand on filling station forecourts. It requires no changes to the logistics of the fuel supply chain or to vehicle engines.

Dr Stephen Thomason, marketing director of Petroplus said: "We are delighted that this new source of supply has come on stream allowing us to extend the availability of Bio-plus. It has been subjected to extensive independent testing and the results show that it's good for engines and for the environment. It improves engine lubrication, improves fuel efficiency, it burns more completely thereby reducing emissions and it's virtually sulphur free. Above all biodiesel reduces carbon dioxide."

UK 'set to miss 2050 emissions target, nuclear could be cheaper'

The government will fail to meet its target of a 60% reduction in greenhouse gas emissions by 2050 unless it significantly steps up the switch away from fossil fuels, according to new research by independent economics consultancy, Oxera. Managing Consultant Robin Smale says that the Government's figures indicate a deficit between actual and targeted emissions of 40–60% by 2025, if the Climate Change Programme remains unchanged.

Smale said: "The cost of closing this carbon reduction deficit will run into billions of pounds. Given the size of the targets, the government is faced with some tough decisions. At the moment, the two options available are increasing the amount of nuclear-generated energy or increasing renewables at the taxpayer's expense – neither of which will be popular."

Smale's conclusions are based on an analysis of likely improvements in carbon productivity, the ratio of economic output to carbon emissions. Oxera calculates that the government's 60% target for 2050 equates to an annual 1.9% reduction in emissions. To achieve this, against a trend of rising national income, Oxera says that carbon productivity would have to improve by 4.2% per annum. However, historical data indicates this is unlikely to be achieved: between 1970 and 2000, carbon productivity increased by only 3% per annum.

Furthermore, the Government's own report to the United Nations Framework Convention on Climate Change on the UK's progress towards compliance with the Kyoto Protocol anticipates annual growth in carbon productivity of only 2.25%.

Robin Smale commented: "The big question now is how much of the target will be delivered through improvements in energy efficiency, switching to the less carbon-intensive fossil fuels and burying carbon dioxide underground, and how much will be delivered by switching away from carbon-emitting energy sources altogether." Oxera's research indicates that carbon-burying and a shift away from fossil fuels will have to deliver the overwhelming majority of the target.

The Government has calculated that renewables – which, in the UK, will consist almost mostly of wind power – cost around £12 billion more in net present value terms than conventional generation, for the current programme. Using some illustrative estimates, Oxera has calculated an equivalent figure for a nuclear power replacement programme of similar output to the renewables programme. The total injection of public capital would be around £1.1 billion, and publicly backed debt guarantees would be around £3.3 billion. In addition, public liability insurance would be required.

Robin Smale said: "From the point of view of the taxpayer, nuclear energy may be a strong contender, given its costs relative to wind farms."

Trading in carbon emissions – how to ensure compliance

The EU Emissions Trading Directive – which came into force in January 2005 – promises to reduce carbon dioxide emissions by placing stringent limits on businesses' 'freedom to pollute'. Here, LogicaCMG's John Chennells *discusses the need for companies involved to ensure they have the correct systems and processes in place to comply.*

The European Union has taken steps to reduce the pollution from its member states. In October 2003 it established an Emissions Trading Directive, which led to the launch of the world's largest international emissions trading market on 1 January 2005.

The Emissions Trading Scheme (ETS) is a key component of the directive and at the moment affects organisations within power generation, oil refining, steel, building materials, pulp and paper plus mineral product sectors – literally thousands of companies. These may be joined by many more thousands in 2008 (when the next phase of the scheme starts) from the transport and chemicals sectors. 2008 is also the key date when the full implementation of the Kyoto Agreement means that similar schemes will be implemented in all of the developed countries that are signatories to the Agreement.

Over the last year, the EU has approved limits on carbon dioxide emissions for each of its member states, which in turn gave companies allowances entitling them to emit carbon dioxide – with one allowance effectively giving the 'right' to emit one tonne of carbon dioxide.

Facilities and companies below their limit can sell spare allowances, whilst those above can either buy them or face punitive fines. These fines are set to a level to ensure that non-compliance with the EU Directive is not an option – a fine of €40 per tonne excess which, for the biggest emitters, could mean total fines running into hundreds millions of euros. This fine will be increased in the next phase of the scheme to €100 per tonne, so the pressure to comply is really on – see box.

While the EU ETS is fundamentally about reducing greenhouse gas emissions, it is called a trading scheme because that is the method, which has been adopted to seek out the installations that can achieve the target reductions at the lowest cost. How this trading activity has been progressing to date, and how it might develop in the future, are discussed in our second article.

Allowance prices rise

The agenda for a recent meeting of the working group on the EU ETS within the UK Emissions Trading Group included an item for discussion of recent movements in EU Allowance prices. An EU Allowance, for the emission of one tonne of carbon dioxide, is the standard product traded in the developing EU ETS market. This was prompted by the fact that the market price of EU Allowances had more or less doubled in the previous month, from the level of €8-8.5/tonne where it had remained stable for several months. In the event the discussion, such as it was, petered out within a very few minutes; because if any of those present really knew what had caused such a sudden and dramatic shift in prices, they weren't letting on.

Amongst the few opinions put forward, it was noted that although the volumes being traded are rising steadily, they are still relatively small as a percentage of the total volumes potentially available for trade. The average volume being traded at the time of writing is of the order of 500,000 to 1 million tonnes a day, but this is only equivalent to the annual allowance for a single, medium-sized, gas-fired power station. And in such relatively thin markets, a single organisation can – should they so choose – bid the price up very much to whatever they like. Though whether any individual participants have deliberately sought to move the price of allowances is debatable – under the present market conditions, with only some 50–100 companies actively engaged in trading, such a manoeuvre would be immediately visible.

There is a widespread expectation that, even when the market matures fully, only a relatively small number of organisations (perhaps 150–200) will be actively engaged in trading on a regular basis. Many others will only come to the market occasionally, either to sell spare allowances or (more probably) to purchase additional allowances to cover a shortfall. For this second group, however, there is no great need for urgency; they can make their trades for 2005 at any time during the year. And for this group there is a further disincentive; sellers in particular are hardly going to rush to the market to trade a product which doesn't properly exist yet. Until such time as the allowances from the National Allocation Plans are formally issued, and the national registries are up and running (both of should have taken place by the time this article is published), activity will largely be restricted to companies with a tradition of trading a range of energy commodities.

A further barrier exists for new entrants to the market, particularly those from the new joiners to the EU in central and eastern Europe. As one of the participants at the meeting observed, if potential sellers don't have a credit rating, how do you trade with them? Here at least a fairly immediate answer should be available, as more exchanges open for trading and offer services which include the management of credit risk. It is expected that over the coming months, exchange trading will develop to a similar level to that of the current most common mechanisms, bilateral trading and over-the-counter (OTC) trading through brokers.

As more of the national registries commence operation over the next few months, so too can the volume of spot trading be expected to increase. Denmark was the first country to get its emissions registry operational, and consequently was the location for the first spot trade. And at least one trading house set up a subsidiary in Denmark specifically so that it could commence trading on the spot market at the first opportunity. Once the

registries and the exchanges are fully open for business, it is reasonable to anticipate that a further step change in the volume and liquidity of trading will take place. And as that happens, and the market matures, greater liquidity should not only attract more participants, but also stimulate the development of a derivatives market – enabling companies to trade futures, options and the whole range of derivative products in addition to contracts for physical delivery.

Sky is the limit

The wide-ranging nature of the EU ETS has led to some very bullish predictions about the eventual size of the market. Indeed, market analysts Point Carbon have predicted that the value of EU allowances trading this year could be as much as €2.5 billion in 2005, rising to around €16 billion in 2010, with some 1.7 billion tonnes being traded. And with the Kyoto Protocol coming into full force from 2008, and still more countries adopting their own schemes, it is not beyond the bounds of possibility that greenhouse gases will become some of the world's most heavily traded commodities. In this particular respect the sky is – literally and rather unfortunately – the limit.

The above projections, incidentally, imply an average market price of the order of €10/tonne – much closer to the average price over past months, than to the recent record levels. Perhaps the most plausible explanation for the latter was that traders were reacting to a sharp increase in the wholesale price of gas, which hit a seven-year high in within-day trading at the beginning of March. This, for portfolio generators, meant that the option of burning coal became much more competitive; but also that they needed to purchase additional allowances to cover the corresponding increase in their carbon dioxide emissions. And in a thin market the price rise became inevitable.

Governments and participants alike will be watching closely to see where the price goes next. The higher the price, the more likely it is that more participants will be attracted into the market. And if prices continue to rise to above about €20/tonne, that could have a profound and long-lasting impact on the future of coal-fired generation, as it could encourage generators to switch from coal to gas in the longer term – paradoxically, the opposite of the effect observed in March. But at this stage in the proceedings, with the EU ETS only having been in force since the beginning of the year, we still need to go through a full trading cycle before we can really understand what sort of factors cause the market to fluctuate, and where prices might go in the longer term.

Ultimately, of course, what matters is not the price in the market, nor its liquidity. Trading in the EU ETS is a means to an end, not an end in itself. The scheme will be judged a success if it results in an overall reduction in carbon dioxide emissions within the EU, without shifting the emissions to countries outside the EU. And while there is no question that much more stringent reductions will be needed in the not very distant future, arguably the most important feature of the scheme is that the all-important first step has been taken. ●

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Effective compliance systems are critical

Compliance is not simply about reducing carbon dioxide emissions – it involves organisations managing significant assets, liabilities, operational issues; and, if they so choose, taking part in carbon dioxide trading. Organisations have to track their facilities' carbon dioxide emissions against targets and evaluate options to cut emissions. They then have to decide whether to trade allowances.

Moreover, businesses have to manage these activities across multiple sites and activities, reporting data to government bodies or regulators. All of this is a distraction from their core business – and if companies do not comprehensively plan and manage their compliance with the ETS, they could waste millions of euros through inefficient processes.

To combat this, organisations need to run systems, such as LogicaCMG's Emissions Logic solution, developed in partnership with environmental consultants CarbonSim, that enable them to keep emissions inventories of their installations, to record and settle emissions trades and file reports to regulators or authorities; and to design, test and optimise abatement strategies. Software must be configured for the specific requirements of each company and, for the more progressive, facilitate the optimisation of trading possibilities – a company bringing emissions under target could earn significant profits by trading its surplus allowances.

For those companies participating in the EU ETS, there is a top five checklist for compliance.

1. *Are they using the correct measuring and reporting protocols?*
   Each liable installation has to manage its emissions against defined calculation and monitoring methodologies and reporting protocols. If the correct methodology for its industry sector is not used by a company, its statement of its emissions will not pass the verification process.
2. *Are they confident that a multi-million euro liability is being properly managed?*
   It is a potentially very complex process to reconcile a company's emissions allowances with its actual emissions over multiple sites and countries, not least because reconciliation is carried out at installation level. The largest companies will need to operate a virtual 'clearing house' to optimise the allocation of allowances across their liable installations – not a straightforward undertaking. The reporting of allowances and liabilities on a company's balance sheets is also a complex process and the details of the accounting rules involved are still under discussion.
3. *Are they selecting the most cost-effective measures to reduce emissions and how much could they save by making better-informed decisions across the enterprise?*
   There are many different ways of achieving compliance with the ETS, from reducing emissions via abatement projects to investing in Clean Development Mechanism (CDM) projects in countries outside the EU. To save money and ensure companies make cost-effective decisions, they need to be aware of all of their possible choices and associated costs.
4. *How do they keep track of their emissions and reconcile these with their obligations?*
   The information on companies' emissions may have to be gathered from multiple sources. It is imperative that companies collate and reconcile all of this data with the minimum effort, in the minimum time.
5. *Who is responsible for managing companies' liability and how will it be managed?*
   It is likely that there will be many parts of a company's business, which are affected by the ETS. If all of these areas report in their own way, in their own time, it will be hard to gain an accurate and consistent picture of the organisation's overall position. Companies therefore need to identify a clear line of business responsibility and establish systems and processes, which are accessible as necessary to all concerned. ●

Soft starters for vacuum cleaner manufacturer

The value of energy surveys was underlined recently at Numatic International following the visit of a consultant from the South West Action Energy Scheme. The findings of the survey resulted in the fitting of six Fairford QFE soft starters to moulding machines at Numatic's plant. These units are delivering projected savings of up to £351 per annum, in the best case, on the operation of the moulding machines, a figure that ensures payback for the QFE unit of just one year.

Located in Chard in the South West of England, Numatic International is the UK's largest manufacturer of vacuum cleaners, floor polishing machines and janitorial equipment, producing over 3,000 products per day.

As part of its ongoing drive to efficiency, Numatic recently invited a consultant from the Government Office for the South West Action Energy Scheme to conduct an energy audit at its manufacturing plant. One of the focus areas of the audit was the large motors used on the company's plastic moulding machines. The motors, ranging from 30 to 90 kW, were all controlled by Star/Delta starters, a popular arrangement for AC motors, but one which does not provide any opportunities for energy saving during the motor running stage.

Following the survey a recommendation was made to run a test programme on the moulding machine motors to determine the savings in running costs that could be achieved using soft starters. Two companies were contacted and invited to undertake the test using their own equipment.

The tests compared the energy consumption of the motor with the soft starters in bypass and also (in Fairford's case) in standard energy optimising mode. The results were positive in every case, the average projected saving across six motors was £165 per annum, with the largest being £351 on a 37 kW motor. Based upon these projected savings, six of Fairford's QFE energy optimising soft starters were ordered by Numatic and are now in full operation at the plant.

www.fairford.co.uk

Soft starters from Fairford Electronics provide better energy consumption control for large motors

AstraZeneca cleans up with npower business

Pharmaceutical giant AstraZeneca has signed a three year 'green' energy deal with npower business. Worth in excess of £30 million, it is one of the largest green supply deals that npower business has signed to date.

Historically, AstraZeneca held fixed-term, annual contracts with its energy suppliers, but wanted a smarter way to buy energy which not only benefited the company financially, but also reflected its environmental stance, says npower.

Under the three year deal, npower business will supply the company's 18 UK premises with electricity from a combination of renewable and Climate Change Levy exempt sources. This means that for every kilowatt of green electricity used by AstraZeneca, npower business will buy the equivalent from renewable sources such as wind farms and hydro stations, or cleaner fossil fuel sources such as waste-to-energy and CHP stations.

In the first year, over 30% of the energy, or 50 GW, will come from renewable sources, equivalent to the amount of energy needed to power AstraZeneca's head office, environment centre and an R&D facility.

Another benefit of the new contract is the smarter, open book approach to energy purchasing, which enables AstraZeneca to take a longer term view of its consumption and balance out peaks in energy pricing. This has given the company far greater control and made it easier to budget costs, as Jeremy Delderfield, Utilities Buyer at AstraZenca explains: "We were not getting the best deal by spot purchasing energy for a year because we were often out of phase with the best time to buy. Our search for an opportunity to purchase energy more effectively fitted with npower's drive to develop strategic partnerships with a number of key customers in the UK. The commercial benefits were clear, but the environmental benefits were even more compelling."

www.npower.com

Cutting water costs for aerospace company

McKinnon & Clarke has cut the annual water bills of aerospace solutions provider, Marshall of Cambridge Aerospace (MCA), by £22,000. The energy consultancy has achieved the ongoing saving on MCA's annual water spend of £81,000 following analysis by its water division.

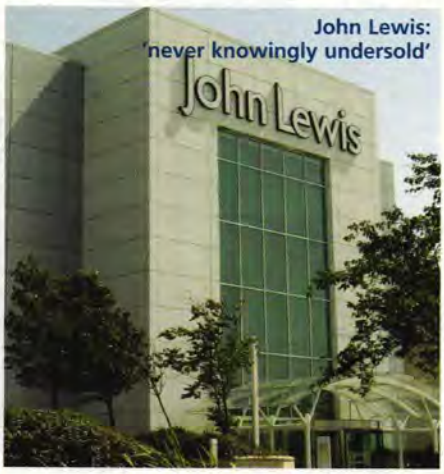
Analysts from McKinnon & Clarke identified that there were discrepancies in the application of charges relating to MCA's water use. By liaising with MCA's supplier, the company ensured that the charges were amended and refunded on a retrospective basis. As a result, MCA received refund cheques totalling £46,000 in addition to an ongoing saving of 27% per annum on its total water spend.

Gavin Redmore, Senior Water Engineer for McKinnon & Clarke, adds: "Issuing refund cheques to our clients is always good news, in MCA's case we are also delighted that the ongoing savings we are achieving on their behalf are so sizable. We find that many companies believe that the limitations of the water market reduce their savings opportunities. As our work with MCA demonstrates, our years of experience give us the necessary knowledge to negotiate charging arrangements to the benefit of our clients".

www.mckinnon-clarke.com

John Lewis, Waitrose choose Corona Energy for gas

London-based natural gas supplier Corona Energy Ltd is the new provider of natural gas to John Lewis and Waitrose stores nationwide. The contract, which is likely to be worth in excess of £5 million, came into effect in January this year. Corona Energy is now supplying gas to 26 John Lewis department stores and 166 Waitrose supermarkets around the country as well as the offices and distribution facilities of both companies.



John Lewis: 'never knowingly undersold'

The decision to change to Corona Energy on a long-term agreement was the culmination of a meticulous selection process involving Utilyx and energy managers from both John Lewis and Waitrose. A flexible strategy was agreed between the John Lewis Partnership and Corona Energy whereby gas is procured on a monthly basis, allowing the retailer to benefit from fluctuating gas market prices.

"Procurement flexibility was a very important factor for us," explained Bill Wright, Energy and Environment Manager for John Lewis. "We no longer have to commit in advance on an annual basis. We just keep an eye on the gas market and, working closely with Corona Energy and others, buy at the most advantageous time. We also liked Corona Energy's electronic billing facility which is highly efficient and their flexibility fits well with the way we like to work."

www.coronaenergy.co.uk

Reducing energy consumption in freezers and chillers

With energy costs continuing to rise, the cost of electricity consumed by refrigeration units is now a major consideration for food manufacturers and retailers. While new freezers and chillers are designed to be more energy efficient, there are still opportunities to reduce power consumption: particularly where existing installations are concerned.

One such solution, developed by UK manufacturer Savawatt, is already being used extensively by retailers including Iceland Frozen Foods and McDonalds. The problem with freezer cabinets and cold stores is that, for much of their operating life, the compressor used to drive the cooling system is working well at below its optimum performance. A novel control system, consisting of a self-contained device that can be easily retrofitted to existing cabinets forms the basis of SavaWatt's approach to energy reduction. By controlling the operation of the compressor motor, so that the power supplied is matched to the motor load, significant savings in electricity consumption can be achieved.

Dr Malcolm Addy, managing director of the Warwickshire based company, explains the concept of motor control on freezer compressors, "Motors driving compressors are only under full load at start up and for a short initial period. By monitoring and controlling the power requirement of a refrigeration motor, a SavaControl can be used to reduce the actual power requirement of a chiller or freezer cabinet."

The SavaControl works by modulating the apparent voltage supplied, thereby reducing power consumption. The modulation is achieved by switching the motor on and off a 100 times every second. In fact, energy savings of two kinds are achieved, by providing only enough power to drive the compressor motor at all stages of its operation. Firstly, the power is no longer wasted under part load. Secondly, the modulation reduces core and winding losses in the motor: further improving efficiency.

Assessing actual energy savings, particularly on refrigeration cabinets, can be difficult because of the variation in use of each freezer unit. However, by measuring the energy consumption on individual cabinets and the total load of all freezers, accurate comparisons can be achieved. Monitoring of this type was carried out by SavaWatt as part of a study undertaken on energy consumption at one of Iceland's retail stores. Savings of 15% in unit consumption were achieved, as well as further reductions in energy use, as a result of the decrease in maximum demand.

www.savawatt.com

Dalkia wins Southern Rail energy contract

Train operator New Southern Railway Ltd has awarded a new contract for energy management to Dalkia. The scope of the contract includes bill validation, meter reading and benchmarking across the whole of the Southern operation – targeting opportunities for significant savings in energy consumption whilst also ensuring that Southern gets best value from its utility providers.

Dalkia will be surveying key Southern locations with a view to confirming a strategy for energy savings across the entire Southern estate of 161 stations and offices, from Warblington in the west to Rye in the east and from London down to the south coast.

"We are hopeful that success with this contract will demonstrate the scale of savings which could be achieved across the entire UK rail network;" says Dalkia Energy Sales Manager Mike Sewell. "Something which potentially could reduce Southern energy costs by 12% – in context of double-digit percentage increases in energy tariffs, these savings become especially important," he adds.

www.dalkia.co.uk

New industrial revolution brings renewables support to the north-east

This year will see the opening-up of testing laboratories at the New and Renewable Energy Centre (NaREC) in Blyth in Northumberland. The new establishment represents a £10 million investment in new facilities to encourage innovation and support development of renewables, writes Andy Burn, *NaREC's Head of Communications.*

It has been described as 'a warehouse of possibilities' and, as warehouses go, this is a large one. NaREC has been created out of the need for massive investment into renewable technology and the desire to boost innovation. Each laboratory on the 60 hectare site is unique, each capable of supporting market developments.

The move from onshore to offshore wind farms and the related increase in turbine blade size is generating the need for longer blade tests. Tide and wave technology is still in its relative infancy, solar technology is undergoing a renaissance, and the electrical grid challenges necessary to make this possible are being overcome. NaREC is combining facilities and consultancy for each of these areas. As well as developing partnerships with universities and businesses, the test facility itself is developing a reputation as *the* centre for evaluation, testing and development across a broad mix of renewables.

The Blyth site was once a prominent shipyard in one of the biggest deep water harbours on the coast. During the last industrial revolution the area was the largest exporter of coal in the world. Now, NaREC's declared aim is to lead the world in renewable technology.

The blade test facility

Larger turbines mean longer blades. The blade test facility is based upon the existing hydraulically actuated testing rig developed by the US-based National Renewable Energy Laboratory (NREL). A dual axis test saves both energy costs and time. NaREC has transformed an existing harbour-side fabrication shed into a test facility to accommodate the next generation of blades, up to a length of 70 m.

This has meant a huge investment in, not least, concrete. Around 3000 m^3 of structural concrete was poured in. The twin hub superstructure incorporates two 35 tonne plate and tube assemblies to which the blade is bolted. And two hubs mean static and fatigue tests can be carried out to replicate the lifetime stress of a turbine blade. Seven electric winches facilitate the static test, each applying up to 400 kN and the fatigue test at 0.35–0.7 Hz using a 250 kN actuator. Construction of the facility is still underway. At present it is best known for draining the north's supply of available concrete. Blade testing for clients is scheduled to begin in September.

The marine test facility

It's a common misconception, much to do with the fact that Britain's first offshore wind farm (albeit only two turbines) was sited just a mile from the harbour. The presence of a further nine 300 kW turbines first sited, nine years ago, on the harbour wall led people to believe that wind made Blyth a natural choice for a renewable energy centre. However, the truth has everything to do with the existence of three dry docks; unused and available. This has meant that as far as prototype testing is concerned NaREC's marine technologists have had a head start. While other laboratories are still being fitted out the Marine team have been getting on with the job of testing.

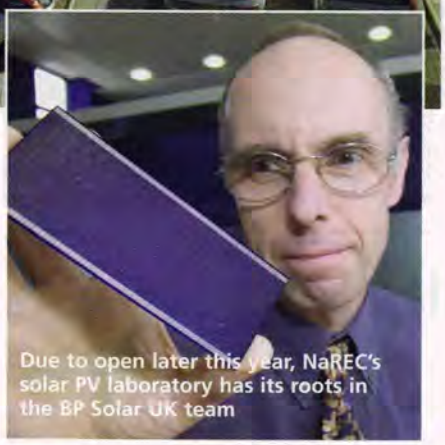
The main offices at NaREC back onto the wind farm located on the harbour wall

The largest of the docks is fitted out with a simulated sea bed and beach. It's currently used for pile tests and sea defences. The smallest hosts NaREC's wave dock and has been used to test prototype wave and tidal devices on a one-tenth scale. This wave facility is a flume of 56 m length, 5 m width and a maximum depth of 7.2 m. It is equipped with a gusseted wave-maker at one end which can be moved up and down on the wall to vary the water depth between 4.2 and 7.2 m.

The wave maker has eight paddles that can operate independently to generate short crested waves as well as long crested waves. It can operate over a period range from 1 to 8 seconds producing a maximum wave height of 1.2 m at 2.8 second period and waves above 1.0 m between the periods 2 to 3.5 seconds. The flume is also equipped with a simple beach which is effective enough to keep the reflections below 10% over the whole period range. Ocean Wave Energy Ltd has recently successfully completed a two month trial test of its prototype wave energy converter.

Since the flume is set in a wider dock, it is also possible to create steady flow within the flume to simulate tide together with the waves. To achieve this some of the panels from the side wall and the beach would have to be removed and thrusters with sufficient power would have to be installed within the flume. Such a test was performed for Soil Machine Dynamics and up to 1 m/s mean flow speed in 4.2 m water depth was achieved with a 200 kVA power pack.

The existence of the docks allows simulated testing in controlled salt water conditions.



Due to open later this year, NaREC's solar PV laboratory has its roots in the BP Solar UK team

The Charles Parsons Technology Centre

Named after the North East engineering pioneer and inventor of the steam turbine, this particular facility was purpose built from scratch and houses the EnergyLINK laboratory.

NaREC's EnergyLINK laboratory has been designed to tackle the main problems associated with increasing the level of distributed generation on the electricity networks. New distributed generation tends to be efficient CHP units, providing heat and electricity for customers; or renewable energy powered generators, principally from wind and land fill gas.

The EnergyLINK laboratory facilities target micro-generation, power take off optimisation and network evolution topics.

The principle barriers to micro-generation adoption are planning, grid stability and economic issues and, for micro-wind turbines, planning tends to be dominated by noise concerns. Grid stability has been protected by Engineering Recommendation G83/1. Economic issues are dominated by the cost and energy yield. Noise, G83/1 compatibility and performance characterisation, including energy yield and support structure loading, can all be measured and reported upon by the EnergyLINK laboratory. Further, design engineers in NaREC's team can suggest design improvements to reduce cost, and NaREC's consultants are working with local authorities and others to stimulate the market for such devices.

Power take off optimisation covers a range of problems from mechanical power capture, drive train analysis, generator selection, energy storage and conversion to grid code compliant electricity. NaREC's team has relevant experience in these areas and the facilities to emulate power sources (eg the wind) and experiment with the rest of the system to optimise system design.

Distribution networks are not generally designed for generator connection; rather, until recently, they passively transported energy to customers. Changing this network topology and control strategy requires new devices and new thinking, The EnergyLINK Laboratory has network emulation facilities to allow physical testing of devices to be undertaken prior to them be deployed on real networks where safety, cost and security of supply issues rightly dominate the risk approach taken by the owners

The PV laboratory

When BP Solar relocated its main solar cell manufacturing plant to new premises in Madrid it set up a new R&D arm. The BP Solar UK team then moved to NaREC.

The Photovoltaic Laboratory is due to open, alongside the other facilities, later this year. It comprises a small-scale process line and characterisation laboratory. The team and the laboratory represent the only facility of its type in the UK specialising in the silicon solar cell development and specialist cell manufacture. The team is also working in partnership with a number of organisations to develop the next generation of solar cells to be incorporated in building materials.

The NaREC Clothier Laboratory

This is the latest addition to the NaREC jigsaw of facilities. The Clothier Lab was acquired from the British Short Circuit Testing Station. It performs medium and high voltage testing of electrical equipment and can also simulate extreme conditions including wet weather and lightning strikes.

According to General Manager Paul Barnfather: "For any electricity system, safety and reliability are paramount. Failure of any part of the system is not only dangerous, but also can have catastrophic knock-on effects resulting in wide-area blackouts. At NaREC Clothier Laboratories, we're in the business of making sure this doesn't happen."

Here, we test and certify equipment destined for connection to the grid and make sure it's fit-for-purpose – whether it's a small module for a photovoltaic scheme, right up to the million-volt terminations used in the world's largest grid systems.

We do this by subjecting the equipment under test to extreme voltages: using alternating current (to confirm normal operation), direct current (to check for mobile particles and confirm long service life) and impulse (to check performance under lightning strike conditions). This way we ensure that the equipment won't fail in service.

Such testing techniques are already standard practice in the traditional electricity sector, where the cost of equipment failure is well known and understood. As we come to depend more and more on renewable energy, we're seeing the same concepts being applied to renewable energy sources. This is especially the case with wind turbines, which are increasingly deployed in remote, hostile, lightning-prone locations. The conditions are tough, and failures in service are not unheard of.

"No-one wants their electricity supply to be interrupted, so it's essential that renewable energy sources are at least as reliable as the technology they're replacing. Rigorous development, testing and certification are essential; and cost-effective provision of these services is exactly what NaREC is about," adds Barnfather.

Regional regeneration

In the days before NaREC came to Blyth, the old dry docks were used by Euroseas Engineering Solutions and Testing. The move of one of their personnel to the

Like something out of Dr Who – NaREC's Clothier laboratory can simulate lightning strikes onto electrical equipment

North of England's inward investment agency, ONE North East, provided the spark that led to NaREC.

The regeneration of the north east of England is the task for ONE North East: to replace the old redundant heavy industry with a new technology, with high quality jobs was the vision. £10 million of funding was made available to build the laboratories and test facilities needed to establish the new centre.

NaREC's Chairman is Professor Ian Fells and Chief Executive Doug Everard was recruited to oversee the establishment of the centre for encouraging ideas and innovation in renewable technology. The new centre will use the skills and expertise already present in the regions workforce, the old skills of shipbuilding, power generation and mining that were, in many cases, transferable to the needs of the new energy market.

Everard says: "NaREC has transformed the initial investment over the past eighteen months into a mix of world class laboratories and test facilities. Starting with just a handful of individuals we have grown into a company employing more than sixty staff made up of technologists, consultants, engineers, technicians and mechanics. We have been collaborating with universities and developing partnerships with industry. Our aim is to become financially self sufficient, to work as a not for profit company, to enable and encourage innovators in industry who want to take their renewable power generation ideas off the drawing board and into a working reality."

The building stage of NaREC is almost complete, next comes the transition stage when NaREC puts its vision to the test, when the laboratories start to operate. ●

Contact the New and Renewable Energy Centre Ltd (NaREC) at www.narec.co.uk

The existence of three unused dry docks at Blyth before NaREC was conceived has given the new organisation a head start

NaREC's wind turbine blade testing facility is scheduled to start testing 'in anger' in September

Blackpool's 'zero energy' exemplar and demonstration building

Blackpool on the Lancashire coast might not be the first place that you would look for a centre of environmental excellence but, says the Borough Council's Ross Fielding, *times are changing and so is Blackpool. Still the largest of the British seaside resorts, and arguably still the largest in Europe, the town has embarked on an ambitious master plan of regeneration in order to re-invent itself both as a 21st century destination for tourism and as a safe, prosperous, vibrant and sustainable place to live. One of the early success stories is the Solaris Centre for Environmental Action, Tourism Excellence and Business Enterprise, a £2 million project that is already fully operational.*

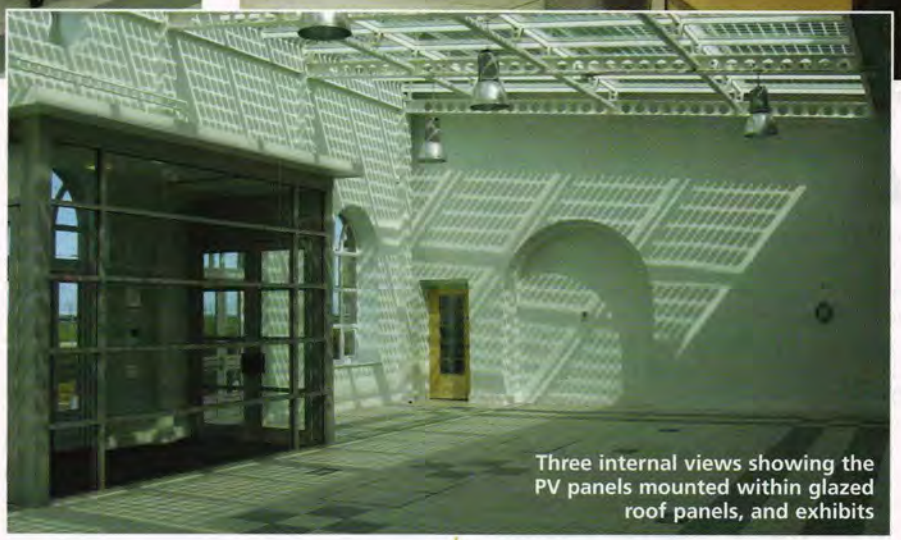
View of the central part of the sea-facing façade with two wind turbines

Developed by Blackpool Borough Council, the Solaris Centre was designed to provide a focus and a venue for the communication of the importance and benefits of everyone taking individual and collective responsibility for the future or our environment. The Centre uses interactive technology to show how we can all help to make a better environment for both this and future generations.

Within the Centre, a range of occupants perhaps as innovative as the building operate. Four small business starter units are already fully let and the building also houses:

- a range of seminar rooms with inclusive visual aids available for use by projects, partners and the community;
- an exhibition hall equipped to promote all the sustainable themes to visitors; and
- a cafe to not only induce visitors in to see the exhibitions but also to support the building uses with catering services.

And there is more, as Solaris is a base for training and environmental projects operated with partners Lancaster University,



Three internal views showing the PV panels mounted within glazed roof panels, and exhibits

Blackpool & the Fylde College and Blackpool Environmental Action Team. Four projects are already in operation.

Housed in a 1930s art deco building

Consistent with the sustainability theme, it was decided to house the project within the town's Harrowside Solarium. The Solarium is a 1938 art deco style building set in four acres of open space on the Blackpool Promenade. It was originally constructed with solid walls of bricks and artificial stone blocks, together with a glazed roof of fired glass set in metal glazing bars and a subterranean heating system of iron pipes below grids – in all hardly a formula for energy efficiency. Worse, the building was a sorrowful picture of decay, neglect and vandalism.

The building work comprised the restoration of the façade to re-establish its grandeur and strong architectural character, and the reconstruction and extension to the rear of the building. The original 670 m^2 of floor space has been extended to 1200 m^2, in a style that is sympathetic to the original design and orientated such that overall symmetry of the building is retained.

The design and build of the centre itself demonstrates the innovation and technology available in the generation of sustainable and environmentally sound construction, complemented by the re-use of materials from the original building and reclamation materials from other recycled sources. The building also incorporates grey water technology whereby rainwater from the roof passes through grit traps into underground storage, from where is pumped to supply toilets and urinals.

Net 'zero energy' building

But it is probably in the Energy context that Solaris is the greatest exemplar. The original brief called for a net zero energy building constructed to a BREEAM rating of 'excellent'. At the front of Solaris stand two Proven wind turbines each rated at 6 kW and estimated to produce 34,000 kWh per year. The turbines are 9 meters high with a rotor diameter of 5.5 m. Due to their design and construction, they are extremely quiet and are said to be capable of generating in winds up to 150 mph.

Incorporated into three large glazed roof areas are double glazed panels themselves incorporating photovoltaic cells capable of generating up to 18 kW of electricity. These semi translucent cells (28% transparency) are incorporated into the roof of the central sections and corridors of the building, the exhibition areas, as a demonstration of a clean source of electricity generation. The PV glazed laminate creates a very impressive visual experience from within the building. A conventional solar hot water panel is provided separately together with high levels of insulation, automatic lighting, open cable ducting to release emitted heat to rooms, reflective glass and a light tube.

A late inclusion into the project was a Dachs combined heat and power (CHP) unit provided and installed in partnership with Baxi. This is configured to provide the base heat load of the building, with the peak heating load supplemented by condensing boilers. It is important to emphasise that the building uses utility gas and electricity when necessary, balanced by the sale of surplus renewable generated electricity back to the grid. There is a display panel that indicates the total generation that has been achieved by the PV cells and wind turbines, and the amount of carbon dioxide saved. This will shortly be supplemented by computer displays showing all net energy flows, with data extracted from the Council's building management system.

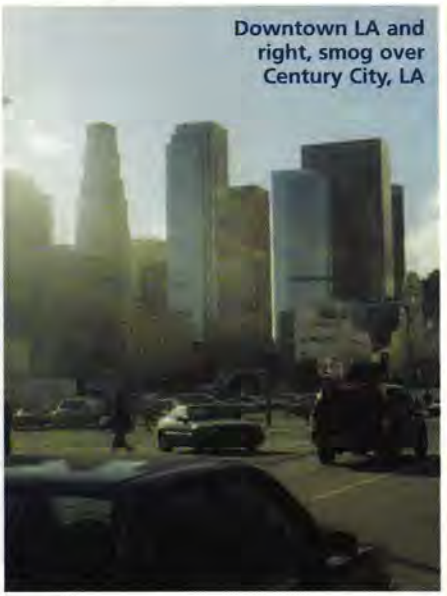
The building has been assessed by the BRE ENVEST environment assessment method to reaffirm its sustainable and low energy design. The building is also designed to the best practice energy performance yardsticks as set in *Good Practice Guide 286 – Energy Performance in the Government's Civil Estate and Energy Consumption Guide 19 – Energy use in offices*, as published by the Government's Energy Efficiency Best Practice programme.

Funding was provided from a package of sources including the Energy Saving Trust, New Opportunities Fund, North West Universities Association, North West Priority 1 Partnership, Lancashire Tourism Partnership, Single Regeneration Budget, SEED, Landfill Tax Credits. The main contractor was Walter Carefoot & Sons Construction Ltd.

Contact Ross Fielding at
ross.fielding@blackpool.gov.uk

ZeroCarbonCities – tackling climate change at a local level

National governments are not the only organisations able to set about tackling climate change, and neither is the USA completely ignoring the subject – as Andrew Cox *discovered on a trip to see action being carried out by three North American cities.*



Downtown LA and right, smog over Century City, LA

At the beginning of March this year the British Council launched the ZeroCarbonCities campaign. The principal aim of this £4 million global science initiative will centre on climate change and the challenges facing the world's greatest cities. It will stimulate greater public debate and awareness – with a variety of activities taking place in 100 cities in 60 countries – in a year when the UK will undertake the presidency of both the G8 and the European Council.

ZeroCarbonCities (www.britishcouncil.org/zerocarboncity) shifts the emphasis of attention towards mitigation, adaptation and practical measures that can be taken. In doing that, the campaign will raise international awareness of the UK as a country that has commitments to tackling climate change and seeks to promote answers as well as analysis.

The campaign is sponsoring a two-month online debate on climate change issues which will be held on www.opendemocracy.net. A summary document will bring together the key issues from the debate – and will be presented to the delegates at the G8 Summit in July 2005.

One recent element of the ZeroCarbonCities campaign was a series of events held at the end of March 2005 in three cities on the west coast of North America. Three UK speakers – Mark Goldthorpe (South East Climate Change Partnership), Steve Piltz (Sustain Consult) and Andrew Cox (CarbonNeutral Newcastle campaign) – joined local representatives in Vancouver, San Francisco and Los Angeles to exchange ideas concerning climate change mitigation.

The growing importance of cities

During the 21st century the impact of climate change on human society is set to increase. Currently, nearly 50% of the planet's population live in cities – but it is estimated that this figure will rise to 60% by 2020. Thus cities could take on a pivotal role in reducing and mediating the impacts of climate change.

Research in 2004 by the Tyndall Centre for Climate Change highlighted the role of cities – as over 75% of global energy consumption is directly related to their activities. For example, Greater London currently consumes more energy than the whole of Ireland and about the same as Greece or Portugal.

It is worth stressing that international links can be built between cities, even when nation states cannot agree. An important network is the Cities for Climate Protection (CCP) programme established in 1993 by the International Council for Local Environmental Initiatives, a membership organisation for local government authorities. The CCP provides a framework and support for emissions reductions.

In the UK, the Nottingham Declaration on Climate Change also outlines the key principles for local authorities.

The perception of most people in Europe is that North America, particularly the US, is a laggard in confronting the serious challenges posed by global warming and climate change. However, many of the major cities in Canada and the US (including Vancouver, Toronto, San Francisco, Los Angeles and Chicago) and 23 US states and several Canadian provincial authorities have been actively developing programmes to reduce greenhouse gas emissions – including trading initiatives, plus the promotion and commercialisation of new energy low-carbon technologies.

Vancouver, British Columbia

Vancouver is the largest city on the Canadian Pacific coast – probably best known for its scenic venues, wet weather and being the location where many episodes of the X-Files were filmed.

Future changes in sea level and climate could have adverse effects on the city and its inhabitants. With these issues in mind, the City Council's Cool Vancouver Task Force has produced a detailed community climate change strategy (CCCS) and community climate change action plan. These documents underline the view that the municipalities and cities of Canada are the key to the country successfully meeting its Kyoto Protocol emissions targets.

Vancouver's action plan establishes an emissions reduction target for Vancouver of 6% below 1990 levels (2.9 million tonnes) by 2012. Achieving this target will require a reduction in greenhouse gases of roughly 450,000 tonnes per year from projected 'business-as-usual' levels in 2012. This is viewed as only being the first step in addressing climate change and much deeper emissions reduction will be required in future decades.

Local authorities in the UK and other countries could find the structure and content of Vancouver CCCS particularly useful during the development of local climate change strategies and related policies.

The main energy utility in the province, BC Hydro, has become increasingly concerned about the impact of climate change on its operations. It is developing several programmes to reduce its own emissions and environmental footprint – including the introduction of further energy efficiency measures and developing strategies for the transition to the hydrogen economy.

The suburbs of Vancouver are also the home of several companies involved in developing fuel cell technologies, such as Ballard. Another key company is Azure Dynamics Corporation, which has links to several UK manufacturers of hybrid/electric vehicles, and is closely involved in formulating low-impact transport strategies for the 2010 Winter Olympics, which will be held in Whistler, British Columbia.

San Francisco, California

San Francisco is a diverse, cosmopolitan and vibrant city. In June it will be the host

city for the United Nations World Environment Day – including an international conference to which the mayors of the largest 250 cities in the world have been invited.

The City's Department of Environment have developed the Clean Energy, Clean Air Programme which supports the City's Electricity Resource Plan (ERP) – and the municipally-owned electricity and gas utility. The ERP calls for the municipal sector to contribute to city-wide demand reduction efforts to reduce local air pollution and greenhouse gas emissions, and to improve electricity reliability. The expansion of electricity generation from renewable sources is a key element of the ERP.

The Environment Department of San Francisco is also responsible for promoting energy efficiency in the private sector, working with residents, community organisations and businesses. Between 2002 and 2003 the Department carried out a lighting retrofit programme with more than 4,000 small businesses and small institutions, saving an estimated $3.5 million in energy bills and 9,600 tons of carbon dioxide emissions. It is also involved in a programme to reduce peak electricity and gas consumption. The programme includes direct retrofits, energy audits, equipment exchanges (including LED lighting), pilot projects with emerging technologies and the development of new local energy codes. Many elements of the programme will be familiar to energy efficiency officers in the UK and other countries.

Details of the developments in San Francisco are available on the web at www.sfenvironment.org and www.sfwater.org.

Los Angeles

Anyone who visits Los Angeles will be confronted by the high level of fossil fuel consumption in the city. It has a huge vehicle population and the high summer temperatures mean that air conditioning is virtually ubiquitous in commercial, municipal and domestic properties.

Los Angeles is extremely vulnerable to climate change. Impacts could include the flooding of low-lying property (as many communities are at or close to sea level), loss of beaches and coastal wetlands, damage due to storms and extreme weather conditions, saltwater contamination of drinking water supplies, and increases in heat-related illnesses.

This vulnerability to climate change was one reason why the City of Los Angeles decided in 1998 to develop its own Climate Action Plan (CAP) to reduce greenhouse gases from its municipal operations. Over the past decade the City has maintained its level of municipal emissions at a stable level despite an almost 7% increase in population. The City plans to reduce its emissions to 70% of 1990 levels by the year 2010 and is currently on target to do so.

Key elements of the Los Angeles CAP are:

- an energy programme to use cleaner fuels in local power plants, and to promote increased usage of non-polluting renewable energy resources;
- energy efficiency programmes to retrofit approximately 600 City facilities to reduce energy consumption, and to complete the conversion of the City's nearly 250,000 streetlights and traffic signals to more efficient lighting technologies that require significantly less electricity (including LED systems);
- recycling programmes to divert or recycle nearly 60% of the City's waste stream, thereby saving energy in product manufacture and reducing the generation of methane from landfill sites;
- transportation programmes to deploy more than 6,700 clean alternative fuel and electric vehicles and associated infrastructure, to provide public transit alternatives, new technology to improve traffic flows, plus travel plans and vehicle-sharing incentives; and
- tree planting programmes will also help to offset carbon dioxide production, lower energy use by providing shade for buildings, and cool ambient air temperatures within the City.

It is worth stressing that the City Council owns a large number of public buildings, plus the municipal power and water system, Los Angeles Airport and the Port of Los Angeles. Programmes to stabilise and reduce emissions from its varied activities and property portfolio can therefore have a significant effect on the overall level of emissions within the City – as well as influencing other the sectors of the local economy.

Climate change mitigation measures in southern California are not restricted to the City of Los Angeles; other local authorities are developing energy efficiency and emission reduction programmes. Neighbouring San Diego is aiming to reduce carbon dioxide emissions across the city to 15% below 1990 levels by 2010.

California state-wide initiatives

The State of California is also introducing a range of initiatives to improve energy efficiency and reduce greenhouse gas emissions.

California, with a population set to reach 40 million by 2010, has the fifth largest economy in the world. Its prosperity and quality of life are increasingly reliant upon dependable, high quality, and reasonably priced energy. Recent experience has shown that California can be extremely vulnerable to disruptions in energy supply. Despite the winter period of 2004/05 being one of the wettest on record in the state, California is still recovering from several years of drought which left reservoir levels at historically low levels. This is a serious issue for a state that relies on hydro-electric power for a significant proportion of its electricity supplies.

In 2003 California's Energy Commission developed an energy action plan. Key elements of this adopted plan are:

- the introduction of widespread energy conservation and efficiency measures;
- an acceleration of the introduction of renewable generation (with a goal of 20% of electricity being supplied from renewable sources by 2010);
- upgrades to the transmission system and the construction of 2000 MW of new generation capacity (particularly to meet peak capacity);
- the expansion of distributed generation capacity in the state; and
- measures to ensure the reliable supply and affordable pricing of natural gas to local energy markets.

Since his election, Governor Schwarzenegger has also proposed further measures to strengthen security of energy supply – including an ambitious programme to add photovoltaic systems to the roofs of one million properties in the state by 2020. Other initiatives in southern California include assistance to the private sector to introduce low- and zero-emission vehicles (see **www.aqmd.gov**) and a 'hydrogen highway' – which will have a series of specialist filling stations for the growing number of hydrogen-fuelled vehicles.

Building connections

They say that travel can broaden the mind. It can also reveal that other countries, and particularly their cities, have many excellent examples of new technologies and best practice that can be adopted in the UK, Europe and other regions of the world.

Developing and maintaining a global dialogue between politicians, policy-makers, community groups, scientists, engineers and entrepreneurs is essential if the world's cities are to adopt the appropriate strategies to combat the causes of climate change. Programmes such as ZeroCarbonCities are an important step in this process. ●

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Renewable energy as development tool

Eight Millennium Development Goals were launched through the United Nations Millennium Declaration in 2000. The second and seventh goals set targets for 2015 of ensuring that all children complete a full course of primary education and of halving the number of people who are unable to reach or to afford safe drinking water. Here, UK-based IT Power *outlines how some its renewable energy projects have contributed to both of these goals and how PV and other renewable energy technologies can support all the goals.*

One of the 1,000 schools in rural South Africa equipped with a PV electricity generation system

PV power in schools promotes education

IT Power provided extensive technical assistance to a European Commission-funded project to provide PV electricity to 1,000 schools in remote areas of Northern Province and Eastern Cape Province in the Republic of South Africa (880 kWp in total). As well as providing electricity for lighting for up to five classrooms in each school, the PV systems also provide power for audio-visual teaching aids. The project also trained emerging contractors to install the equipment, as well as school staff to maintain the systems.

A number of activities to ensure the longer-term sustainability of the programme were carried out by the Technical Assistance Unit (TAU), established by IT Power, and steps to initiate and develop an ongoing maintenance programme within the Department of Education were undertaken. Additional training was provided for extension workers, who in turn were then able to train the teachers at the schools. A comprehensive user manual was written, and a video explaining the essentials of user operation and maintenance was filmed. The TAU was also instrumental in the development of an information management system, which then formed a tool for the management of the installation programme and later for maintenance.

This project is an excellent example of using renewable energy technologies to improve education in developing countries and work towards eradicating poverty in the longer term.

One of the Millennium Development Goals is to ensure that, by 2015, children everywhere will be able to complete a full course of primary schooling. Renewable energy technologies can be used to help meet this goal as provision of electricity enables access to educational media and communications and energy helps create a more child-friendly environment and reduces drop-out rates. Lighting in schools also allows evening classes and helps retain teachers.

PV water pumping promotes agriculture

Twenty five years ago the World Bank and United Nations Development Programme (UNDP) launched the Global Solar Pumping Programme. IT Power, with Halcrow, were selected as consultants to undertake the programme which installed solar pumps in Mali, Egypt, Philippines and Sudan. At that time the technology was just emerging and the project set high professional standards to become a benchmark in technical testing, performance monitoring and economic analyses. When the work was completed 20 years ago, it made ambitious recommendations for work leading to the large-scale introduction of PV pumps in several countries in Africa, Asia and Latin America.

Over the last two decades, research and development has contributed to the production of today's highly efficient and reliable PV pumping systems. There are some outstanding success stories with PV pumping providing clean drinking water and water for irrigation and today there are around 20,000 PV pumps installed throughout the world.

The European Union's Water Initiative was launched in 2004. This has a budget of €500 million available for investments through the European Development Fund which address the water-related targets of the MDGs in the Africa, Caribbean and Pacific countries. The European PV community should see this as an exciting opportunity to get PV Water Services on the investment agenda. ●

PV for water pumping can deliver clean water and work as a component of sustainable agricultural business – this example is in Mali

Meeting Millennium Development Goals

Some of the roles for PV and other renewable energy technologies in support of the MDGs include:

- *Eradicate extreme poverty and hunger* – quality lighting supports income generation activities and reliable electricity encourages enterprise development; modern energy can improve access to water supplies for cooking and drinking and for irrigation to increase food production.
- *Achieve universal primary education* – electricity enables access to educational media and communications, electricity helps create a more child-friendly environment and reduces school drop-out rates and lighting in schools allows evening classes and helps retain teachers.
- *Promote gender equality and empower women* – availability of modern energy means women need spend less time foraging for water and firewood; good quality lighting permits home study and reliable energy services offer scope for women's enterprises to develop.
- *Reduce child mortality* – electricity reduces indoor air pollution, increases safety, frees up more time to be spent on child care and facilitates pumped water and purification.
- *Improve maternal health* – energy services provide access to better medical facilities (vaccine refrigeration, equipment sterilisation, operating theatres); cooked food contributes to better health.
- *Combat HIV/AIDS, malaria and other diseases* – energy services support the use of better medical facilities and helps maintain the cold-chain essential for vaccine storage.
- *Ensure environmental sustainability* – traditional fuel use contributes to erosion, reduced soil fertility and desertification; electricity can be used to pump and purify contaminated water.
- *Develop a global partnership for development* – electricity supply can contribute to the development of information and communication technologies in remote rural areas.

Sir John Collins looks to the future as the next EI President

Sir John Collins, *the President-Elect of the Energy Institute (EI), was recently interviewed by* Chris Skrebowski, *Editor of* Petroleum Review, *at Dixons' headquarters in London. Sir John's latest position as Chairman of Dixons Group is the most recent in his glittering business career.*

Sir John started by noting that business had not been his chosen career. He had been studying agriculture at Reading University, confidently expecting to inherit and run his father's large farm in what was then Rhodesia, now Zimbabwe. However, any plans he might have had were dramatically overturned in his final year by a letter from his father – informing him that the farm had been sold, his father was going to live in Fiji, his university fees had been paid and enclosed was £50.

Confronted with this dramatic sink or swim challenge, the young John Collins then did the 'milk round' of Shell, Unilever, ICI etc that was the standard recruitment practise of the time – he chose to be recruited by Shell. This was to be the start of a 29-year career with the company, which he modestly describes as 'exciting and diverse'.

Shell career

Given his farming background, it was unsurprising that Sir John started in agrochemicals before moving into petrochemicals and, finally, into oil. In the course of his career with Shell, he worked in the UK, Kenya, Nigeria and Colombia. When asked which country he had enjoyed working in most, he unhesitatingly picked Kenya. With a twinkle in his eye, he agreed that at least part of the reason was that he had played both rugby and cricket for East Africa, which he had hugely enjoyed and which had stood him in good stead in the company.

Sir John's career in Shell culminated in his appointment as Chairman and Chief Executive of Shell UK in 1990. As Shell was a highly decentralised set of baronies and Shell UK was the second largest subsidiary, he had, in effect, become the second biggest baron in the group. Now equipped with the power, authority and responsibility for a £6 billion/year company, Sir John explained that he had initially seen his role as 'sharpening the marketing'. However, these plans and ideas were rapidly overtaken by the first Gulf War and the collapse of production at the Brent oil field, caused by lack of maintenance.

A 'brownfields' task force was then formed to tackle the production problems. This drew on expertise throughout Shell and was led by Chris Fay, who headed up Shell Expro. Sir John's summary of what was clearly a difficult and challenging time was that he had been 'set to do one job and ended up doing another'. However, he felt that the way things were tackled and the objectives achieved showed Shell at its best.

Head-hunted

Challenged as to why he left Shell in 1993, Sir John explained that he had been head-hunted to run the Vestey group, which had run into difficulties and needed to be turned around. One inducement to take on this very challenging job was a profit share for success. He also noted that it always makes good sense 'to leave while the party is still good'. The move to Vestey, at one level, took Sir John back to agriculture, with the company owning and running vast areas of land, particularly in Latin America, as well as having major shipping interests in its worldwide business.

Sir John confirms that he did turn the business around, earned his profits share and stopped, as planned, at 60.

However, any thoughts of retirement, or even a slower pace of work, were quickly dispelled when he was head-hunted to be Chairman of Dixons – to take over from the legendary Sir Stanley Kalms. In fact, Sir John did one year as Deputy Chairman before taking over as Chairman in 2002.

Questioned as to how he handled the relationship with Lord Kalms after taking over from him, Sir John explained that he took two pieces of paper and wrote down the role to be played by each of them. He says that by defining and agreeing clear lines, they established a harmonious working relationship that played to both their strengths.

Sir John then went on to explain that his role in the City, as a board member of Rothschilds, had taught him the importance of informing shareholders and keeping them onside. He says that he finds talking to analysts and shareholders exciting, particularly as investors have become more proactive.

Sir John becomes quite animated when talking about relationships with shareholders, stressing the importance of clarity of purpose if you wish to be supported. Gaining support and buy-in by employees, suppliers and financial backers appears to be the hallmark of Sir John's approach, with clarity and delivery being the other factors in a highly successful equation.

Energy policies

Sir John explained that he was fascinated by energy and its importance within our societies, which was why he had been happy to accept the Chairmanship of the DTI/Defra Sustainable Energy Policy Advisory Board. Sir John commented that he had been closely involved in developing the Energy White Paper and had been on the Prime Minister's Energy Committee. The challenge had been in balancing the traditional energy policy requirements of security of supply and fuel diversity with the need to have a policy that delivered on emissions targets to ensure that threats from climate change were minimised.

One strand of the policy was the increasing use of gas and, with North Sea supplies now declining, this necessarily implies increasing imports. Sir John noted that supply security can be addressed by using multiple suppliers, but this meant large-scale infrastructure investment, particularly if gas was imported as LNG. He was pleased to report good collaboration between industry and government, which meant there were already firm plans to import the required volumes via pipeline and as LNG. He went on to explain that, with the dominant position of state-owned or partially state-owned companies (Saudi Aramco, Gazprom etc), government involvement with Russia and Opec necessarily involved a wide range of government departments, including the Foreign Office, in the implementation of energy policies.

Renewables and nuclear debate

Turning to renewables, Sir John noted that this was one of the most debateable parts of the policy. Wind power was currently facing challenges in terms of making itself acceptable to society, particularly in terms of the aesthetics in areas of outstanding natural beauty.

The response of the wind industry had been good in terms of its preparedness to invest. However, the problems of intermittency meant that the 'jury was still out' on the scale of the stand-by capacity required and how these costs were to be borne. Social acceptability was another challenge and the target of 20% of renewable (emissions-free) power by 2020 looked highly problematic without a role for nuclear power.

Sir John's view was that once the election was over, nuclear power would be back on the agenda. He noted, however, that there were a number of challenges to be overcome. The first was the safe and effective disposal of spent fuel. He stated that he had been somewhat disappointed by the lack of innovative solutions to this problem and hoped people would be more imaginative in the future.

The second challenge was to find investors in the new capacity. This would also require imaginative solutions.

Thirdly, society had to be convinced that nuclear could be a safe and effective power provider.

Sir John explained that providing a suitable financial framework was not impossible. Offtake contracts – successfully used in the LNG industry, which also has multi-billion dollar investment requirements – are a real possibility. This, however, would require electricity trading arrangements to be reworked and recast. In terms of securing public acceptance, he felt that we, as a society, needed to be much clearer on the benefits, but accepted that extended consultations would be needed to build broadly based acceptance. Sir John also felt that we could learn from the Finnish experience, where extended consultations with all interested parties had secured acceptance for the building of their fifth nuclear power station.

In terms of overall energy supplies, Sir John felt that the UK was well served by a number of good companies in the oil, gas and electricity sectors. This enabled the UK to 'play the game on international terms', to the considerable benefit of the country. There was, he noted, a fascinating trend, particularly in the oil and gas sectors, for producing country companies to become more powerful, leading to an accompanying loss of power by the international companies. The result of this was that it was very important for the UK that the government had good relations with producing countries, in order to negotiate production contracts.

National companies such as Gazprom had much to offer in terms of security of supply for the UK. Sir John felt, however, that negotiating major long-term contracts would need to involve key government departments such as the DTI and the Foreign Office. In an important sense, the stakes are rising as fewer countries control incremental supplies. This, Sir John explained, means that energy and energy supply will remain very high profile and, in this context, the Energy Institute is set to become an important voice. The Energy Institute is in a position to facilitate debate, which will lead to recommendations for action.

Sir John felt that there was a need for fiscal encouragement to stretch out North Sea supplies but, in terms of negotiating with new suppliers the country was a potential winner as it was 'well equipped to play that game'. This would enable it to cooperate with others from a position of strength.

EI – right place, right time

Sir John explained that he felt very strongly that the Energy Institute (EI) was the right organisation at the right time. It was in tune with the real issues of today. The merger had been sensible as it had produced one real professional body for those in the energy industries. He felt he was privileged to be President (Elect) as the EI was very much in tune with the real issues. He explained that he had been impressed by what he had seen, and felt that the EI had a real cutting edge and a refreshing approach, which was good for a professional body.

Sir John also noted that the key to success was satisfying the membership and that the challenge was establishing what the members wanted and constantly checking that the Institute was meeting members' requirements. It was also important to be aware of, and deal with, any shortcomings. It was particularly important that the EI remained a respected voice and one contributing to the national debate. However, the EI should not lobby, its views should be clear, but it should avoid speaking for pressure groups. It should command respect and be seen as 'a voice that matters', said Sir John.

Asked how far the EI should go in developing an international role, Sir John's view was that one should 'see how far the carpet unrolls' – in other words, go with it, but don't push it. With existing branches in the US, South Africa and the Far East, there was a good base on which to build.

Sir John felt that the EI is, and should be, an excellent vehicle for 'networking'. Not just in terms of meeting and interacting

Sir John Collins

Sir John is currently Chairman of Dixons Group and a non-Executive Director of N M Rothschild & Sons and P&O. He is Chairman of the DTI/Defra Sustainable Energy Policy Advisory Board, President-Elect of the Energy Institute and a Companion of the Chartered Management Institute.

In 1964, having graduated from Reading University with a BSc in Agriculture, he joined Shell and held various positions in Kenya, Nigeria, Colombia and the UK, culminating as Chairman and Chief Executive of Shell UK from 1990–1993.

From 1993 until the end of December 2001, he was Group Chief Executive of the Vestey Group of companies. He joined the Board of National Power as a non-Executive Director in October 1996 and was Chairman from January 1998 until October 2000 when the company demerged. He was a non-Executive Director of British Sky Broadcasting from November 1994 until November 1997, Stoll Moss Theatres from 1999 to 2000 and Chairman of Cantab Pharmaceuticals from 1996 to 1999.

From April 1991 until August 1993, Sir John acted as Chairman of the Advisory Committee on Business and the Environment and, in May 1993 was knighted for his services to government and industry.

Sir John has served as a Director for the London Symphony Orchestra and Chaired a campaign to raise funds for Action on Addiction. He has also assisted with fund raising for various other charities, including the Jubilee Sailing Trust and the Ocean Youth Trust.

He is married, with two children.

with people, but also in terms of accessing the skills of the membership within an organisation whose pedigree would be endorsed by the government. The EI had a role to guide and support the execution of policy and to be its ambassador.

Asked if he thought the EI should be rounded out to cover all the major energy sources, Sir John agreed that over time coal and nuclear should be added. This would then mean that the EI could become the umbrella professional body for all aspects of energy supply.

Asked about his leisure activities, Sir John explained that he was not a workaholic and did not believe in working long hours, which gave him time to spend with his family and to pursue his interests in sailing (there is a large picture of his boat on his office wall) and his sporting interests – tennis, golf and horse riding. With mounting enthusiasm, he explained that he loves going to Africa, where he has conservation interests.

Without any embarrassment, Sir John explained that he enjoyed his leisure time and his life, which he said had 'been kind' to him. He felt that many business people relish pressure and end up working too hard and interfering too much. His view was that for business leaders it was 'the quality of decisions that matters' and excessive hours rarely made for good decisions. He enjoyed his success and recognised that he had a privileged position. He explained there were, of course, some bits that you don't enjoy – rationalising costs and firing people being just one example – adding rather tartly, 'anyone who enjoys firing people needs to see a doctor'.

Sir John Collins is, by anyone's standards, a charming and clear-sighted business leader who obviously enjoys nearly everything he does. His success is in no small measure the result of a clarity of purpose and a deep understanding of what motivates people. It would appear that the EI is very fortunate to have him as its next President. ●

EI Breakfast Briefing

energy INSTITUTE

'Eradicating Fuel Poverty – real progress or a mathematical conjuring trick?'

Wednesday 6 July 2005, Energy Institute

Jacky Pett, Head of Research at the Association of the Conservation of Energy and a member of the Energy Efficiency Partnership for Homes Fuel Poverty Group

The UK Government's Fuel Poverty Strategy sets out the statutory target: to eradicate fuel poverty amongst vulnerable people by 2010 and amongst all sectors by 2016, so far as possible. The review last year showed a considerable fall in the numbers of people in fuel poverty.

- What were the main reasons for this reduction?
- How does the calculation methodology affect the numbers reported?
- How many people 'dip in and out' depending solely on fuel prices?
- Could fuel poverty simply be defined out of existence?

Venue: Energy Institute, 61 New Cavendish Street, London WIG 7AR
Time: 07.30: Registration and breakfast
08.00: Speech
Price: Members: £15.00 (£17.63 inc VAT) Non-members £20.00 (£23.50 inc VAT)

To book tickets, please complete the booking form and return it to the Energy Institute, 61 New Cavendish Street, London, W1G 7AR or f: +44 (0) 20 7580 2230 together with payment in full. Please note that no invoices will be issued.

For more information please contact: Arabella Dick t: +44 (0)20 7467 7106 f: +44 (0)20 7580 2230 e: arabella@energyinst.org.uk www.energyinst.org.uk

The Cadman Lecture

energy INSTITUTE

Continuing the Oil and Gas Adventure

Thursday 23 June 2005

Old Hall and Crypt, The Honourable Society of Lincoln's Inn, Holborn, London, WC2A 3TL

Presented to: *Michel Contie,* Managing Director, Total E&P UK

Michel Contie, Managing Director of Total E&P UK, is the recipient of this year's Cadman Award, presented by the Energy Institute. This is one of the EI's most prestigious awards, commemorating the late Lord Cadman of Silverdale, Chairman of the Anglo-Iranian Oil Company (now BP) and past-President of the Energy Institute (formerly known as the Institute of Petroleum).

Mr Contie receives the award for his outstanding services to the petroleum industry and will receive the Cadman Award and present a lecture at an evening event on Thursday 23rd June in London. Mr Michel Contie began his career as an R&D engineer, first in France and later in the US, involved in development of new technologies for deep offshore oil developments. Within Total Mr Contie has held operational and managerial positions both in Paris and various locations around the world. In 1999 he became Senior Vice-President of E&P in Latin America, covering operations and new developments in the region. In 2000 he took up the post of Managing Director of TotalFinaElf Exploration UK during the merger of TotalFina and Elf, the company having latterly been renamed Total E&P UK.

The lecture will take place on Thursday 23 June at the Old Hall and Crypt, The Honourable Society of Lincoln's Inn, Holborn, London, WC2A 3TL from 17.45.

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Admission, which is complimentary, is strictly by ticket only, available from Jacqueline Warner, Energy Institute, 61 New Cavendish Street, London W1G 7AR t: +44 (0)20 7467 7116 f: +44 (0)20 7580 2230 e: jwarner@energyinst.org.uk
Tickets will be available on a first-come first-served basis.

Situations vacant

Energy Manager Required

Up to circa £40,000 p.a. salary depending on seniority, plus fully expensed company car, plus pension option. Technical competence in energy matters relating to building systems required. Duties will be varied. Excellent interpersonal skills are essential. Based South East England.

CVs to & further information from – Steve Howe. Email : line7@energy121.com [Agency.]

HEATING DEGREE DAYS

to 15.5°C base temperature

	Region	Feb 2005	Mar 2005	Apr 2005
1	Thames Valley	291	232	159
2	South East England	325	262	184
3	South Coast	297	249	180
4	South West England	272	236	183
5	Severn Valley	296	247	175
6	Midlands	318	262	201
7	West Pennines	312	257	219
8	North West England	306	260	223
9	Borders	293	274	235
10	North East England	306	265	223
11	East Pennines	315	259	203
12	East Anglia	334	280	189
13	West Scotland	310	266	232
14	East Scotland	310	274	232
15	North East Scotland	315	240	243
16	Wales	291	292	203
17	Northern Ireland	301	248	224
18	North West Scotland	306	276	238

For earlier data see **http://vesma.com/ddd/history.htm**

EI Summer Luncheon

Tuesday 12 July 2005, Royal Automobile Club, London
Drinks reception: 12.15, Lunch: 13.00

Guest of Honour and Speaker
***Sir David King*, Chief Scientific Adviser to HM Government and Head of the Office of Science and Technology**

Price: Members – £80.00 (+ VAT £94.00)
Non-members – £90.00 (+ VAT £105.75)

The EI Summer Luncheon is now an established date in the Energy Institute's calendar of events.

This event has been designed to provide guests with a fantastic opportunity to network with colleagues drawn from across the UK's energy spectrum.

In addition, the Summer Luncheon has developed a reputation for attracting leading industry figures to provide their analysis and commentary on current market conditions and the 2005 Luncheon is no exception!

To apply for tickets, please complete this form in BLOCK CAPITALS and return it to the address below, together with payment in full.
Arabella Dick, Energy Institute, 61 New Cavendish Street, London W1G 7AR, UK.
t: + 44 (0) 20 7467 7106, f: + 44 (0) 20 7580 2230, e: arabella@energyinst.org.uk

Title : Forename(s): Surname:

Company/Organisation:

Mailing Address:

Postcode:

Country: e:

t: f:

☐ I wish to order MEMBER rate ticket(s) @ £80.00 each (+ VAT £94.00)
EI Membership No:

☐ I wish to order NON-MEMBER rate ticket(s) @ £90.00 each (+ VAT £105.75)

☐ I wish to become an EI member at a cost of £74.00 (included/VAT zero-rated), therefore I am only paying the MEMBER rate Total inc VAT

I will pay the total amount by (please tick appropriate box):

☐ Sterling Cheque or Draft drawn on a bank in the UK
I enclose my remittance, made payable to Energy Institute, for £

☐ Credit Card (Visa, Mastercard, Eurocard, Diners Club, Amex ONLY)

☐ Visa ☐ Mastercard ☐ Eurocard ☐ Diners Club ☐ Amex

Please note that all payments made by credit card will be subject to the following surcharge:
Visa/Mastercard/Eurocard/Diners Club: 2% of the total amount due. American Express: 3% of the total amount due.

Card No:

Valid From: Expiry:

Credit card holder's name and address:

Signature: Date:

Photocopies of this form *are* acceptable

For more information and table bookings please contact:
Arabella Dick,
Energy Institute,
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TERMS AND CONDITIONS

When completing and sending the booking form, the purchaser is liable for full payment of the event fee. Full payment must be received before place(s) can be guaranteed. Under UK Excise Regulations delegates from all countries are required to pay VAT on any event taking place in the UK. The Energy Institute. A Charitable Company limited by guarantee. Registered in England No. 135273 at 61 New Cavendish Street, London W1G 7AR, UK.

Ticket price includes pre-luncheon drinks, and a 3- course lunch with wine. Cigars and liqueurs are not included.

In the event of cancellation of attendance by ticket purchaser a refund, less 20% administration charge of the total monies due, will be made provided that notice of cancellation is received in writing on or before 13 June 2005. No refunds will be paid, or invoices cancelled after this date.

DATA PROTECTION ACT

The EI will hold your personal data on its computer database. This information may be accessed, retrieved and used by the EI and its associates for normal administrative purposes. If you are based outside the European Economic Area (the 'EEA'), information about you may be transferred outside the EEA. The EI may also periodically send you information on membership, training courses, events, conferences and publications in which you may be interested. If you do not wish to receive such information, please tick this box ☐

The EI would also like to share your personal information with carefully selected third parties in order to provide you with information on other events and benefits that may be of interest to you. Your data may be managed by a third party in the capacity of a list processor only and the data owner will at all times be the EI. If you are happy for your details to be used in this way, please tick this box ☐