THE MAGAZINE OF THE INSTITUTE OF ENERGY

energy world

the institute of energy

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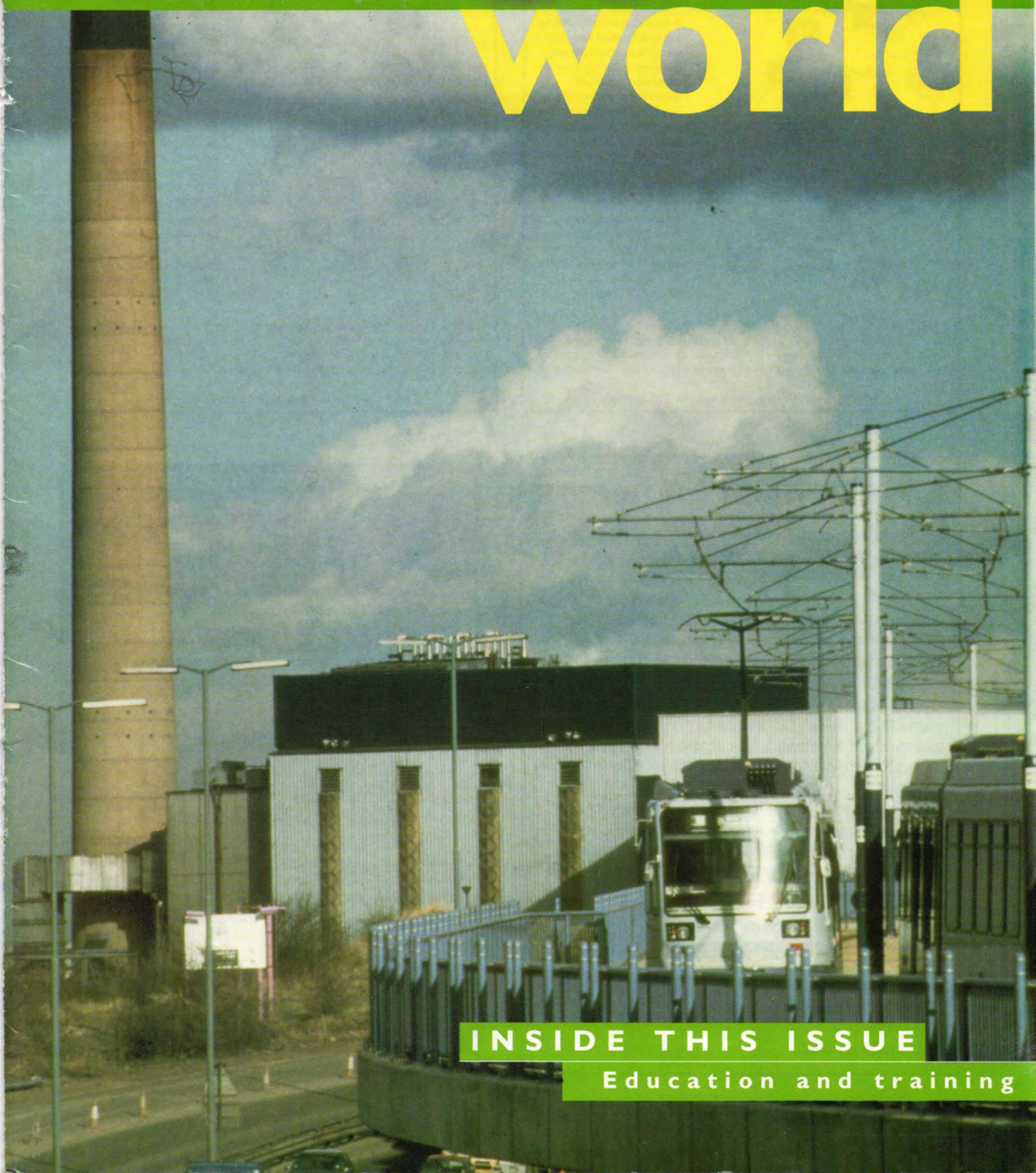

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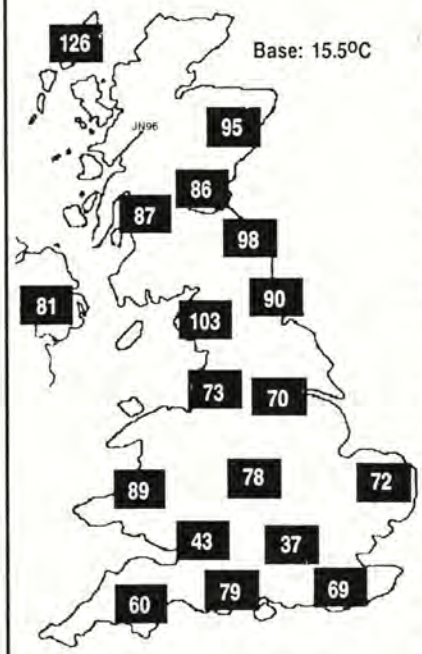
Education and training

DEGREE DAYS: JUNE 1996

Source: **Degree days direct**



These regional figures, calculated from daily outside air temperatures, provide an index of demand for space heating over the month and thus enable excessive consumption to be detected.

A well-controlled heating system should manifest a straight line relationship between monthly fuel used and the local degree-day value; any significant deviation from this 'target characteristic' is likely to signal the onset of avoidable waste (such as a stopped timeswitch or an open isolating valve).

Readers can get more information on the use of degree days from Vilnis Vesma, 17 Church Street, Newent, Glos GL18 1PU (01531 821350)

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http://ourworld.compuserve.com/homepages/vv/

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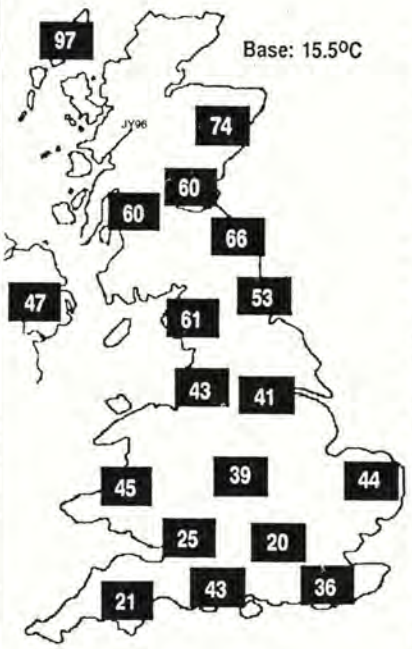

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COVER

Sheffield Heat & Power's Bernard Road incinerator, with one of the City's new Supertrams in the foreground. SHP distributes heat recovered from its municipal incinerator to homes, and public and commercial buildings in the City. The company is currently managing a £10 million programme of improvements to the incinerator, and plans to add a steam turbine to generate electricity under a NFFO 3 contract. See full story on page 24.

Speaking up for consumers

When the Government decided to privatise energy ten years ago, it never occurred to them that the consumer's voice would be critical for a successful outcome. All that was necessary, they decided, was to appoint a Regulator. He or she would keep the suppliers in check and ensure fair play for customers.

That was flawed thinking. A Regulator is primarily a judge. He usually makes his decisions after the problems have arisen but the consumers' opinions are needed in advance as an early warning of what is going wrong. Also, when judgements are made, the consumer needs to be present in the Regulator's court to ensure that balanced arguments are put forward.

Before privatisation, the case for the very large energy consuming companies was eloquently put by the Energy Intensive Users Group, the Chemical Industries Association and other bodies - who are still active and now even more eloquent.

There was, however, no organisation which could adequately represent the whole public and private sector of British business. It was the former Coal Board Chairman Lord Ezra who identified the problem and prescribed the solution.

Speaking at a meeting of the Ten Million Club, an organisation which I had set up to promote best practice in energy efficiency, he said: "Gas has now been privatised and electricity, water and coal will all go the same way in due course. Business consumers need a forum where they can compare notes on what the suppliers are doing, what the Government is thinking, how they can achieve the best prices and how they can influence the decision-makers".

Three weeks later I disbanded the Ten Million Club, established the Major Energy Users' Council with Lord Ezra as its first President and set about the tough task of building Europe's foremost energy network and lobby.

Our arrival was not greeted with open arms by all the suppliers, some of whom even now regard us as a whinge fringe. Those who assist us and work with us, however, regard the improved customer relations which result as essential to their success.

The first Gas Regulator (now Sir) James McKinnon was invariably prompt, polite and forthright in his dealings with us and proved a valuable ally in the battle for lower prices and more user-friendly contracts. The second Gas Regulator, Clare Spottiswoode has, like her electricity counterpart Professor Stephen Littlechild, earned a reputation with users as having a friendly ear but being slow to act.

As electricity is the largest utility spend for the majority of our members, prompt and decisive action by the Regulator is essential. The fact that Littlechild has only now introduced proposals to slash the exorbitant profits made by the National Grid for providing its transmission services has not won him many friends in the MEUC. He is seen as having been forced to take this action following Clare Spottiswoode's acceptance of the need to curb British Gas's transportation profits.

Littlechild insists that his proposals do not represent a tougher stance but that he is merely reflecting his experience over the last few years. Users, meanwhile, are reflecting that they have been complaining about overpaying for the Grid in the six years since privatisation and wish he had agreed with them sooner.

The MEUC's greatest contribution in reducing energy costs for business is our ability to bring up to 130 buyers together at any one time to share information on who is most likely to offer them the best prices and terms, and what contract clauses and negotiating ploys they should avoid.

We have also aided the careers of many energy buyers by giving them opportunities to speak at meetings and conferences, enrolling them in strategy teams where they rub shoulders with some of the shrewdest procurement specialists in the UK and enabling them to meet Regulators, suppliers, civil servants, politicians and MMC and OFT officials.

We have now started work on an Electricity Skills Register so that members can draw on each other's expertise in a wide range of issues - connection agreements, contract conditions, data handling, EFAs, energy management, European issues, jargon, load management, metering, monitoring and targeting, negotiation techniques, own generation, pool price movements, preparing for the 1998 market, profiles, settlements, tariff software, tariff structures, tender analysis, top-up supplies and use of system charges.

Effective though the user lobby has been, its poor financial position puts it at a disadvantage when it finds itself up against well-heeled suppliers, government and official agencies. Low MEUC subscriptions (£1,250 at present but set to rise) means that our total income of £250,000 enables only limited research into prices and problems.

Suppliers have the funds to commission expensive research to prove their case and I am always alarmed by their enormous financial advantage. When we have found funds for research, Regulators have read our conclusions and substantial benefits have resulted.

This financial gap also manifests itself in the disparity between the salaries and conditions of the buyers and the sellers. The salesman all too often earns more than the customer, has far superior training and leads an altogether more comfortable life.

At the recent Electricity in Europe 1996 conference in Geneva, the 110 delegates spent £1,000 each to attend for two days and there was not a single customer present. Presentations there included one from a supplier exhorting everyone to exploit the opportunities in the market and one from a top US marketing consultant on how to identify lucrative customers and how to woo them with incentives.

Suppliers of electricity, gas and water will continue to look for higher rewards each year and the MEUC's role in advising on superior buying strategies and in lobbying for increased supplier efficiency coupled with fairer prices and contracts will become increasingly valuable.

Andrew Bainbridge
Director General, Major Energy Users' Council

The UK has been playing host to an Eastern European delegation at Rover's flagship plant at Longbridge. A group of nine Russian delegates from both privately-owned industry and state-run energy committees have spent a week in London and Birmingham on a fact-finding mission into the basic principles of energy efficiency in industry. Organised by the March Consulting Group, in conjunction with Danish consultants COWIconsult, the project was aimed at supplying a comprehensive introduction to the value of energy auditing, monitoring and targeting and was funded by the European Commission's THERMIE programme. High on the training agenda was an insight into UK energy sourcing and a demonstration of the latest equipment and computer software. The visitors also discovered the secrets behind the efficiency of Rover's combined heat and power station at Longbridge in Birmingham. Pointers were given as to ways in which significant energy savings have been made at the factory.

National Power-led consortium wins Australian power plant

A CONSORTIUM led by National Power has successfully bid $A2.35 billion (£1.2 billion) for the Hazelwood Power Corporation which runs a 1600 MW power station and coal mine in Australia. National Power is to invest around £340 million in a 52% equity stake in the consortium. The Company's partners are American utility PacifiCorp, Destec Energy Inc (owned by Dow Chemicals), and Commonwealth Bank of Australia.

The brown coal power station and mine are situated in Victoria's La Trobe Valley some 90 miles from Melbourne.

Hazelwood, previously owned by the State of Victoria, is the second generating plant to be sold under the State's privatisation of its electricity industry. The power station currently trades in the Victoria pool market, modelled on similar lines to the electricity pool in England and Wales. Around 90% of Victoria's electricity is supplied by four brown coal power plants - Hazelwood, Loy Yang B, Loy Yang A and Yallourn.

The 1600 MW Hazelwood plant was commissioned in 1971, and four of its eight generating units were reconstructed in the mid-1980s. Six units are currently operating in base (continuous) load and intermediate capacity; and the consortium intends to refurbish the remaining two to full operational capacity.

Over the five years to 2000/01, around 50% of Hazelwood's anticipated income is secured under contracts established under the State government's privatisation policy.

Hazelwood is supplied by an adjoining open cast brown coal mine. It has more than 30 years of reserves, which are included in the acquisition. The operation of the power station and mine will be integrated.

Keith Henry, National Power's Chief Executive said: "Hazelwood is our biggest overseas investment so far, and the plant should make a strong, early contribution to group earnings. We intend to utilise our skills and resources to maximise Hazelwood's excellent prospects in a market that is similar to our own at home. These prospects not only lie within Victoria, but also in adjoining States as the national market is introduced in Australia. The availability of the brown coal reserves will ensure that Hazelwood will remain a low cost electricity producer, thereby providing us with a great opportunity now and in the future."

Completion of the deal will give National Power investments in around 7,000 MW of capacity overseas.

British Gas to explore for oil and gas in the Red Sea

A CONCESSION Agreement for exploration in the northern Red Sea has been signed in Cairo between the Arab Republic of Egypt, the Egyptian General Petroleum Corporation, British Gas Exploration and Production, Edison International Spa and LASMO Oil Egypt Limited. The agreement is for an initial four year exploration period, during which there is a commitment to spend a minimum of $6 million exploring the area, including the drilling of one well.

Covering more than twelve thousand square kilometres, the new concession, called North Red Sea Area Block 1, includes nearly half of Egypt's Red Sea waters. British Gas is operator, with a 44% interest, while LASMO and Edison have interests of 36% and 20% respectively.

Cairo based British Gas Country Manager, Dr Hugh Miller said, "The award of the Block 1 concession has secured for Egypt a substantial commitment to evaluate the exciting untapped hydrocarbon potential of a huge area of the Red Sea. British Gas is now represented in all of Egypt's oil and gas provinces, which further emphasises the company's commitment to become a major player in the country's energy industry."

Institute publications

The basis for publication of Energy World and the Yearbook is currently under review at the completion of the present contract with the publisher. It is therefore appropriate at this time to reconsider the nature and content of the publications and to improve them, in terms of both their contribution to the services provided to members by the Institute, and in order to enhance their value to other subscribers.

While this review of both style and content is under way, interim arrangements have been made to cover the next few months. The Institute apologises for any late delivery of the magazine in the next few months. We aim to complete the review in time to "re-launch" a much improved publication in January 1997.

Readers and contributors are asked to note the new editorial address, which is:

The Institute of Energy, 18 Devonshire street, London SW1WN 2AU. Tel: 0171 580 7124, fax: 0171 580 4420.

Londson's new all-electric buses

BRITAIN's latest fleet of environmentally-friendly electric-powered buses - Camden's Plus Buses - took to the road this summer with the assistance of London Electricity (LE).

Camden Community Transport, who pioneered the project with Camden Council and Camden and Islington Health Authority, sought technical, financial and marketing help from LE, who were pleased to contribute over £50,000 to the development of the project. This included the installation of an upgraded electricity supply to the Arlington Road bus depot and a new supply to the transformer at the depot which will charge up the vehicles. LE also provided the service to the on-street charging point at Lincoln's Inn Fields.

Since they produce no emissions - no black smoke or unpleasant fumes - whether on the move or stationary, passengers and people on the roadside can breathe more easily and traffic jams are less shrouded in pollution.

The Camden project - codenamed ASTI (Accessible Sustainable Transport Integration) and backed by the European LIFE project and the DTI - is designed as a unique experiment in combining the latest pollution-fighting technology in fuels, satellite tracking and transport telematics. Initially, it will offer a door-to-door service, with six electric and gas-powered minibuses crossing the borough on a network of routes, with diversions to pick up passengers from their homes.

Camden's Plus Buses are converted from the IVECO Ford TurboDaily van, which, already in use in the district, is big enough to take 12 passengers and wheelchairs, with good clearance form the ground and a sturdy chassis. The buses are designed to cope with a heavy load and slow traffic, yet can accelerate and slow down without impairing performance in congested traffic.

Local MP Frank Dobson, with Andrew Wincott of LE, powering up one of Camden's Plus Buses.

New law boosts energy saving market

A NEW Act of Parliament, which will expand the market for all energy saving goods and materials, received Royal Assent in August. The 1996 Energy Conservation Act extends the operation of the 1995 Home Energy Conservation Act to include one million people who live in "multiple-occupied" homes, plus the estimated 10,000 who live in houseboats.

Like its predecessor, this Act was the result of a campaign run by the Association for the Conservation of Energy (ACE). The Association drafted both Bills, and assisted two back-bench MPs - Diana Maddock (LD, Christchurch) and Alan Simpson (Lab, Nottingham South) - in piloting them through Parliament as Private Members' Bills.

Both Acts help to reduce energy waste in existing housing, increasing comfort and reducing pollution and fuel bills. They do this by giving local authorities duties to draw up plans, to save 30% of current energy use within the next decade.

Welcoming the new Act, ACE director Andrew Warren said: "Both these items of legislation are most unusual. Neither have been prepared by Government, nor been sponsored by a Conservative MP. Such success two years running demonstrates clearly the cross-party enthusiasm that exists to expand investment in energy saving".

ACE is already promoting a third Bill on energy conservation. This would require an energy survey to be undertaken on each home sold, before a mortgage can be granted. Its sponsor is former Conservative Environment Minister Tim Yeo (Suffolk South). He has contacted every financial institution in the country, seeking their positive response.

Meanwhile, to assist local authorities with preparing their reports and plans under the Home Energy Conservation Act, the Energy Saving Trust has set up an award scheme. With a national budget of £4.7 million for 1996/7, individual awards of up to £500,000 per authority are on offer.

EST to expand network of local energy advice centres

THE Energy Saving Trust has announced plans to expand its highly successful network of Local Energy Advice Centres (LEACs) from the current 32 to between 40 and 50 by mid-1998. This follows approval of the Trust's three year LEAC business plan by the Department of the Environment.

Under the Trust's direction, the LEACs have made a considerable impact since the start of a three year Government-funded pilot scheme in October 1993. Around 96,000 customers have received free, impartial energy efficiency advice, and their actions in response have led to average fuel bill savings of £34 per household - £6.67 million in total. In turn, 70,500 tonnes of carbon dioxide per annum are being saved directly as a result of LEAC advice.

Such success has convinced the Trust that an expanded network could generate even better results for energy efficiency. To manage the expanded network, the Trust is to set up 6 to 10 Regional Centres, each of which will lead and develop a number of existing and new LEACs. Present members of the network are being invited to tender to become a Regional Centre. There will also be a greater emphasis on sourcing external funding.

LEACs currently receive 50% of their local funding from the Trust (via the Department of the Environment) as well as central support services. The remaining 50% is sourced by each LEAC from local authorities, charities and other public and private sector sponsors. The Trust's decreasing funding profile from the Department (£25m this year, £15m in 1997/98 and £10m in 1998/99) places an increasing demand on the LEACs to become more self-sufficient in the future.

The Trust is therefore funding existing LEACs to develop a three year business plan, with the prime objective of developing new sources of external funding. New Centres which wish to join the network will need to obtain 100% funding, much of which is expected to come from local authorities as they work to meet their requirements under the Home Energy Conservation Act. The Trust will continue to provide all LEACs with a support package of software, training, operational guidance, local and national promotion, quality assurance standards and market research.

Organisations interested in joining the network should contact Glyn Charlesworth at the Energy Saving Trust on 0171-931-8401.

Training and career development through energy management – a strategy

The Department of the Environment's Energy Efficiency Best Practice programme started its training and development activities in 1990. In February this year a new strategy, that builds on previous work, was adopted by the programme. This article aims to give the reader an introduction to the new strategy together with the background to previous strategies.

Under the 1990 strategy, the prime emphasis was on encouraging training for energy management professionals and highlighting its benefits. Some emphasis was also placed on producing suitable material for undergraduate engineering degrees. This resulted in the development of several case studies and teaching packages. The 1992 strategy review took a more proactive approach by exploring the underlying framework of energy management training in the UK. This led to a number of findings. Although the wealth of good training material was not disputed, the review found that there was little in the way of a national benchmark of competence, nor much information on what was needed by industry nor, more importantly, what training was wanted by the energy management professionals themselves.

A study the EEBPp, conducted with the Management Charter Initiative in 1993, highlighted a number of interesting points including the fact that many energy management professionals want to improve their "people-centred" skills, for example, in the areas of presentation and staff motivation. There are also many who want a qualification that recognises their current and past achievements. The type of training preferred showed that flexible learning and outcome-based learning are both gaining popularity.

The EEBPp responded by initiating the development of the Standards for Managing Energy with a range of partners. Another initiative started was a partnership with the Institute of Energy to develop an opening learning programme which resulted in the Training in Energy Management through Open Learning (TEMOL) course (see article under Institute News on page 20).

Two of the main thrusts of the 1992 strategy review were the establishment of a national framework for energy management training, and the setting up of partnerships with businesses, professional bodies and other groups to encourage the application of new ideas and novel training solutions in energy management.

Through these partnerships, the EEBPp also reviewed its audience. Hitherto, the main focus group was the professional - whether as energy manager, works engineer or performing some other combined function. Over the past two years, the EEBPp has expanded its partnerships towards the financial community and to front-line operators and supervisors.

The 1996 strategy outlined five distinct groups:

- executive and management;
- professional and managerial;
- technical operators;
- non-technical operators; and
- undergraduate and postgraduate students.

Initiatives towards these groups form the basis of the new strategy. This segmentation provides an integrated approach towards targeting each of the groups and allows a better utilisation of available resources.

The launch earlier this year of the Standards for Managing Energy and the accompanying Continuing Professional Development manual, based on the Standards (partners: The Engineering Council and the Institute), signalled a milestone in the development of energy management training material. There is now a set of nationally recognised benchmarks for good practice and guidance toward achieving them. The national and regional launches generated extensive enthusiasm and momentum with the Institute being in the central position to manage the recently approved National Vocational Qualification Units on Managing Energy.

The relationship between the EEBPp and the Institute has also been formalised so that now the Institute has been contracted to support the Standards and the Vocational Qualifications on behalf of the EEBPp.

This has allowed EEBPp resources to be shifted away from the professional segment towards the operator segments. This is to acknowledge that in many instances it is the operator who has the ultimate impact on energy management. Up to now, most of the emphasis has been on the technical specialists, but there is also a need to provide assistance to other workers. These non-specialists may literally have their finger on the button and can make the difference between a successful energy savings programme or an embarrassing failure.

In partnership with the Amalgamated Engineering and Electrical Union (AEEU) and the Institute, the EEBPp has initiated a project to develop energy awareness training material for young workers - whether trained as a Modern Apprentice or not. This project attracted extensive support from industry, especially from National Grid plc and Seeboard plc. It is about to approach a stage when site-piloting of the draft training material will take place.

The EEBPp has a busy year ahead. Currently there are joint projects with the Institute to pilot the Vocational Qualifications; it is envisaged that there will be more initiatives to support both technical and non-technical operators in improving their energy awareness. Formal education and training are not forgotten either, as there are plans to explore the development of case study-based teaching materials for undergrad-

uate degree courses as well as the publication of case study material aimed at MBA students.

Most of these new initiatives come from the EEBPp's partners. Specialists from the EEBPp are always interested in receiving new ideas and suggestions from all energy users and we are also actively looking to increase our range of partnerships. The training and development activities of EEBPp are there to serve your needs. If you wish to take part in some of the projects mentioned, please contact us.

For more information, contact:

- Uly Ma, ETSU, Harwell, Didcot, Oxfordshire, OX11 0RA. Tel: 01235 432 285 (for all non-VQ/Standards-related activities).
- Louise Evans, the Institute of Energy, 18 Devonshire Street, London, W1N 2AU. Tel: 0171 580 7124 (for all VQ/Standards-related activities).

The Energy Efficiency Best Practice programme is designed to advance and promote the spread of good practice in energy efficient technologies and techniques throughout the UK economy - in industry, commerce and the public sectors. The overall aim of the programme is to stimulate energy savings worth £800 million per annum by the year 2000, with an associated reduction in CO2 emissions of 18 million tonnes per annum.

The programme is managed on behalf of the Department of the Environment by ETSU for industrial processes and by BRECSU for energy efficiency in buildings.

General information on the Energy Efficiency Best Practice programme, including visual and audio material, publications and advice, is available free of charge to UK industry, from the Energy Efficiency Enquiries Bureau, ETSU, Harwell, Didcot, Oxfordshire OX11 0RA. Tel: 01235 436747. Fax: 01235 433066.

EDUCATION & TRAINING

Standards for Managing Energy – the story behind the development

Following the establishment of the Vocational Qualifications (VQ) system in the latter part of the 1980s, the then Department of Energy suggested to the then Department of Employment that there should be a set of occupational standards for energy management and an industry Lead Body to lead such developments. The Employment Department responded by saying that energy management could be considered as a managerial/management activity and as such, it came under the management and supervisory lead body - Management Charter Initiative (MCI). The Employment Department then commissioned two consecutive studies on energy management and energy managers, which were carried out by CREATE and Pointing Consultancy Services respectively. These reports provided a picture of energy management at the time and recommended that steps needed to be taken to develop standards.

The national Standards for Managing Energy were launched by the Minister for Energy Efficiency, Robert Jones MP in February 1996. This was followed by regional launches in Northern Ireland and Scotland and further launches are planned for North and South Wales later this year. Over 800 people have attended the launches so far and during the development, over 900 individuals helped in their development. The Standards constitute a world's first in energy management development and training. This article outlines the course of the programme's history and provide some background on the decisions taken during development.

In October 1992, CREATE, ETSU, the Employment Department and MCI met to explore the concept of "Energy Management Standards". It was disclosed then that the Employment Department had no funding available to support the development of energy management standards. ETSU and MCI then explored the development of these standards with the support of the Department of the Environment's Energy Efficiency Best Practice programme(EEBPp),. This was facilitated by a third study early in 1993, commissioned by MCI and supported by the EEBPp to explore the roles and functions of energy managers.

Some of the findings are shown on the diagrams. These show the percentage of time spent on energy management and whether the group analysed are full or part-time managers: where less than 50% of their time is spent on energy management, the group has

been called part-time and over this percentage, full-time.

There was also support for a qualification and a declared need for management skills. A workshop was held in April 1993 for consultants and trainers where the project partners, by then including the Institute of Energy, declared that it was an open project and welcomed the involvement of all participants in the UK energy scene. Anticipating that there would be a need for training materials, the EEBPp joined the Institute, the University of the West of England and the SAVE programme of the European Union in a partnership to develop an open learning programme which is now available as the Training in Energy Management through Open Learning (TEMOL) course.

In December 1993, MCI was commissioned by the EEBPp to develop a set of occupational standards for energy management. Industrial support for developing the Standards, a first in the UK, was forthcoming from British Gas and the Electricity Association. An advisory group was set up and one of the first points of debate was "energy management/energy manager" versus "managing energy". This was important because surveys have found that almost 50% of energy management personnel have other roles and functions and therefore are not solely energy managers. "Managing Energy" therefore covers a broader spectrum of people and will encourage those with multiple roles to use the Standards as well.

Another interesting debate concerned the wording of the Standards. Many readers may have blanched at the rather legalistic language of the Standards but the need for clear English is balanced by the need for a syntax that is not ambiguous. Every single *performance criterion* in the Standards must be measurable – therefore, phrases such as "*the monitoring process must be properly carried out*" is not acceptable as "*properly*" is not measurable. Hence, there is a need to explicitly state just about everything and there is no place for implied items in the Standards, even though these terms play a significant part in daily usage

A consultation paper was prepared for public comments in April 1994 and the Standards project was introduced to UK energy management personnel. Throughout the rest of 1994 and early 1995, a number of draft standards and revisions were reviewed either individually or by energy managers in workshops, managed by the Institute in partnership with the EEBPp. At this time, another partnership was set up between the EEBPp, the Institute, MCI, the Engineering Council and Pointing Consultancy Services to develop a Continuing Professional Development (CPD) pack based on the Standards.

Throughout the development, there was healthy debate about the roles and functions involved in managing energy. One discussion was about the "*Key Purpose*" statement and it was changed, finally, to read: "*to ensure the effective management of energy resources to meet the organisation's objectives*" rather than "*to ensure the effective use...*". This was because there is a need to emphasise the role played by energy management personnel in purchasing energy or in contributing to energy purchasing decisions.

By late 1995, the draft Standards and the CPD pack were reviewed by over 900 individuals in the UK, and the Standards were then submitted for approval to the national accrediting authorities - the National Council for Vocational Qualifications and the Scottish Vocational Educational Council. The Standards were officially launched at a meeting in London on February 6th by Robert Jones MP, Minister for Energy Efficiency and which was chaired by Michael Roberts, past president of the Institute.

For more information please contact:

- Uly Ma, ETSU, Harwell, Didcot, Oxfordshire, OX11 0RA. Tel: 01235 432 285 (for all non-VQ/Standards-related activities).
- Louise Evans, the Institute of Energy, 18 Devonshire Street, London, W1N 2AU. Tel: 0171 580 7124 (for all VQ/Standards-related activities).

Time spent on energy management

The results were analysed to see the distribution of time spent on energy management

	Percentage of time spent on energy management			
Sector	less than 25%	25–50%	50–75%	over 75%
Industrial	4%	8%	5%	11%
Commercial	4%	2%	1%	9%
Public	5%	6%	5%	23%
NHS	2%	4%	2%	9%
Total	14%	20%	13%	53%

Interest in accreditation of prior learning (APL)

There is a high level of interest in APL among the survey respondents

	Part-time energy managers	
Sector	Prepared to undertake formal training	Interested in APL
Industrial	81%	81%
Commercial	50%	50%
Public	64%	86%
NHS	86%	86%

	Full-time energy managers	
Sector	Prepared to undertake formal training	Interested in APL
Industrial	67%	90%
Commercial	71%	86%
Public	63%	82%
NHS	73%	87%

Standards . . . What can they do for you?

The Standards for Managing Energy describe in detail the function and responsibilities of those who manage energy with the key purpose "*to ensure the effective management of energy resources to meet the organisation's objectives*". This breaks down into three key roles:

- the appraisal, development and promotion of strategies;
- the stimulation and evaluation of organisational performance in controlling energy use; and
- the financial control of supply and consumption.

These key roles break down further into units and elements with performance criteria which, step by step, describe the role of the individual who has responsibility for managing energy within the organisation in fine detail. That individual may be full time or part time, solely responsible for managing energy or a member of a team – it doesn't matter. What is important is that here is a generic benchmark which sets a national standard of professionalism and best practice in the field.

How can you use these Standards? In a variety of ways and in part or as a whole. The structure of the standards enables you to refer and make use of particular units or key roles down to individual elements. This structure provides that flexibility because the authors of standards acknowledge that although generic across a particular field, not all the content will apply to each individual working within the particular field. This is most certainly true of energy management. As we reported in February, energy management is a diverse and complicated occupational area which is directly reflected in the length of time it took to develop the standards and the very reasons behind their existence – to recognise the function and raise the profile of the energy manager. This said, lets look at how the standards can benefit you as an individual and strengthen your organisation.

The February issue of *Energy World* reported on the London launch event of the new National Standards for Managing Energy, and as this feature has already highlighted subsequent success stories have taken place in Northern Ireland and Scotland, with two Welsh events to follow in the autumn. But what happens once the euphoria of a new product launch dies down? Who do you contact to get hold of the product and how do you establish it's potential value to you? Natural questions to many of us who have yet to explore what the Standards for Managing Energy actually mean for individuals and their organisations.

The table below identifies the more popular uses of national standards which provide a framework for continuous improvement.

How the standards can be used

By the individual	For CPD development plans – for self assessment to judge knowledge and performance
	For planning current and future skills requirements
	To obtain N/SVQ unit certificates in Managing Energy as formal recognition of achievement
By the organisation	To set job descriptions and define the energy responsibilities within the organisation
	To link those to organisational objectives for individual members of staff providing a framework for interaction
	To help senior management understand the full implications and importance of energy management activities
	To devise staff development programmes in line with energy management best practice and organisational objective

Additional products to the Standards have already been produced to assist the individual to make best use of them. One of these is the CPD in Managing Energy Manual which is built directly upon the Standards. The manual contains a full set of the standards together with several interactive exercises and a self assessment analysis tool to identify training resources and learning styles of the individual. It can be used to identify training and develop a personal professional development plan using the standards as a performance benchmark. This is where this particular manual is unique to those provided by the Institutions because it is integrated directly with national standards of performance and can be used to assist the individual to gain formal recognition through the Vocational Qualification framework.

The Institute of Energy is the first national delivery centre approved to award Vocational Qualification Units in Managing Energy. Currently it is working with the Department of the Environment and the awarding body, the University of Oxford Delegacy for Local Examinations, to run a pilot programme due for completion in the late autumn. This will

allow those interested parties to work together within the VQ system to establish a network or organisations providing the new qualifications for energy management professionals to work to achieve. This development is especially good news for those individuals who have no formal energy management qualifications currently. If you are interested in being a VQ assessor or potential candidate to obtain these units please contact the Institute.

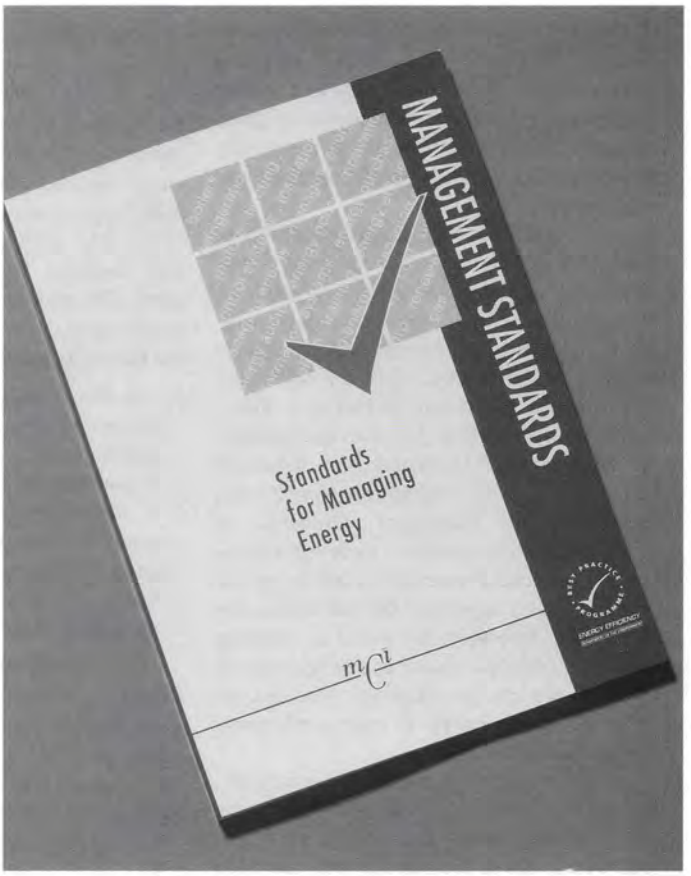
By invitation, staff at the Institute of Energy will be happy to come and talk to local energy and environment groups, TECs and other groups about the uses of the standards and explain their structure in more detail, simply contact the Institute.

The final product which is currently available to support the standards is the *Good Energy Manager's Guide* which contains 74 easy reference checklists translating the jargon of the standards into plain English! This is a handy addition to any energy manager's tool kit and at the preferential rate of £10 to members of the Institute it is also value for money.

Finally, it is fair to say that these standards have been produced with all the best intentions and from conception to conclusion much investment and effort has gone into producing a valuable product for energy managers and their organisations. The project partners have fulfilled their part of the deal - now it is up to each of you as energy management professionals to use the standards and prove the benefits as tangible ones to you in your own personal development and for your organisation in terms of financial bottom line savings.

For more information please contact:

- Louise Evans, the Institute of Energy, 18 Devonshire Street, London, W1N 2AU. Tel: 0171 580 7124. Fax: 0171580 4420.



Energy efficiency from the front line

Who is actually saving or wasting most of the energy used in your workplace? Is it the directors, the managers, the engineers? Or is it the people operating the equipment, the processes and the support services?

All too often, the plans are developed from the Olympian heights of the board room and cascade down the tiers of the hierarchy. As in all flowing systems, there are many ways to dissipate the kinetic energy. Unwitting dams and barriers, sometimes in the form of middle management, can reduce the torrent of good intentions, mission statements, and visionary milestones to a mere trickle of "another management fad".

The Department of the Environment recognises that measures to improve energy efficiency can only succeed when everybody in the workplace is involved. The process cannot be seen only as requiring action by one single group. The DoE's Energy Efficiency Best Practice programme (EEBPp) is therefore working in partnership with the Institute, the Amalgamated Engineering & Electrical Union (AEEU), the Engineering Council and the Engineering Employers Federation, as well as many other partners, to develop training and awareness materials (a full list of the project partners appears at the end of this article). These resources are aimed at enabling workers on the operational end to be aware of the need for energy efficiency and to contribute to improvements in energy efficiency within their organisations.

As with many of these partnership projects, the partners have specific areas of interest as well as shared needs. The AEEU, for example, would like a programme that can help develop energy efficiency amongst young engineering apprentices at the start of their training programme. A major supermarket would like an awareness programme to help its shelf-stacking staff to understand why they should be saving energy. A contract labour company wants its staff to help reduce the energy costs of the company's clients. All these individual requirements were addressed by the project team which was led by the Institute of Energy and managed by Pointing Consultancy Services.

The project started in the summer of 1995 and the first task of the advisory group was to explore the roles and functions of various levels of non-managerial/non-professional staff. The findings are described in a set of learning objectives (copies of which are available from ETSU, see contact details at the end of the article). These objectives were then used as the basis for the development of detailed training materials. The technical development of these materials was led by William Battle Associates. The developmental team took the view that the initial output would be aimed at the supervisor, senior operator, the Modern Apprentice or NVQ Level 3. The material could then be adapted for staff working in roles equivalent to NVQ Levels 1 and 2.

The first draft of the Level 3 material is now available for pilot testing by energy users. The piloting is aimed not just at refining the material but at finding the answers to the following questions:

1 Can this material be used in training programmes within your organisation? A question that will be addressed to human resources managers.
2 Is this material relevant to your team's needs? To be addressed to team leaders and supervisors.
3 Will you use this material? A question for the workers/operators.

The contents of the training material is structured so that the user is given basic information to promote awareness, and then encouraged to undertake a survey of the workplace which culminates in making a report to his or her own supervisor. The layout of the draft material is as follows:

- Foundation – what is energy, how is energy usage measured, and how is energy bought?
- Collecting facts – find out about the organisation, the energy using services and processes.
- Investigate – analyse the facts collected and think about how energy efficiency can be applied.
- Recommend – report the findings and present suggestions to supervisors managers.
- Promote – how to motivate others and how to review performance.

The piloting is planned to take place in early autumn and, as in all the joint activities between the Institute of Energy and the EEBPp, energy users are welcome to join on the fast track to improved energy savings. If you wish to take part in the piloting and gain an early glimpse into the training material, contact the team at one of the addresses below. This is your opportunity to make sure that what is needed gets into the training package and that your work is supported by other staff in your organisation.

Contacts:

- Lynn Williams at AEEU – concerning general training in engineering, apprentice development. Tel: 0137 246 3042.
- Louise Evans at the Institute of Energy – concerning piloting the training material. Tel: 0171 580 7124.
- Uly Ma at ETSU – on behalf of the Energy Efficiency Best Practice programme. Tel: 01235 432 285

Partners in the project:

Amalgamated Engineering & Electrical Union
Bhs Plc
The Body Shop
Business in the Environment
Energy Efficiency Best Practice programme, DoE
The Engineering Council
The Engineering Employers Federation
The Environment Council
The Institute of Energy
Kingston University
The Local Government Management Board
Living Earth Foundation
Management Charter Initiative
MSF Union
National College of Electrical & Mechanical Engineering
National Grid Company plc
Pointing Consultancy Services Ltd
J Sainsbury plc
SEEBOARD plc
Thorn Lighting Ltd
William Battle Associates

Training professionals in the energy industries of the Former Soviet Union

by George Roberts, John Dingle** and Konstantin N Milovidov****

The Oxford-based College of Petroleum and Energy Studies has been involved with several training initiatives in the Former Soviet Union. Here, the authors describe the approach to a region in transition to a market-oriented business environment.

In the new energy corporations of the Former Soviet Union (FSU) born out of the operating enterprises of Ministries, and in the reconstituted Ministries themselves, financial resources no longer flow from the top by allocation. They are increasingly being earned through the trading activities of each enterprise, thereby creating an upward flow of funds from operating units to shareholders. The reversal of flow of financial resources and demands of a nascent internal market economy (the international market beyond the Soviet Union has always functioned more or less "naturally") is creating managerial autonomy, as operating units and individuals are increasingly required to take decisions by themselves, although they have not, in the past, been experienced in working this way.

In the Soviet Union, rather than operating the economy for the purposes of wealth creation, the state operated the economy for the expressed purpose of meeting needs. With an aversion to "profit", Soviet economists worked, instead, to achieve material balance across the whole economy. This necessitated operating complex models for determining the allocation of resources, goods and services, rather than allowing markets – supply and demand – to act to determine problems of allocation. The study of "techno-economic" problems, therefore, occupied a great number of Soviet citizens, nowhere more so than in the energy industries.

As the Soviet economic system was not geared to "wealth creation" via the production of surplus value retained as "profit", and depended on the operation of complex models, much surplus value generated by production operations was ploughed into "knowledge-creation". Although there was not a commercial middle class in the Soviet Union, there was a vast intellectual middle class involved in the production of knowledge. Access to many of the middle class benefits of society was determined by intellectual achievement rather than commercial achievement. This gave Soviet professional training a flavour very different to that of the West. Knowing how to do something or why something works appears more significant than actually doing it, while in the West it is often heard, "I don't know why it works, but it does".

The learning culture of the Soviet Union

A Soviet Diploma Engineer (first degree) follows five years of study: three years general science, and two years specialisation. The main Soviet mode of formal Continuing Professional Development (CPD) was study toward a Second Diploma. A Second Diploma course was followed part-time over a period of two years. During this two years, participants would attend approximately 16 to 20 weeks of instruction, four to five weeks per semester for four or five semesters. During the intervening periods practitioners were given work-based and academic assignments to complete. This practice has largely stopped for two reasons. First, and simply, in the general collapse of the economy, enterprises no longer had the funds to pay. Second, there had been a dramatic shift in the nature of the upgrading courses required.

While enterprises still need technically qualified staff, even more they need people who can assume the responsibility for the management of enterprises in a fundamentally different economic climate. The traditional up-grading courses did not respond to this new requirement. Only now are steps being taken to develop courses to meet these new demands. In some instances these steps have been drastic. One large organisation said it "liquidated" its higher training institute because the instructors could not provide the kind of courses which were now required. Other training institutes are hurriedly developing courses for the new conditions.

Competence-based versus knowledge-based professional development

Much that has been said and written about economies in transition leaves out of consideration what managers must actually do to manage economic activity. And, due to the theoretical, knowledge-based training of Soviet professionals it is very easy, when conducting training programmes in the FSU, to become diverted from the functional learning objectives of Western-style competence-based training.

Competence is simply the capability to perform, and – in line with the NVQ approach – to perform at a level which can be assessed against specific criteria in a specific range of circumstances. It follows that: as the nature of the management task changes under the influence of economic transition; as risk, uncertainty and unpredictability increase with increasing orientation to market forces; as managers rise to positions of greater accountability (being responsible for the work of other people; for the allocation of substantial resources) then the manager's necessary port-

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****Professor of Economic Modelling, Gubkin Academy, Moscow*

Kazakhstan: training located within ministry structure

From 1993 to 1996 the authors have been involved in a training project located within the ministry structure of the Kazakhstan energy sector. This project started with a sectoral analysis of training needs. The resultant training programmes included 13 short courses conducted in Almaty, an extended project-based learning programme implementing environmental management systems in an oilfield in Aktau, scholarships to the UK, and distance learning programmes.

The process of inviting participants to training programmes begins with the Ministry, which issues an instruction to state enterprises asking them to put people forward. Many enterprises do not yet appear to have taken training into that area in which they exert independent authority and initiative. This might be expected where transition economics dominates. Enterprises take initiative where tangible benefit can be realised. Intangible benefits, such as training, are left to the ministry. However, even if training is in the national interest, the organisation of training is not necessarily one of the strengths of a ministry. The rhythms of a ministry are dictated by political and economic events in its sphere of influence. The ministry is principally a client, or agent for a group of clients of a training centre. It is inappropriate to expect a ministry to co-ordinate training programmes, while at the same time developing policies, negotiating physical oil swaps with Iran, and pipeline agreements with Russia.

folio of competences must expand in line with increased accountability, as well as matching the demands of the changing business environment. This is the rationale of competence-based Continuing Professional Development (CPD).

Management tasks implied by economic transition might be, for instance, one or several of the following:

- to ensure that plans and targets established by a higher authority are satisfactorily achieved;
- to plan and administer so as to safeguard inherited assets;
- to ensure the smooth running of complex operations;
- to make profits so as to maximise the dividend payable to shareholders;
- to optimise operations in terms of customer loyalty to the organisation.

None of these tasks necessarily excludes any other, but their relative priorities depend on the economic organisation's orientation to the market. Because the market economy changes, task priorities are liable to change. Consequently, the portfolio of competences that management staff need to do their jobs will also change.

Competence-based CPD needs to be given clear objectives. The first step is to carry out some form of training needs analysis (TNA). Two problems arise:

1. TNA is often seen as threatening, a device for identifying sacrificial lambs for the altar of business re-engineering (a view not unknown in the West). In fact, the aim is to identify precisely how to help people do difficult jobs better. It is competence enhancement analysis, rather than training needs analysis: not a threat, but a considerable benefit. Usually, we find this approach is accepted. Sometimes, regrettably, employers' actions justify employees' cynicism.
2. The numbers of people involved are very large, and the time for demonstrating that something useful has been achieved is very short. The only way to make progress at a reasonable rate is to train local HRD people to use competence enhancement analysis methods themselves. We use a technique which relates individuals' existing capabilities to models of international practice to identify core competence requirements as a basis for integrating training courses, training in the work place, and distance learning.

This integration of course-work, on-the-job training and distance learning is of the greatest importance to the evolution of competence-based CPD. As outsiders, we are offering the seeds of a new approach to management training. How can we help them to take root and grow? Our approach has been to develop *project based learning* as a link between teaching and doing. (As Nero Wolfe put it, "It is only when you undertake to use what you have learned that you discover whether you can transform knowledge into performance.")

When we talk about a manager's "portfolio of competences" we are introducing a relatively new concept. Competence as the primary objective of education and training came to the fore in the UK during the late 1980s, with the introduction of National Vocational Qualifications (NVQs). The concept is still not fully developed, notably for the training of professionals (NVQ Levels 4 and 5). So it is not surprising that the idea that a manager needs a portfolio of competences adaptable to his/her management task is an idea unfamiliar in the FSU and the countries of central and eastern Europe where the training of professionals follows the FSU tradition. And, in fact, the culture of management - "the way we do things round here" - has been very different in these countries.

Getting competence-based CPD to take root in a new environment depends on effecting a culture change in organisations. Perhaps the most important element in this is for training policy makers to set their objectives in terms of training for doing, rather than training for knowing, and to design and deliver training for performance, rather than training for knowledge. Here, the role of the mentor is crucial. In the west, senior professionals accept a duty to support the development of their juniors, although the ideal is often undermined by the pressures of the market place. Market pressures are even

Russia: training located within university structures

From 1992 to 1996 the authors have been involved in an extended institutional strengthening programme at the State Oil and Gas Academy (Gubkin), and from 1994 working in a consortium at the Tyumen State Oil and Gas University. These programmes included short courses taught in the institutions, distance learning programmes and short study visits to the UK.

The rhythms of a training institute are different to those of a ministry. The training centre is a service supplier, and must be aware of the needs of the clients. We believe that, by strengthening training institutions, whose clients include ministry people, as well as people from industries, the competence of a nation will be enhanced to a greater degree than by locating a training programme in a ministry. Therefore, all programmes delivered are to an extent "training the trainers". Training of the sort intended to facilitate technology transfer, is by no means the exclusive preserve of academics. We identify a broader target group: Management/Specialists. This includes academics, but it also embraces the industry "mentor" and the staff "champion" of new approaches. The impact of the programme would be diminished if it focused exclusively on trainers. Further, when training trainers not working directly in industry we hold it important to involve industry and ministry people in the classroom with the training professionals. The industry is (or should be) principally concerned to improve functional competence, not only to consume the products of academic knowledge. We do a disservice if we isolate trainers from the industry they are supposed to train.

more severe in transition economies, and we need to find ways to encourage mentorship which are practical as well as idealistic.

Another important feature of culture change, imposed by the conditions that professional development must be on-going, and that competence must be assessable, is the need to build training plans and training audits which are consistent with the nature of competence-based CPD. This requires a different philosophy of the relationships between training and career development, which has – over time – to be built into new HRD policies.

Conclusion: a model for training in transition economies

Endemic change affecting the energy industry of the FSU requires organisations to restructure, and adopt new paradigms on which to base their activity. The general model incorporates three elements:

- organisation reviews in the context of enterprise restructuring, re-orientation, or re-engineering
- professional development of policy makers, practising managers, economists, and technical specialists, to enhance the performance of enterprises
- project analysis, evaluation, and review.

Phase one begins with a study of the organisation or sector in which the training programme is to be implemented, and concludes with the selection of the people to participate directly in the programme. Further aims of this study may be to produce recommendations for the restructuring of the organisation or sector under review. This model is particularly suited for facilitating the implementation of asset- and project-based management concepts.

Based on structures identified by the organisation review, an outline of training needs can be prepared. This may be of a general, sectoral nature, describing in broad terms the topics which would be relevant to the organisation, or it may be a detailed analysis of one or more groups, identifying competence gaps, and prescribing, in detail, the learning objectives, methodology, and content of a corrective or developmental programme.

Two categories of participant, who will participate in the training programme, should be identified: Policy Makers or Senior Executives and Management/Specialists. Policy Makers form the group which has overall strategic policy responsibility in the organisation or sector. They are the principal stake-holders in the programme and will determine the priorities and directions for implementation. This group will receive the recommendations emerging from the programme, and will be the final arbiters of the degree of its success. In a large-scale programme, this group may include senior directors or government ministers, their deputies, and department heads and/or senior executives. On a smaller scale, if the model is being implemented in a single department of an organisation, this group may consist of no more than one manager and a few deputies.

Management/Specialists make up the group chiefly responsible for the implementation of the policies set by the Policy Makers. These people will, for the most part, be practising professionals in various disciplines appropriate to the organisation. A key attribute governing the selection of this group of people should be their ability to continue and propagate their development throughout the organisation.

Phase two is the core implementation phase of the model. This phase consists of two principal areas of activity:

- the Policy Makers' Workshop
- Management/Specialist Development Trainin

The aim of the Policy Makers' Workshop is to identify the key issues facing the organisation, and to express those issues in a limited number of statements of Issues for Study. These should be concisely worded expression of topics needing resolution in order to allow transition to be made less arduous for the sector or organisation. The Issues for Study go forward to form the key objectives of the training programmes to be provided for the managers, specialists, and other professionals.

The underlying structure of training for the Management/Specialists should be determined by the real-work environment. As much as possible the principles of "action learning" (learning-by-doing) should be employed. The subject of study should be the managers' own organisation. In all cases, the Issues for Study identified by the Senior Executive Workshop should be incorporated into each course or training activity undertaken.

Training courses for managers must necessarily be short and well focused. The preferred course structure will be three to five days of intensive study and activity directed at business-sector issues relevant to current or near-future work. Other training modes may be used; distance and open learning in particular provide additional flexibility to a training programme. While guided by underlying principles, the courses will be more practical than theoretical, and will have as their general aims:

- internationalisation of the managers' perspective
- strengthening individual and group decision making
- application of commercial and economic principles

The principal output of the professional-development training programme will be a number of reports responding to the issues for study produced by the Senior Executive Workshop. These reports:

- Make recommendations of direct relevance to the sector or organisation in which the participant works
- Integrate the organisational/sectoral/economic topics studied in the courses
- Consider the recommendations in the light of: strategic issues, operational issues, financial issues, personnel and organisational issues, market issues and information issues

The final phase of the programme is fundamentally different from the first two phases of the programme, although it follows from them. In the third phase, the programme goes live, and the real risks, and rewards, can be taken. The reports produced by the Management/Specialists are put forward for implementation in the organisation. The procedures for implementation will be specific to the report, and to the organisation or sector.

Project re-appraisal should take place after sufficient time has elapsed to enable valid conclusions to be drawn, but not so long that the objectives of the programme have become overtaken by new developments. Depending on the scope of the programme, the review could take place as soon as three months after implementation. The review will resemble the initial organisational study with which the programme began, and provides the baseline against which to measure any change arising from the programme.

Lithuania: training located within enterprise structure

Another locus for training is a single enterprise. In Lithuania in 1996 project-based learning and on the job training programmes have been used extensively in association with study visits to the UK and some distance learning while assisting a state enterprise to restructure to meet the intense competition resulting from rapid liberalisation of the market for petroleum fuels. Here the concerns have been most localised, and most intense. The survival of ministries and large training institutions is assured in spite of economic transition. The survival of a single enterprise is by no means certain. Consequently the programme was as much concerned to equip individuals for life outside the organisation in the marketplace, as it was to help the organisation as a whole to adapt.

CREATE – an update

by John Rodway, Education and Training Officer, CREATE

In its early years, CREATE took an orthodox view of assistance for the classroom teacher. However, the CREATE team realised that simply improving education about energy was of limited value because it did not affect pupils' attitudes or actions. True education is more than memorising facts. Young people need the opportunity to put what they understood into practice in ways that are relevant to them.

To this end, CREATE has become increasingly involved with bringing together the three disciplines that deal with energy – education, technology and management (including finance). This trio has been joined by a fourth, broader theme - concern for the environment. An exciting synergy is emerging between these traditionally distinct methodologies. The combination is raising the profile of energy in schools, colleges and the communities that they serve. For those that enjoy acronyms, this "whole school approach" can be dubbed SHAME – the School's Holistic Approach to the Management of Energy

Here are some examples of CREATE's expanding portfolio of activities that support this concept. It has:

- contributed to the writing of Building Energy Efficiency in Schools: a guide to a Whole School Approach - teacher-orientated advice on school energy management from BRECSU.
- written Energy for a Sustainable Lifestyle - one of a series of booklets to support the Eco-Schools award. Eco-Schools is a European scheme for recognising the good environmental practices carried out within school buildings and grounds that involve their pupils. Effective energy management is one of the categories to be assessed.
- contributed the section on energy in Our world - our responsibility: Environmental education - a practical guide prepared by a consortium of organisations led by the Council for Environmental Education and the Royal Society for the Protection of Birds, launched last July by John Gummer, the Secretary of State for the Environment.
- given advice during the compilation of Teaching Environmental Matters through the National Curriculum - the latest guidance to teachers from the government's School Curriculum and Assessment Authority.
- undertaken the management of the Energy Cashback scheme on behalf of the Energy Saving Trust. This is a £2.5 million, three year programme for rebates to help schools upgrade the energy efficiency of their buildings and systems. Pupils must be involved in the process.
- co-ordinated the production of two computer programs that help pupils calculate scores for domestic energy efficiency. Save Your Energy! is aimed at upper junior and lower secondary pupils, while Starpoint for Students is targeted at the 14 to 19 age range. Both encourage users to investigate the effects on the score of making changes to buildings and to prioritise improvements within limited budgets.
- helped Philips Lighting to compile the EEL Pack - to update the understanding of teachers in secondary schools of recent developments in energy efficient lighting technology. It suggests activities to help transmit this information to students and encourage them to apply their understanding at school and home.
- given encouragement, advice and practical assistance to partnerships between statutory, commercial and non-governmental organisations. These are often co-ordinated by local authorities. Most involve pupils in investigating energy and its management, recommending improvements, and then monitoring and evaluating performance. Schemes in Staffordshire, Nottinghamshire and Croydon are prime examples.
- responded to requests from many local authorities on the implementation of the Home Energy Conservation Act (1995). The Act requires local authorities to sample survey the energy efficiency of all housing stock in their areas and submit plans to reduce energy consumption by 30% over 10 years. The Department of the Environment's Guidance Notes on the Act stress the variety of roles that young people can play and the educational benefits that they can derive from properly co-ordinated schemes.
- made presentations to local authorities, education inspectors and advisers, groups of teachers, professional institutions and commercial organisations. CREATE has also staged displays at national, regional and local conferences, exhibitions and conventions.
- established its own site on the Internet (http://www.create.org.uk). This will provide teachers and their students with a growing range of up-to-date information, ideas and statistical data, together with links to other web-sites dealing with energy. If Members know of, or their companies have, a web-site of potential value to schools, then CREATE would like to know about it (E-mail: info@create.org.uk).
- forged links with kindred organisations across the European Union.

The Centre for Research, Education and Training in Energy was established as a registered charity in 1988 by the Institute of Energy, the then Department of Energy and several industrial companies. Its remit was to discover and encourage the best practices in energy education. There have been several significant changes since 1993 when the last article on the activities of CREATE appeared in Energy World.

To support this increasing work-load, CREATE has expanded and diversified its specialist staff. Over the last three years, its team has grown to includes people with proven expertise in teaching, home economics, marketing, writing and engineering. CREATE has being specifically recommended in several government publications and received public praise from Cabinet Ministers.

Admiration is backed by hard cash. CREATE's core funding is currently provided by the Department of the Environment through the Energy Saving Trust. This is supplemented by donations, grants and commissions from a range of commercial and professional bodies, including the Institute of Energy.

However, there is a great need for people with engineering experience, such as Members of the Institute, to assist individual schools with improving energy education and/or their energy management. As mentioned in the previous issue of Energy World, the Institute has commissioned CREATE to prepare an information pack which will show how Members can use their professional expertise to enhance the education of young people.

Copies should be available in late Autumn. Both they and further information on any of the items mentioned in this article and how they inter-relate are available from:

- CREATE, Kenley House, 25 Bridgeman Terrace, Wigan WN1 1TD
  Tel: 01942 322271. Fax: 01942 322273

Management qualifications by distance learning – a personal perspective

by Kathryn A Houghton MA (Oxon) DMS CEng MInstE

Gone are the days when an engineer could survive and prosper without knowledge of finance, legislation and management theory. The rapidly changing work environment means that an engineer may now have to manage a multi-disciplinary team of accountants, engineers, and marketing staff. Unfortunately, most of the traditional engineering degrees leave graduates ill equipped to assume this role.

This was the situation I found myself facing in 1990, two years after graduation from Oxford University with a degree in Engineering Science and working as a Third Engineer for National Power in Oxford. Whilst gathering the experience and qualifications necessary to gain my Chartership I found that the profession was changing. Managing a team of people and high finance projects needed more than Ohm's Law and digital circuit theory – I realised that I required a recognised management qualification to enhance my career prospects. I decided upon the Diploma in Management Studies (DMS), a widely recognised qualification which had stood the test of time.

The logistics of obtaining the qualification became more difficult. Once I had decided upon the DMS I had three options. The first was to take a full-time course giving up a reasonably well paid job (with no guarantee of obtaining another one afterwards) and no means of supporting a mortgage. Second, I could have taken a day release course at the nearby Polytechnic. After exploring this option with my employer we decided this was impracticable. Staff reductions and increased workloads meant that having an engineer off site for a day would have put excessive strain on the department. I would have also been expected to work back the time off, leaving little time for study at home. I therefore chose the third and final option - distance learning.

I had no previous experience of distance learning, but after some research into the available courses found one which fitted well with my career. The course was administered by Wolsey Hall, Oxford and taught by tutors from the Buckinghamshire College of Further Education, now part of Brunel University.

It is worthwhile investing some time and effort in finding a course that meets your needs. Distance learning management courses vary in their structure and content, but the majority have a large element of unit-based private study with continuous assessment in the form of regular assignments. There may be a requirement to attend a short weekend study period which includes elements such as business games and presentations, and these often form part of the final assessment mark.

There were several educational prerequisites for the course and the fees for the first year were £1,200. This was more than the alternative day release option, but a lot less than some one week courses I send my own staff on now. I had to fund the fees myself on the understanding that, if I was successful in the first year, the second year would be sponsored by National Power. The college did offer interest free instalments which helped to spread the cost.

The course started in January 1990 with a day at St. Catherine's College, Oxford at which we met the other students, some 100 in all. This gave me an opportunity to talk to, and form study groups with, students from the same geographic region and also those who worked for the same company as myself. We also were able to meet the tutors who had written the course materials and who would be marking the assignments.

At the end of the meeting we were issued with our first assignment and were given a realistic date for completion together with a timetable to enable us to plan the target dates to complete the first year. The assignment was in the form of a course book and a unit book with plenty of self assessment exercises, and after studying these we were required to complete a 3,000 to 4,000 word essay.

During the first year the units form the foundation of the management training. The following units were studied, all compulsory:

- management theory and practice
- accounting
- marketing
- organisational behaviour
- quantitative techniques
- business law.

Two study weekends were held, which were conveniently local for me but some others did have to travel long distances to attend. If travel could be a problem for you, it is worth enquiring where study weekends are going to be held before signing up for a course. The weekend gave students an opportunity to meet up with their tutors and discuss specific problems.

The main event of the weekend was a business game which, besides being highly enjoyable, also enabled us to put some of the theory into practice in a safe environment before trying them out at work. The opportunity to 'teamwork' with students from a wide range of professions, such as accountancy and law, meant that I gained entirely new perspectives on problem solving.

The marking scheme for the first year's assignments required a minimum score of 40% on each assignment, and a mean score of 50% for all six, before moving on to the second year. The tutors could not have been more helpful. We were given their addresses and telephone numbers and times at which they could more easily be contacted. I always had my telephone messages returned and the tutor always had time for my problems no matter how simple they seemed.

Nonetheless, distance learning does require strong self motivation. There was a high drop out rate – indeed, by the end of the first year half of my study group had either deferred their studies or stopped them entirely. I was fortunate enough to have an atmosphere at home conducive to study. I studied at home in regular one or two hour sessions and even sometimes took the books on holiday to complete assignments in time.

The second year was more challenging. A number of assignments had to be completed including:

- financial management
- marketing management
- information technology
- management of operations
- managing people
- strategic management
- two optional units chosen from: financial strategy, international marketing, marketing of services, personnel management, industrial relations and management science.

- a 10,000 word dissertation
- two assessed weekends with team work and business games.

All of this had to be combined with revision for three examinations at the end of the year. I found it difficult to devise a dissertation topic which related to my work at National Power and ultimately I decided upon a study on marketing in the confectionery industry, inspired by some work I had done during the Marketing Unit. I aimed to complete my dissertation before the final examinations, although this wasn't a necessity, as I suspected that afterwards it would be more difficult to find the motivation to complete it. I got tremendous help from companies within the industry with my dissertation, and I had arranged to have access to a local management library for searching out references. With hindsight, it turned out to be an advantage to write a dissertation that was not immediately related to my day-to-day work as the change of subject helped to maintain my interest.

Following the examinations there was a three month wait for the results, during which time the results were checked by external examiners and sample work inspected. Finally, I received a telephone call early in 1992 asking me to attend for an interview with the external examiner – I was on the borderline of a distinction pass. This was nerve wracking as he delved into the depths of a dissertation that had been completed six months previously.

To my relief, I passed with distinction. I also obtained Chartership with the Institute of Energy in the same year and promotion to second engineer with East Midlands Electricity, followed by subsequent promotions in later years which were largely due to my experience and qualifications in both engineering and management.

Distance learning has advanced since I studied for my DMS with the wider availability of the Internet and electronic mail students. There is now the potential for distance learning students to interact more easily with their peers and tutors - I recall trying to sort out the problems with complex spreadsheet calculations by telephone with a (thankfully) very patient tutor. The Open University, a pioneer in many ways with distance learning, has already introduced courses with involve teaching via the Internet.

The future for distance learning looks promising, with advances in technology enhancing the learning tools available to the student and making the physical distance between tutors and students increasingly less relevant. There are many advantages to distance learning (see Table) for both students and their employers, and we are likely to see continued growth in this method of training over the years ahead.

The author

Kathryn Houghton joined Rolls Royce (Aero Engines) Ltd in 1984 as an undergraduate engineer. She gained a degree in Engineering Science at Oxford University in 1988 and joined National Power Plc in 1989 as a control and instrumentation engineer. In 1992, after completing a Diploma in Management Studies and achieving Chartership with the Institute of Energy, she joined East Midlands Electricity Plc as a second engineer. She has recently been promoted from Control Systems Manager, enhanced first engineer, to IS Project Manager.

A permanently sustainable energy strategy

by Professor M W Thring

Professor Thring argues that unless we, in the countries that have grown accustomed to the use of cheap energy, can change at least halfway towards a system that can be permanently sustainable by about the middle of the next century, the whole world will become uninhabitable before the year 2100.

There are three reasons why disaster lies ahead.

First, we are inflicting irreversible damage to the ecosphere. Rising levels of atmospheric CO2 and CH4, acid rain, forest destruction, exhaustion of aquifers and clean water supplies, soil loss by salination, erosion, mining and concrete deposits, dangerous artificial radioactive elements (eg Pu, Cs, I, Sr), pesticides and eutrophication in water, the destruction of species (both directly useful or "merely" part of nature) are all the results of our activities. These are already harming us physiologically and psychologically, and will inevitably harm our descendants catastrophically, if we continue with these practices for another two or three decades.

Second, violence on a personal and group scale is growing in many places in the world, while the use of energy has made destruction 10,000 times easier than it was for any previous destroyers. This violence results from short term group-oriented decisions which cause escalating envy between groups, rising unemployment and loss of job satisfaction and of sense of serving a useful purpose in life.

Third, the world financial system grows

ever more precarious to information errors, swindles and collapse of confidence.

The industrial revolution has given us, in the west, many good things: plentiful food, clean water, hygiene and sanitation, near-universal education, comfortable homes. Unfortunately it has also taken us on the path towards these disasters.

The conditions for permanent sustainability can be listed as follows:

1. All adults must have the opportunity to earn by doing decent work the benefits of the industrial revolution for themselves and their children. This condition is essential to avoid jealousies leading to violence, and misery due to lack of feeling of being useful.
2. Humanity must come into permanent stable equilibrium with the environment. We have to find a compromise between the essential needs of humanity and those of a stable ecosphere, which requires the preservation of species variety, wilderness, forests, coral reefs, and no residual chemical or radioactive pollution of air, land or sea. We can call the engineering needed for this "Equilibrium Engineering". If we assume that universal education and security leads to the world population levelling off at 8,000 million, then we have to grow enough food for this number on a permanent basis, and make available enough energy for everyone to have access to all the essential benefits of the industrial revolution.
3. We have to bring down the transfer of fossil carbon into the atmosphere to a rate which will restore the carbon dioxide of the atmosphere to its value of a century ago. As a basis I will assume that this requires the reduction of the world total fossil carbon dug up and put into the atmosphere to one-third of the present rate. All other energy needs will have to be provided by renewables. Eventually all fossil fuels will have to be replaced by renewable energy, but for the present argument we will assume that accessible oil, gas and coal will be available for some centuries if they are used at this lower world rate. They will, of course, become more expensive to win as the easiest ones are used up.

How do we use Energy now?

Figure 1 shows the energy consumption per capita against the GNP/capita in various countries for the years 1964, 1974, and 1984. This was kindly prepared by Alan Dunsmuir working with Shell. These show the great difference between different countries in the west such as Japan and Canada, as well as the enormous gap between the countries of the south and of the West. The sharp upward rise of energy/capita in some countries of the south is a result of inefficient use of fuel in the early stages of industrialisation, when the increase in consumption is at a rate similar to that in the early stages of industrialisation of the west.

Table 1 gives the world and OECD use of commercial fuels expressed as btoe/year (billion = 10^9 tonnes oil equivalent per annum) for 1990. The total world use of all energy in that year was 8.3 btoe.

Stage 1: Good Housekeeping.

How can we reach a situation in the next 50–60 years, with a two-thirds reduction in the present world total CO_2 emissions from fossil fuel, in which the 4,000 million people of the third world increase to 8,000 million and move towards a life with all the essential benefits of the industrial revolution?

A recent Shell Study (*Evolution of the World's Energy System 1860–2060*) considers two scenarios, Sustained Growth (SG) and Dematerialisation (D). Both are based on the assumption that the world population will reach 8.5 billion by 2030, 10 billion by 2060 and that world economic growth will continue at 3% pa until 2060. However, they treat the world as one unit, which fails to take any account of the facts shown in Figure 1 and Table 1.

In SG the total world consumption of energy will rise by 2% pa to become treble the present figure by the year 2060, with identified renewables providing nearly 40% of this: "By 2020–30 the use of fossil fuels will no longer contribute to growth, being limited by the rate of production and commercialisation of resources being economically competitive with renewable energies". The carbon emitted to the atmosphere will rise from the present figure of about 7 billion tonnes a year to 11 billion.

The D scenario involves an improvement in energy intensity (ratio of energy consumption to GDP) of 2% pa, but with the same increase of 3% pa in GDP. Carbon emissions rise to 10 bt/year in 2030 and then falls, as renewables develop, to 9 bt/year by 2060. The genuinely permanent renewables (solar, wind, biomass and mini-hydro) would be providing only some 30% by 2060, as this scenario, like the SG, is based on all decisions being made purely on economic grounds.

The scenario called for by the International Panel on Climate Change requires a carbon emission falling from the present figure to just under 4,000 mt/year by 2050 where it levels off. However, it seems likely that to ensure avoiding the consequences of the greenhouse effect we need to bring the total world emission of carbon from fossil fuels down to one-third of the present figure to give a figure of 2.5 bt/year (2.8 btoe/year) for the value which will ensure a decent climate for our descendants. This would imply that the D scenario would require by 2050/60 the provision of 9.2 btoe/year of renewables. The SG scenario would require a global supply of 13.2 btoe/year of renewables by 2050/60.

The Good Housekeeping scenario which I regard as essential if our descendants are to inherit a decent world is based on the following assumptions:

1. By enabling all humans to earn a decent living, the world population will level off at 8 billion before the year 2050.
2. The world total emission of fossil carbon will be one-third of the present value.
3. The total world use of energy (fossil and renewable) rises only to 10 btoe/year.
4. The total OECD energy use falls to less than half by the intensive application of energy economy. The OECD population is assumed to remain at 1 billion, so that the total energy per capita is 2 toe/capita per year.

The total energy use of the rest of the world is assumed to rise to 8 btoe, so with a population of 7 billion, they will be using only 1.14 toe/capita per year. Thus they will have already reached the level of energy use corresponding to Equilibrium Engineering, discussed in the next section.

Tables 2a and 2b refer to the situation to which the Good Housekeeping stage could bring us by the middle of the next century. They both show the consequences of limiting the world use of fossil fuels to 2.8 btoe/year, and using enough renewables to bring the total up to 10 btoe/year. Table 2a is based on the assumption that the OECD still uses half the permitted fossil fuel, while in 2b it is assumed that the fossil fuel per capita is the same in all the world.

The figures for 2050/60 are obviously only rough suggestions but they do show clearly how much the wealthier peoples will have to reduce their fossil fuel consumption if the world is to remain inhabitable. This they will have to do by a combination of fuel economy (obtaining essentially the same benefits with less than half the present energy usage) and installation of equipment for renewables. The use of energy for transport of goods and people would have to come down to a very small fraction of the present figure.

The renewable energy systems – solar, wind, wave, mini-hydro and micro-hydro, all the biofuels (biogas, coppiced timber, rape and other oils, ethanol and methanol) do not add to the CO2 content of the atmosphere from mineral carbon. Hence we can regard them as available to an extent which is limited only by our choice of how much fossil fuel we invest in the equipment for them. They have a further advantage that they can be used in remote areas where fossil fuels are not affordable for financial and transport reasons.

It follows clearly that reliance on purely economic considerations will not provide a

decent world for our descendants, and that as a matter of urgency we should embark on the first stage of caring for them. I call this the Good Housekeeping stage, because it involves putting our own house in order and helping our neighbour - the world's poor. It involves provision by national governments and international organisations of a mixture of "carrots" (eg tax rebates, long term loans and employment grants, similar to the past support for nuclear energy) and "sticks" (regulations) to accelerate three processes. The situation should be looked upon as similar to a war situation when rationing is accepted as a necessity; we need what William James called "a moral equivalent for war". Perhaps one can hope that the danger to our descendants can replace the personal fear we felt in the war?

The three processes are:

1. Financial encouragement for investment in development and installation of equipment for renewables, mainly on the domestic and village scale: solar, wind, wave, coppiced wood, forestry trimmings, ethanol, methanol, agro-diesel, mini-hydro. Development of complete city waste sorting systems in which all compostible materials go with sewage to biogas plants.
2. Financial encouragement for fuel economy and pollution avoidance systems. Long term loans to enable all cities to install CHP for domestic and industrial purposes, by modernising existing coal fired power stations. The economy in electricity will cause a tremendous reduction in CO2. Domestic and industrial insulation. 120 mpg cars. Improvement of public transport to the point where own-car trips are less convenient for nearly all journeys, and most goods go by rail.
3. Assistance to developing countries to install and maintain village scale renewable energy systems.

Stage 2: Equilibrium Engineering

The Good Housekeeping stage is essential to avert the immediate dangers of the greenhouse effect and other pollution, but it still does not avert the other two looming disasters: violence caused by jealousy, hatred and feelings of uselessness, and the collapse of the economic edifice based on transport of money, employment, tourists, foods, minerals and timber around the world.

If we can envisage a world in which everyone has the opportunity to earn the requirements for a self-fulfilling life then we can talk of permanent sustainability. The technological basis of such a society can be called Equilibrium Engineering

This second stage must start well before the end of the first, but the best prospect for our descendants is that it should be substantially complete by the end of the 21st century. This can only happen if the fact, told to us by our conscience, that the quality of our life and of those of all others is an infinitely better criterion of success than the acquisition of wealth, becomes widely recognised.

The change to Equilibrium Engineering necessarily goes against the short term desires of those who are already using plenty of energy: it requires further fuel economy and sacrifice of things to which we have grown accustomed. I have seen the appearance of many of these in my lifetime, often with a clearly visible deterioration of human quality of life. How can we get these 'sacrifices' accepted by the rulers of a democracy?

In my book "*The Engineer's Conscience*" I made a clear distinction between Quality of Life (Q) and Standard of Living (S). Quality of Life is the gut feeling that one will come to the end of one's life leaving a world slightly better than one found it: that one's life has not been wasted or harmful. I showed that, both for an individual and for a society, as S rises from zero, Q at first rises up to the point where one has enough of everything for a self-fulfilling life and then steadily falls as the desire for conspicuous wealth, luxury and physical laziness swamps the desire for self-fulfilment through creative efforts.

Figure 1 has shown how closely S is related to the energy consumption per capita. Thus this implies that the reduction in energy per capita of the wealthy which is essential for the good of our descendants can actually bring a rise in our Quality of Life.

Figure 2 illustrates this point diagramatically. This shows the relation between Q and C. C is the total energy consumption (renewable and fossil) measured as toe/capita per year. EE is the band of energy consumptions which are fully consistent with Equilibrium Engineering in which humanity lives in permanent stable equilibrium with the ecosphere. LL is the range of lowest energy levels consistent with a full life: 0.3 to 0.5 toe/capita per year (see Appendix).

If we suppose that the use of five times the minima calculated in the Appendix can be sufficient for the requirements of a full human life then we have upper limits to the amount of energy per capita which must be supplied namely 1 to 1.5 toe/capita per year.

UL is this range of upper levels of energy consumption above which the system is unsustainable. Of this no more than 0.35 toe/capita per year can be fossil fuel.

The line marked survival level is the value

Table 1: The present situation

	Population (billions)	Total energy consumption (btoe/year)	Energy/capitaper year (toe/ capita per year)
OECD	1	4.2	4
Rest of the world	4	4.1	1
Whole world	5	8.3	1.7

Table 2a: Good Housekeeping scenario, 2050–2060. OECD using half fossil fuel

	Population (billions)	Total energy consumption (btoe/year)			Energy/capitaper year (toe/ capita per year)	
		Fossil fuels	Renew-ables	Total	Fossil fuels	Total
OECD	1	1.4	0.6	2	1.4	2
Rest of the world	7	1.4	6.6	8	0.2	1.14
Whole world	8	2.8	7.2	10	0.35	1.25

Table 2b: Good Housekeeping scenario, 2050–2060. OECD using as much fossil fuel as others

	Population (billions)	Total energy consumption (btoe/year)			Energy/capitaper year (toe/ capita per year)	
		Fossil fuels	Renew-ables	Total	Fossil fuels	Total
OECD	1	0.35	1.65	2	0.35	2
Rest of the world	7	2.4	5.6	8	0.35	1.14
Whole world	8	2.8	7.2	10	0.35	1.25

Note that these figures only show the orders of magnitude of the various scenarios.

of Q below which life is not worth living because there is no sense of self-fulfilment and people opt out by alcoholism, suicide and drugs, or resort to crime and violence.

PE is Primitive Engineering; RE is Rural Engineering; CE is Conventional Engineering – this is the path the industrial revolution has followed. This has turned into OE: Overgrown Engineering, where developments are decided primarily to maximise dividends (wealth creation) and no longer for the benefit of the public which was the original aim of engineering. The countries of the west, with their consumptions in the range 3 to 6 toe/capita per year, are sliding down the path towards the minimum survival level of Q

To get to a stable world the west must move back along the path IE (Industrial Engineering) until they come into the range of EE. At first the necessary "sacrifices" may cause an apparent fall in Q, but as the idea that Q is a better measure of success than C spreads, Q would rise towards a value considerably higher than that in our present society.

This calculation is of course very approximate, but it does suffice to show us how urgent it is to invest in renewables both for ourselves and for the poorer regions of the world. It is essential that we stop using the immediate financial profit as the criterion for a project and consider at least equally the long term world-wide consequences.

Equilibrium Engineering must be reached by the end of the 21st century if our descendants are to live in a habitable environment. This can only happen if, during stage 1, the idea that one judges one's own and other peoples' success in life by quality rather than wealth, has percolated everywhere.

Equilibrium Engineering would be characterised by the universal human right to earn a decent living by doing a decent job. It would require the development of an Equilibrium Economics in which the aim was no longer to maximise shareholder profits but merely to ensure that everyone could find work locally which would both feel valuable and ensure that enough of all the essentials for a good life were available. It would not involve any commuting, or "3500 km yoghurt pots" and communities would be small enough for everyone to know everyone. Farms would be family smallholdings, since history shows that this is the only system where the land is properly looked after for hundreds of years. Long distance travel and transport would become rare.

In my view the most important study for all university departments is the "history of the future" – to work out how humanity could reach this stable world, and what its characteristics would be. Certainly fuel technologists have a key role in both stages, to provide, fully sustainably, all the energy every human needs for an optimum Quality of Life.

Appendix

How much energy is essential for a decent life?

I have made (Appropriate Development for Basic Needs, p15. 1991 ICE London) an estimate of the energy needed to bring the essential benefits of the industrial revolution to the inhabitants of an African village, such as the one in Tanzania with which Michael Carey has been working for twelve years.

This calculation suggests that all the essentials for a healthy, educated self-fulfilling life could be provided by some 30 W/capita (260 kWh/capita per year) of electricity and about 0.12 toe/capita per year. If the electricity is made from fuel with an efficiency of 30%, then the total requirement becomes 0.2 toe/capita per year, and we should allow another 0.1 toe/capita per year for heating for those people living in a cold climate, making a total of 0.3 toe/capita per year. To provide a small margin over these figures the values of LL in Figure 2 have been taken as 0.3 to 0.5 toe/capita per year.

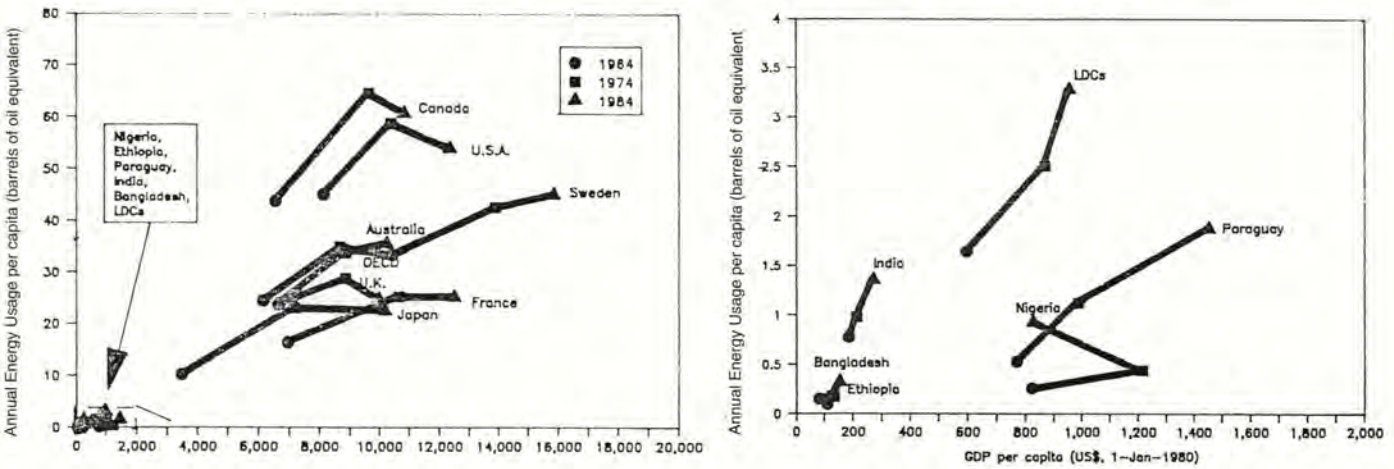

Figure 1: Annual per capita Commercial Energy Usage and GDP for a Selection of Developed and Less Developed Countries in 1964, 1974 and 1984.

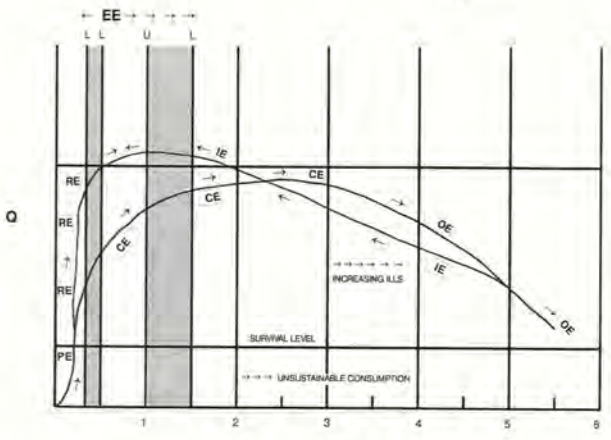

Figure 2

TEMOL meets the Standards for Managing Energy

Readers of Energy World will, by now, be familiar with TEMOL - Training in Energy Management through Open Learning - the Institute's open learning programme which, in its second year now has over 60 students working towards the Certificate of Competence in the Fundamentals of Energy Management.

As a brief reminder the course contains 360 hours of material which includes a 100 hour project based on a problem solving exercise in the workplace. There is no final exam - simply seven assignments and the completion of the project work. It is a practical and employment focused course with full tutor support. The student network keeps in touch via the TEMOL Times newsletter as well as directly with each other to remove the 'distance' often associated with similar programmes. Tutors also have their own network to discuss TEMOL issues with each other.

Those of you who recall earlier articles on TEMOL may remember that it's development was funded by the Department of the Environment's Best Practice programme and the EU SAVE programme with the intention to be the recognised training material to complement the Standards for Managing Energy. However, delays in the production of the Standards meant that TEMOL was launched more than 12 months in advance of the final version of the Standards. Although this has given many of the TEMOL students a head start towards gaining knowledge and understanding required for the Standards, it has also provoked the Institute to undertake an essential mapping and cross referencing exercise between the TEMOL materials and the latest published version of the Standards for Managing Energy.

The Institute is pleased to announce that, as a result of concluding this exercise, only minor additions in the form of references on health and safety and energy legislation need to be added for a complete correlation with the Standards. This is being completed as Energy World goes to press.

At this point it would be useful to reiterate the process of training and development through to formal recognition and how TEMOL fits with the new Vocational Qualification Units in Managing Energy which are currently being piloted through a DoE Best Practice programme project in partnership with the Institute and the University of Oxford Delegacy of Local Examinations.

The standards form the basis for Vocational Qualification Units in Managing Energy. To obtain each unit you must prove competence at each of the tasks described within the unit. You do this by demonstrating knowledge and understanding and collecting evidence for a portfolio which is then assessed against the unit for certification.

The process for obtaining VQ unit certificates and products that can assist you include:

More information about VQ units in Managing Energy will be published later in the year, but in the meantime if you would like further information or have your questions answered please contact the Institute of Energy and ask for Louise Evans or Louise Collins.

Development Path	Product
Assess current competence against the Standards to identify training requirements to gain knowledge and understanding	CPD Manual in Managing Energy
Fill training needs for knowledge and understanding	TEMOL course
Register with Delivery Centre for VQ unit certification	IoE is Delivery Centre
Gather portfolio of evidence to prove competence in the workplace	TEMOL 'live' project work and product and observational evidence from the workplace
Portfolio and candidate assessment	Assessor supplied by Delivery Centre (The Institute of Energy)
Achievement of VQ unit certificates in Managing Energy	Certificate from IoE and UODLE

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The nearest Underground stations are: Great Portland Street and Regents Park; both stations just a five minute walk away. Oxford Circus and Warren Street are only a ten minute walk. The nearest rail terminus is Euston, a 15 minute walk away from the Institute.

For information on rates and availability, please contact Derek Smith at the Institute. Tel: 0171 580 7124. Fax: 0171 580 4420.

What has the Institute done for me lately?

As a graduate fresh from university I naively believed that my degree certificate would lead the way to a sparkling career. However, I was unsure what type of career would be the right one for me.

I sought advice from various university careers services and employment agencies. They were all helpful but their knowledge of my field was limited. I felt I was going in the wrong direction but had no-one to ask. From the numerous applications I sent off I did get some good responses but I didn't find the job I wanted. While I was prepared to wait for the right job to come up, I was at the same time aware of the time ticking away and that soon a new set of graduates would be joining the hunt. I was also acutely aware of my lack of industrial experience and how this might hinder my chances of getting the job I wanted.

At this point I was contacted by a member of the North West Branch of the Institute of Energy. I had joined the Institute in the final year of my degree course at Leeds and, apart from the monthly delivery of *Energy World*, I had had no contact with the Institute. I was completely unaware that there was a North West Branch. Nevertheless, I was invited to attend a committee meeting the following week. I was in two minds about going, but did, and it turned out to be the right decision. The members all made me feel welcome and, having listened to my situation, they were very keen to give a helping hand. With their wealth of experience they were able to explain exactly where I was going wrong, what jobs to go for and the right people to contact.

Within a matter of days I had an interview with AEA Technology in their process and petroleum department for a position as a risk assessor. The committee members even set up a mock interview for me asking the type of questions I would be likely to face.

I got the job and have now been working in Warrington for the past few months. I have enjoyed every minute here since I started and would like to take this opportunity to the members for their help and for electing me vice secretary of the Committee.

Matthew Cropper

North West Branch Annual Dinner

The 1996 Annual Dinner of the North West Branch of the Institute was held, as it has been in recent years, at the Haydock Thistle Hotel.

Yet again the number attending was increased over previous years to over 150 members and guests. The guest of honour was the Rt Hon the Baroness Chalker of Wallasey, Minister for Overseas Development, who addressed the assembly on the different energy needs of developing countries. The Institute President, Dr David Jeffries, responded with a warm appreciation on behalf of the members.

The Branch Chairman, Mr Steve Pathmarajah, ending a very successful two year term of office, proposed the toast to the guests and entertained us all with his inimitable humour. Mr Mark Baker, Chairman of Magnox Electric Plc, replied amusingly on behalf of the guests.

After enjoying good wine, food and being well entertained the members and guests passed the remainder of the evening in relaxed conversation, with everyone looking forward to an equally enjoyable and successful event next year.

M Cogan
Deputy Chairman, North West Branch

CPD - More than just an acronym

Continuing Professional Development helps you to define your goals and ambitions, track your progress and achieve recognition for your efforts. The Institute's Career Management Planner is designed to do just this, aiding you to keep up to date with developments in your field of work, be aware of career opportunities and take part in activities to broaden and enhance your personal qualities and skills. The Institute of Energy supports the published policy of the Engineering Council and considers that members should undertake CPD activities for a minimum of 35 hours per year (5 days). CPD activities include formal courses, meetings, conferences, private study, distance learning, writing and presenting technical papers and various others. This will assist you when you wish to transfer your membership to a higher grade. Priced £12.50 for members of The Institute of Energy or £15.00 for non members, this is a must for anyone who wants support and guidance in developing their career.

For a leaflet and order form contact the Education Secretary at The Institute of Energy: Tel 0171 580 7124 or fax 0171 580 4420

Branch events

September 1996

Northern Ireland
Tuesday, 24 September
"Wave Power" a joint event with RINA/IMarE to be held in Kirk McClure Morton, Boucher Rd.
Contact Mr P Waterfield, tel: (01232) 364 090

North West
Wednesday, 25 September at 6.00 p.m.
CPD Lecture, Mr Willets, AEA, Thompson House, Risley.
Contact Mr E Curd, tel: (0151) 625 6744

North West
Sunday, 29 September
Sunday Lunch and wine tasting at Banks Bistro, West Kirby. Tickets only.
Contact Mr E Curd, tel: (0151) 625 6744

October 1996

Scottish Branch
Tuesday, 1 October
Site Visit to St Boswells Biomass Installation.
Contact Mr R Loudon, tel: (0141) 332 4153

Head Office & Northern Ireland
Tuesday, 8 & Wednesday, 9 October.
"The Energy Show 96"
The Institute is exhibiting on both days. To be held at the Burlington Hotel, Dublin.
Contact Louise Collins, tel: 0171 580 0008

The Combustion Engineering Association
Wednesday, 9 October
"Emissions from Combustion Plant III"
Speakers include Dr L Hales, Head of Technical Guidance Branch, HMIP. In association with The Institute of Energy, the CEA are running a one day conference to be held at the Moor Hall Hotel, Sutton Coalfield
Contact Mr D Suthers, tel: (01685) 879119

Midland
Thursday, 10 October 1996
"Intermediate Technology in the Third World" by Mr R Holland, Managing Director, Intermediate Technology Consultants Ltd.
Contact Mr M Round, tel: (0121) 422 5311

London and Home Counties Branch
Tuesday, 15 October 1996, 6.30pm
"Global Warming is cased by the hole in the ozone layer isn't it? So why do I need to turn the lights off?" Joanna Wade - Association for the Conservation of Energy - Imperial College, Room 208, Imperial College Road, London SW7.
Contact Mr PM Johnson, tel: 01793 893330

North East
Wednesday, 16 October, from 12.00pm
" Energy Management in Hospitals" by Mr D W Philliskirk to be held at Wansbeck Hospital, Ashington
Contact Mr A Potts, tel: (01670) 712861

Northern Ireland
Wednesday, 16 October
"Environmental Assessment and Impact Studies" Venue to be confirmed.
Contact Mr P Waterfield, tel: (01232) 364 090

North West
Thursday, 31 October at 6.00 p.m.
"The Work of ETSU", Dr N A Prattern at AEA, Thompson House, Risley.
Contact Mr E Curd, tel: (0151 625 6744)

Northern Ireland
Date to be confirmed
Student Evening, to be held at the University of Ulster, Jordanstown.
Contact Mr P Waterfield, tel: (01232) 364 090

November 1996
Northern Ireland
Friday, 1 November, 6pm
"Renewable Energy" presented by Dr Mary Archer. To be held at the QUB Ashby building.
Contact Mr P Waterfield, tel: (01232) 364 090

Midland
Thursday, 7 November
"BNFL and the Nuclear Fuel Cycle" by Mr N Griffin, BNFL Ltd.
Contact Mr M Round, tel: (0121) 422 5311

London and Home Counties Branch
Thursday, 7 November, 6pm
"Environmental Issues in Sainsburys" Allison Austin, Senior Manager Environmental Affairs - J Sainsbury Plc, Rennie House, Stamford Street, London SE1 9LL.
Contact Mr PM Johnson, tel: 01793 893330

Scottish Branch
Tuesday, 12 November
Site Visit to Osprey Wave Unit, Clydebank.
Contact Mr R Loudon, tel: (0141) 332 4153

Midland
Friday, 15 November
Annual Dinner and Dance, to be held at the Belfry Hotel, Wishaw, nr Sutton Coalfield.
Contact: Mr M Round, tel: (0121) 422 5311

North East
Tuesday, 19 November, from 5.30pm
"Energy Efficient & Low NOx Shell Boilers", by Mr Ken Tidd, Wellman Robey Ltd, to be held at Newcastle University, Merz Court, room L101.
Contact Mr C Howarth, tel: (0191) 222 6000

North West
Wednesday, 27 November
"Ozone Treatment of Water", Mr D Wittingham of Thermelec.
Contact Mr E Curd, tel: (0151) 625 6744

December 1996
Head Office
Tuesday, 3 December & Wednesday, 4 December.
"NEMEX" Louise Evans will give a presentation regarding our current initiatives. Plus, for those who have gained NVQ unit certificates in Managing Energy on our pilot programme, certificates will be awarded. To be held in Birmingham, Metropole Hotel.
Contact Louise Collins, tel: 0171 580 0008

London and Home Counties Branch
Tuesday, 3 December, 6pm
"Labour Party Energy Policy" John Battle MP at The Royal Institution. Contact Mr PM Johnson, tel: 01793 893330

Scottish Branch
Tuesday, 3 December
Site visit to Longannet Power Plant.
Contact Mr R Loudon, tel: (0141) 332 4153

Head Office
Tuesday, 10 December
"Biomass-A new Energy Source for Heat & Power."
One day conference organised jointly by The Institute of Energy and the Solar Energy Society
To be held at the Linnaen Society, London., from 9.30am.
Contact Louise Collins, Tel: 0171 580 0008

Midland
Thursday, 12 December
"Used Oil-Waste or Treasure" by Mr R Sturdy, Chief Executive, Greenway Holdings plc.
Contact Mr M Round, tel: (0121) 422 5311

New Members

Students

Julian Roger Pomfret, The University of Leeds
Simon David Preece, The University of Middlesex
Georgios Prosgolitis, The University of Middlesex
Keith Robert Ranson, The University of Leeds
Graham Edward Reid, The University of Ulster
Matthew Luke Robinson, The University of Ulster
David Patrick Rowlands, The University of Middlesex
Andrew Philip Seaman, The University of Coventry
Christopher Blake Shanley, The University of Coventry
Vassilis Skourlis, The University of Middlesex
Marielle Andrea Sofia Siraa, Imperial College
Peter Antonio Solinas, The University of Leeds
Natalia Ivanova Spassova, The University of Middlesex
Nuno da Silva Themudo, The University of Middlesex
Neal Thomas, The University of Leeds
Hakan Uysal, The University of Middlesex
Andrew MacDonald Webb, The University of Strathclyde
Edward Conway Williamson, The University of Cranfield
Alan Frederick Young, The University of Leeds
Shan Zhong Zhao, The University of Middlesex.

EVENTS

September 1996

Second European Biofuels Forum
Conference, 22-25 September, Graz, Austria.
Details from Joanneum Research, Elisabethstrasse 11, A-8010, Graz, Austria. Fax: +43 316 876 320

Heat pumping technologies: towards the next century
Conference, 22-26 September, Toronto, Canada.
Details from Mrs Alysone Will, The Paragon Conference and Event Group, 26 Sixth Street, Toronto, Ontario, Canada M8V 3A2. Tel: +1 416 252 2881, Fax: +1 416 252 5006, e-mail: 74117.155@compuserve.com

Fuel Cell Systems for Power Generation and Transport
IMechE seminar, 24 September, London. Details from Ellis Lloyd Payne, IMechE, 1 Birdcage Walk, London SW1H 9JJ. Tel: 0171 973 1304; fax: 0171 222 9881.

Waste-to-Energy: the future of European thermal waste treatment
Conference, 26-27 September, D¸sseldorf, Germany.
Details from Euromanagement, PO Box 2192, 5600 CD Eindhoven, The Netherlands. Tel: +31 40 2 974 944, fax: +31 40 2 974 950

October 1996

Inpower 96
Exhibition, 1-2 October, Wembley, London.
Details from Nicky Molloy, FMJ International Publications Ltd, Queensway House, 2 Queensway, Redhill, Surrey, RH1 1QS. Tel: 01737 768611, fax: 01737 761685

4th Kazakstan International Oil & Gas Exhibition
Exhibition, 2-5 October, Almaty, Kazakstan
Details from Stefy Thompson, ITE London, tel: 0171 286 9720, fax: 0171 286 0177

International Telecommunications Energy Conference
Conference, 6-10 October, Boston, US.
Details from WJ Hazen, INTELEC 96, 65 Agnes drive, Framingham, MA 01701 3845, US. Tel: +1 508 877 0783, fax: +1 508 877 5360

Distribution automation and demand side management
Conference and exhibition, 8-10 October, Vienna, Austria.
Details from Astrid de Meijer, DA/DSM Europe Management, PO Box 9402, 3506 GK Utrecht, The Netherlands. Tel: +31 20 2650963, fax: +31 30 2650928, e-mail: astrid@pennwell.com

High voltage measurements and calibration
Conference and exhibition, 9-11 October, Milan, Italy.
Details from Janine Stook, ERA Technology Ltd, Cleeve Road, Leatherhead, Surrey KT22 7SA. Tel: 01372 367000, fax: 01372 377927, e-mail: conferences@era.co.uk

Europe's cogeneration markets of the future
Conference, 10-11th October, Brussels. Details from COGEN Europe, Rue Gulledelle 98, 1200 Brusels, Belgium. Tel: +32 2 772 8290: fax: +32 2 772 5044.

CoalTrans 96
Conference, 21-23 October, Madrid, Spain.
Details from CoalTrans Conferences Ltd, Nestor House, Playhouse Yard, London EC4V 5EX. Tel: 0171 779 8945, fax: 0171 779 8946, e-mail: 101317.2716@compuserve.com

The on-line energy manager
Half-day tutorial, Gloucestershire, 23rd October.
Details from Vilnis Vesma, 8-10 Church Street, Newent, Gloucestershire. Tel: 01531 821350; fax: 01531 822882; e-mail: 100265.1770@compuserve.com.

Sizewell B - the first cycle
Conference, 28-30 October, London.
Details from Conference Services, IEE, Savoy Place, London WC2R 0BL. Tel: 0171 344 8432, fax: 0171 240 8830

Mineral resources of the Commonwealth of Independent States
Conference and exhibition, 29 October - 2 November, St Petersburg, Russia.
Details from PO Box 215, 199004, St Petersburg, Russia. Tel: +7 812 355 7952, fax: +7 812 213 5926

Redundancy to consultancy
One-day briefing, Gloucestershire, 30th October.
Details from Vilnis Vesma, 8-10 Church Street, Newent, Gloucestershire. Tel: 01531 821350; fax: 01531 822882; e-mail: 100265.1770@compuserve.com.

November 1996

ASME Turbo Asia 96
Exhibition, 5-7 November, Jakarta, Indonesia.
Details from IGTI/ASME, PO Box 422029, Atlanta, GA 30342, US. Tel: +1 404 847 0072, fax: +1 404 847 0151, e-mail: grossw@asme.org

19th World Energy Engineering Congress
Exhibition, 6-8 November, Atlanta, US.
Details from Ted Kurklis, WEEC Exhibit Manager, PO Box 1026, Lilburn, GA 30226, US. Tel: +1 770 925 9648, fax: +1 770 381 9865

Holland Oil & Gas
Exhibition, 12-14 November, Amsterdam, The Netherlands.
Details from Amsterdam Rai, PO Box 77777, NL-1070 MS, Amsterdam, The Netherlands. Tel: +31 20 459 1212, fax: +31 20 646 4469

Energy Economy 96
Exhibition on energy management, 12-14 November, Amsterdam. Details from London rai, Glen House, 200/208 Tottenham Court Road, London W1P 9LA. Tel: 0171 436 9774; fax 0171 436 5694.

New opportunities for the UK gas industry
Society of British Industries autumn seminar, 13th November, The Belfry, Warwickshire.
Details from SBGI, 36 Holly Walk, Leamington Spa, Warwickshire CV32 4LY. Tel: 01926 334357; fax: 01926 450459.

Cutting costs by degree day analysis
Two-hour tutorial, Gloucestershire, 20th November.
Details from Vilnis Vesma, 8-10 Church Street, Newent, Gloucestershire. Tel: 01531 821350; fax: 01531 822882; e-mail: 100265.1770@compuserve.com.

The strategic importance of oil & gas technology
European Commission conference, 26-28 November, Edinburgh
Details from Jane Kennedy, PSTI, Offshore Technology park, Exploration Drive, Aberdeen AB23 8GX. Tel: 01224 706600, fax: 01224 706601

Cost reduction through waste avoidance
Half-day tutorial, Gloucestershire, 27th November.
Details from Vilnis Vesma, 8-10 Church Street, Newent, Gloucestershire. Tel: 01531 821350; fax: 01531 822882; e-mail: 100265.1770@compuserve.com.

December 1996

7th Australian Coal Science Conference
Conference, 2-4 December, Churchill, Australia.
Details from Dr Geof Perry, HRL Technology Pty Ltd, Private Bag No 1, Morwell 3840, Victoria Australia. Tel: +61 51 321500, fax: +61 51 321580, e-mail: perrg@hrl.com.au

GASTECH 96
LNG/LPG conference and exhibition, 3-6 December, Vienna, Austria.
Details from London Rai, Glen House, 200-208 Tottenham Court Road, London W1P 9LA. Tel: 0171 436 9774, fax: 0171 436 5694

NEMEX 96
Exhibition and conference, 3-4 December, Birmingham.
Details from ESTA, PO Box 16, Stroud, Glos GL6 9YB. Tel: 01453 88676, fax: 01453 885226

1996 Nuclear Congress: power for the next century
Conference, 4-5 December, London
Details from Sue Frye, BNES, One Great George Street, London SW1P 3AA. Fax: 0171 233 1743

Energy benchmarking
Half-day tutorial, Gloucestershire, 11th December.
Details from Vilnis Vesma, 8-10 Church Street, Newent, Gloucestershire. Tel: 01531 821350; fax: 01531 822882; e-mail: 100265.1770@compuserve.com.

ADVERTISEMENT FEATURE – SHEFFIELD HEAT & POWER

Sheffield Heat and Power Ltd is a private Utility company supplying energy from waste. The scheme utilises waste from Sheffield Council's Municipal Solid Waste Incinerator to operate an independent District Heating system within Sheffield City centre.

The volume of refuse generates 34 MW of heat, sufficient to meet the heating needs of the majority of the largest buildings in the City centre. The hot water is then pumped through a network of pre-insulated underground pipes to a heat exchanger at the consumer's building; transferring the heat energy from the district heating network into the building's existing heating and hot water systems.

Standby and peak load heat generation capacity is provided by four boiler plants situated throughout the network, ensuring integrity of supply.

From being established in 1988, Sheffield Heat & Power have invested over £14 million within the City, installing 36 km of pipeline, supplying heat to over 3,500 high-rise council homes and the major public, commercial and educational buildings within the City centre.

District Heating provides many benefits for consumers and society, improving energy efficiency and the local air quality through the reduction in polluting emissions. Every building connected means that a source of pollution (the boiler installation) is turned off.

For every 100,000 MWh of energy supplied by District Heating it displaces 34,000 tonnes of carbon dioxide (a gas associated with global warming) with significant reductions of sulphur dioxide and oxides of nitrogen emissions being achieved. Sheffield Heat & Power currently deliver 130,000 MWh annually with a connected capacity of over 120 MW.

This innovative District Heating network has gained real commitment in Sheffield and overwhelming support locally from the various stakeholders who see the potential benefits of the scheme in terms of:-

- economic activity through major capital investment of £14 million to date;

- better heating standards for residents and businesses;

- continued improvement in the environment.

Sheffield Heat & Power are providing a sustainable City centre heating scheme that provides environmental benefits for people, whether they live or work within the City centre together with long-term energy and cost savings. In 1995, cumulative energy savings for connected district heating buildings equated to 870,645 MWh, since the scheme was introduced in 1988.

The Sheffield District Heating scheme is the largest in the UK and the unqualified success of the *"green heat"* network has enabled Sheffield Heat & Power to continue with the expansion of the scheme. Now in its fourth phase, over 90 buildings have been connected, providing heat to hospitals, universities, offices, public buildings, retail outlets, leisure centres and housing estates throughout the City centre; this being due to the many benefits associated with a district heating connection, for the consumer and the environment:-

- **Competitive:** Sheffield Heat & Power's pricing structure competes successfully with other energy utilities with the advantage of offering price stability, unaffected by exchange rates, market swings and the availability of fossil fuels.

- **Economical:** The system utilises waste, a renewable source of energy.

- **Efficient:** Monitoring, maintenance and installation techniques have been developed to ensure a continuous supply. District heating systems can maximise energy efficiency to over 85 per cent, while the pipelines have a thermal efficiency of over 98 per cent.

- **Safe and Reliable Operation:** The heat exchanger is installed in place of a conventional boiler, and unlike a boiler produces no fumes, no noxious or poisonous gases and is silent in operation.

- **Flexibility:** The user has control and flexibility to monitor and adjust energy consumption to provide a comfortable environment.

- **Back Up Facilities:** The network is supported by four pre-heated standby boiler plants ready to come on line at a moments notice situated around the network, maintaining a high level of security.

- **Space Saving:** a heat exchanger requires around one tenth of the space of a conventional boiler plant.

- **Reduced Capital/Maintenance Costs:** Minimal maintenance is required due to the small amount of moving parts within the heat exchanger, together with the significantly reduced capital outlay associated with a District Heating connection.

Two 15 MW boilers at the Bernard Road Boilerhouse provide back-up heat for the system

Sheffield Heat & Power operate within a very competitive marketplace and are continuing to assess opportunities to expand their business portfolio, which at this time includes the supply of Electricity generated from Waste; the development of Clinical Waste Facilities; the implementation of small scale Combined Heat & Power plants for major consumers and other associated waste management projects.

The company is currently project managing retrofitting works at the City's Incinerator which is the primary energy source for the District Heating network. The Bernard Road Incinerator Plant was opened in 1975 and is the principal means of disposing of municipal waste in Sheffield and an integral part of the Sheffield District Heating scheme, burning approximately 130,000 tonnes of refuse in a year.

Latest European Standards have placed stricter controls on emissions from municipal waste incinerators which must be met by the end of 1996 and Sheffield Heat & Power are project managing a substantial programme of changes to the plant and its current operation.

The diagram (below right) attempts to provide a graphical representation of the changes taking place through the Energy from Waste process - the full cycle from the delivery of waste to the production of heat and electricity at the Bernard Road Incinerator Plant.

The energy that is recovered from the incineration process is recovered by steam boilers which use the combustion gases to heat water which either produce steam to drive turbines (for electricity) or is piped to provide heat for Sheffield Heat & Power's District Heating consumers.

ADVERTISEMENT FEATURE – SHEFFIELD HEAT & POWER

The major proportion of the upgrading work applies to the flue gas treatment which 'cleans' the combustion gases to prevent the emission of noxious substances into the atmosphere.

Sheffield Heat & Power have recently been successful in obtaining a Non-Fossil Fuel Contract for the generation of electricity by utilising the steam produced at Bernard Road, a first step in running a large-scale Heat & Power station in the City.

The company is currently in the advanced stages of planning the installation of a steam turbine to provide electricity to meet on-site demand with the remaining power being exported to the local distribution grid.

Sheffield Heat & Power also operate a Consultancy Division, offering know-how to other organisations and local authorities who wish to consider the feasibility of setting up their own Combined Heat & Power/District Heating schemes, providing the required skills and resources to compliment those of the clients, having a distinct advantage through previous experience in running a District Heating scheme first hand.

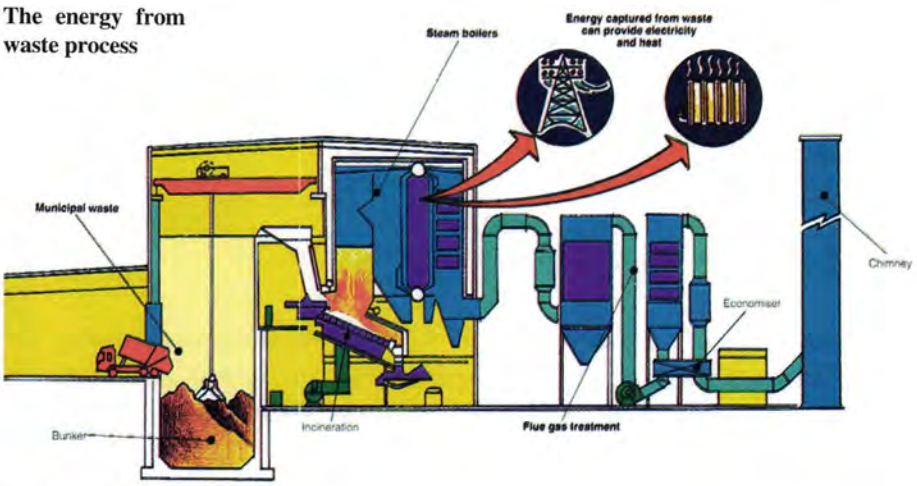
Decision makers everywhere are now appreciating the opportunities for Combined Heat and Power/District Heating schemes, particularly in buildings where utilisation of energy, reliability, comfort for the user and economic considerations are of prime importance.

Sheffield is showing the way to a cleaner, safer and environmentally friendly City as growing awareness of conservation and the effects of pollution are leading to increased pressure on government, commerce and industry to take energy and the environment seriously.

This heat exchanger installation—which replaces boiler plant —illustrates the potential for space-saving with district heating

Pipework installation—the insulated heating mains are installed underground

The energy from waste process



SHEFFIELD HEAT & POWER

green heat

July/August 1996

CONFERENCE ANNOUNCEMENT

BIOMASS: *New Energy Source for Heat and Power*

The Institute of Energy in partnership with The Solar Energy Society is running a conference on this subject after much demand, it will be held on 10 December 1996. Biomass as an energy source for heat and power is increasing in importance as we approach the next millennium. The US Department of Energy has declared that bioenergy will be the most important renewable energy technology for the next 25 years. Currently various European countries such as Sweden and Denmark are responding with the rapid development of various biomass technologies. The global availability of biomass gives it significant potential as a fuel for energy production in both the developed and the developing countries. It is for these reasons that this conference will bring together an international gathering of professionals from various disciplines to provide you with consolidated experience and practical advice towards bioenergy solutions. During this conference the status of bioenergy will be debated with regards to the results of recent projects, examining the technical obstacles and the success stories. It will look at the environmental implications of mixing coal with biomass, the financial aspects, cultural issues and building bridges between farmers and power producers. The conference is being co-sponsored by ETSU, The National Farmers Union and British Biogen.

The speakers:

- **Sven-Olov Ericson,** Vattenfall (Stockholm, Sweden)
- **Ralph Overend** NREL (Colorado, US)
- **Georges DuPont-Roc** Shell International Ltd (UK)
- **Alan Green,** Associated Energy Projects (UK)
- **Anna Stanford** Friends of the Earth (UK)
- **Olav Hohmeyer** ZEW (Mannheim, Germany)
- **Mike Cannon** European Gas Turbines (UK)
- **Peter Billins** British Biogen (UK)

The Third International Conference on COMBUSTION & EMISSIONSCONTROL

will be held on 11 & 12 June 1997, in the beautiful historic city of Bath, UK. Co-sponsored by The Institute of Physics, Combustion Group, The Combustion Engineering Association, The Combustion Institute, The Institution of Plant Engineers and The World Coal Institute.

The Institute of Energy is running the third in the series due to the success of its predecessors. This conference will expand on the topics and introduce new and innovative developments to the equation. The conference will act as a forum for discussing the state of the art technology and experience as well as to explore innovative research leading to further developments. On the evening of 11 June the Institute will hold a conference dinner in the Pump room, preceded by a drinks reception around the Roman Bath itself. There is also an option of a technical visit on the 13th June to Blue Circle Industries.

We would be pleased to receive abstracts on the following areas

- ***Power Generation***
- ***Gas Turbines***
- ***Refueling options***
- ***Pollutants***
- ***Process Industries***
- ***Biofuels***
- ***Novel Combustion Systems***

If you would like to submit an abstract for the Combustion & Emissions control conference or you are interested in attending either of the conferences as a delegate or an exhibitor please contact Louise Collins at The Institute of Energy, Tel: 0171 580 7124 or Fax 0171 580 4420