THE SAFE ENERGY JOURNAL

SCRAM

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The economics of Sizewell B

Home Energy Rating: a 'Good Thing'

Amenity-ville Horror

Beyond draughtproofing

THORP: Sellafield's new threat

Radon gas means tested

The playing field slopes South

Acid House party

Lowering the risks

COMMENT

WE THOUGHT the privatisation of the electricity industry had got about as bad as it could - we were wrong! It was already a shambles, but the announcement that Energy Secretary John Wakeham is considering flogging PowerGen, lock stock and real estate, to Hanson or some other corporate bidder, has made a nonsense of the whole thing.

The new structure was meant to introduce competition, but the Government felt obliged to create a duopoly, in order to leave National Power large enough to cope with nuclear power. Now that nuclear power is no longer being privatised, the structure looks absurd, and indeed Wakeham has admitted he would not have chosen such a structure.

The White Paper on Privatisation talked about the generating companies being "free to purchase coal and other fuels from the most competitive sources". So, the free market dogma was always intended to ride roughshod over thousands of people's livelihoods, both in this country and abroad. The UK's coal resources will be sterilised (at a time when the nuclear industry talk about the need to keep the fast reactor open in case of future energy shortages), and thousands of miners - not just those loyal to Scargill, but UDM members as well - will be thrown on the dole. Coal will instead be imported from countries like South Africa and Colombia, where there are no luxuries like environmental protection or fair wages or rules about health and safety - rights which have been hard won in this country.

If Hanson do buy PowerGen, they will have a ready market for coal from Hanson owned coal mines around the world. Is this really competition or is Wakeham merely helping to create another multinational mega-energy corporation, who move their money and resources around the world with little or no regard for people or the environment? And whatever happened to the aim of widening share ownership? Privatisation has become the end in itself, and the Government have sent a clear message to the people of the UK, 'Sod Sid'.

DOUNREAY'S obsession with all things nuclear is threatening the future of the Caithness economy. The overseas reprocessing contracts the management are now chasing promise to turn Dounreay into Scotland's Sellafield. In their blind bid to save 500 'nuclear' jobs in Dounreay, they have stirred up a hornets nest. They could find that only a handful of countries are prepared to buck the opinions of the Nordic countries, Scottish local authorities and Scottish public opinion, and send their waste here. The management will then have lost the opportunity, which the next four years - until the closure of the prototype fast reactor - presents, to look for alternative ways of saving jobs. Caithness is perfect for wind and wave power, and the countries with research reactors which are running out of space for the spent fuel, will need some solution to their problem. Why aren't Dounreay doing work on dry storage?

The fast reactor must be laid to rest, before it soaks up any more money. Continuing with a project that has little prospect of producing electricity as 'cheaply' as a PWR, and it is now very unlikely that the European Commercial Fast Reactor will ever be built, is madness. It's a pity that the £4bn spent on fast reactor research wasn't spent on something useful like solving heating, insulation and condensation problems in public sector housing. It's time to start sewing up the gaping hole in the public purse.

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The Government has just restricted the grant system for householders treating their homes against radon gas, which runs contrary to recent evidence on the dangers of radon. **Patrick Green**, of FoE, calls for a rolling programme to treat the worst affected houses.

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The 600MW Renewable Energy Tranche, created as part of electricity privatisation, applies only to England and Wales. **Dr John Twidell**, Director of Energy Studies at Strathclyde University, argues that this has created "unfairness by a factor of three" for renewables development in Scotland and Northern Ireland.

18 Acid House party

Though less publicised than its 'stable mate' ***The Cost of Nuclear Power***, **Mike Townsley** found the House of Commons Energy Select Committee's report ***The Flue Gas Desulphurisation Programme*** to be similarly critical of the gulf between Government rhetoric and action.

20 Lowering the risks

The Gardner findings and other recent reports have validated calls for lower radiation limits made five years ago at the First Standing Conference on Low-Level Radiation and Health. **Pete Roche** reports on the Sixth Conference, held this year in Bangor, North Wales.

Hysterical accounting

IT will "never again be possible to take assurances as to the viability of any type of nuclear power on trust", according to the House of Commons Energy Select Committee. Their report on ***The Cost of Nuclear Power*** accuses both the CEGB and SSEB of inadequately assessing costs and a "systematic bias ... in favour of nuclear power". The Department of Energy (DoEn) was also criticised for not obtaining the likely costs of nuclear power in the private sector as soon as privatisation was first mooted.

The privatisation policy was embarked upon without adequate information, and Department of Energy (DoEn) failed to give the nuclear issue sufficient priority, despite the fact that nuclear power had determined the structure. Cecil Parkinson, the then Secretary of State for Energy, made "inadequate preparation [and] failed to obtain the information needed to ascertain whether the policy would work."

Removing nuclear power from the privatisation has left a structure which John Wakeham, the Secretary of State for Energy, admits he would not have chosen.

The Fossil Fuel Levy represents a "huge subsidy" of £900 million a year to nuclear power, which will have substantial economic and social effects. The Committee therefore want the DoEn and the Regulator to "publish comprehensive information on how the Levy is set and the reasons for any changes."

At the time of the 1994 Review of nuclear power "sufficiently detailed material should be published ... to permit an informed public debate before any decisions are taken" The cost of diversity of supply and reduced pollution should be made abundantly clear and "compared with the cost of achieving the same ends by other means".

Malcolm Rifkind, Secretary of State for Scotland, is accused of making mistakes similar to those made by his Whitehall counterparts: "The relatively good performance of nuclear plants in Scotland seems to have given a false sense of security as regards their costs."

The MPs were "dismayed" to find the SSEB still using historic cost accounting which "constitutes a systematic bias in favour of capital intensive projects such as nuclear power". The CEGB abandoned historic costs, after the Energy Committee criticised them as "highly misleading", nearly a decade ago.

The two Scottish Boards were forced to set aside an additional £924.4m in their 1988-89 accounts, mainly for reprocessing, decommissioning and waste disposal costs: "In consequence both Scottish boards became technically insolvent." This situation would not be permitted in an ordinary limited company and was only resolved by transferring the nuclear assets and liabilities to Scottish Nuclear Limited (SNL). "It is clear therefore", says the Committee, "that Scotland is no more the beneficiary of cheap nuclear power than are England and Wales."

There is no Fossil Fuel Levy in Scotland. Instead there is a "Nuclear Energy Agreement" whereby the two privatised Scottish electricity companies will buy the whole of SNL's output "at a price set in relation to the market price of electricity, rather than SNL's costs". A £1,368m debt write off and assistance for nuclear liabilities, especially decommissioning, means SNL's output "will be subsidised by the taxpayer" rather than the electricity consumer, as in England and Wales. The Committee refers to this as "an undesirable distortion ... between Scotland and England and Wales".

The Committee conclude that, although there were genuine increases in the cost of nuclear power, the great bulk of the increases reflect the fact that costs were not adequately assessed, which has led to a "prejudice in investment decisions against non-nuclear generation." Unfortunately the Fossil Fuel Levy and the Scottish Nuclear Agreement mean that this "prejudice" could be allowed to continue until 1998. □

■ **For the Committee's comments on Sizewell B see pages 8 and 9.**

Cost criticisms rejected

ALL the main conclusions of the Energy Select Committee's report on nuclear costs have been rejected by the Government, in a 21 page memorandum released late in the afternoon on the day the Committee's report on fast reactors was published. Labour's energy spokesperson, Frank Dobson, described this as "crude news management".

John Wakeham, Secretary of State for Energy, rejected accusations that the DoEn failed to calculate the cost of nuclear power in the private sector as "wholly unjustified criticisms".

In an obvious attempt to shift the blame onto the industry, the memorandum said the Government made "exhaustive attempts ... to obtain information from the CEGB with only limited success". The Government said the Committee misunderstood the relationship between government and nationalised industry: "The only further action the Department could have taken was to dismiss one or more members of the board for failing to provide the information requested in a timely fashion."

Wakeham defended his predecessor, Cecil Parkinson, saying that Cecil "deserves real credit for determined action" for breaking the monopoly in electricity generation. "It is perverse and unjustified", he said, "to criticise Cecil Parkinson for having the courage to demand and ultimately to get a greater degree of openness about nuclear costs and risks than would have been conceivable previously".

The memorandum ducks the Committee's recommendation that nuclear investments should be subject to the private sector's rate of return, but says the Government "is taking steps to ensure that much more information about nuclear costs will be published than in recent years". □

Opening the Markets

PLANS by the European Commission (EC) to open the energy markets in 1992 "will not be fulfilled, and will be postponed until a later date, if not dropped altogether", predicts a new report * by Andrew Holmes for the Financial Times Business Information, and the UK's privatisation experiment will not be copied elsewhere.

In 1988 free market rhetoric from Brussels and Whitehall was running high, and utilities across the world were watching the UK's first daring steps forward with keen interest. Now the EC's open market scheme has been watered down to the point where it is unrecognisable and the UK's privatisation scheme gives no promise of fulfilling the pledges made to the country's electricity consumers and "will not be widely imitated".

The EC's attempt to open the electricity market has become enmeshed in objections from all sides. If the French, for example, were to succeed in selling some of their surplus nuclear electricity to large industrial consumers in Germany, there would inevitably be complaints about unfair trading practices, which would lead to questions about the highly diverse financial treatment of electricity utilities in the 12 member states. Such a system, which has evolved over many decades, cannot be tampered with at will.

Holmes also believes "there will be no revival of nuclear power". If the infrastructure which serves nuclear power in Europe is to be kept alive, reactor ordering needs to begin again in the 1990s. The last sign of an active nuclear programme was in the UK. Now it is hard to see which utility will get the bandwagon rolling again.

The free market was the dominant dogma of the 1980s, Holmes predicts the environment will dominate the 1990s, but it will be handled in a haphazard way by governments throughout the continent. □

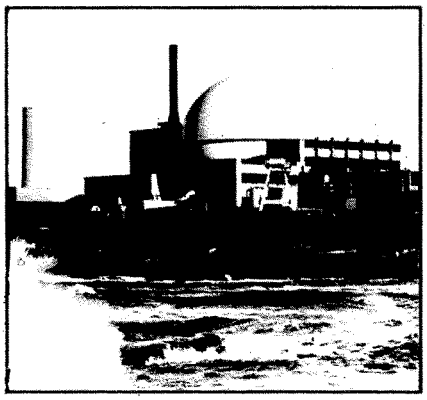
*** Electricity in Europe: Power and Profit by Andrew Holmes. £203 from FTBI, 7th Floor, 50-64 Broadway, London, SW1H 0DB.**

Not-so-fast reactor

NO justification exists, at present, for the UK to participate in the construction of the European Fast Reactor (EFR) in 1997, according to the House of Commons Energy Committee. The all party committee of MPs see little prospect of a significant fast reactor industry in the next century, therefore arguments about throwing away the £4bn already spent on fast reactor research and development (R&D) are "not relevant".

The Government's 1988 review of the fast reactor programme concluded that fast reactors would not be required for at least 30 or 40 years and expenditure of £100m per year could no longer be justified. The Dounreay Prototype Fast Reactor (PFR) will not be funded after 1994 and the fast reactor reprocessing plant after 1997. The MPs could see no reason to dissent from this decision.

European collaboration over the fast reactor began in 1984 when the UK, France, West Germany, Belgium and Italy signed an Intergovernmental Memorandum of Understanding. Each of the first three countries were expected to build a large fast reactor. By July 1988 the then Secretary of State for Energy described the collaboration as being "in some disarray".



In February 1989 the UK, France and West Germany agreed to focus on a single large EFR, with construction to begin in 1997 and full power expected by 2005.

The UK is currently spending £10m per year on the European collaboration. But in 1997, when the decision on whether to construct the EFR is to be taken, very heavy expenditure would be required. The UK's share would be £800m (in 1989 money). The Committee want the UK to review its participation in the EFR in 1993 and 1997 and to withdraw "in 1997 at the latest if no new evidence has become available indicating that there is a likelihood of fast reactors becoming viable by about 2020-2030".

The MPs were unimpressed by most of the arguments put forward for preserving the fast reactor research programme, such as the need for energy security or to combat the greenhouse effect. "In our view there can be no justification for major expenditure on fast reactor programmes unless there is a potential economic case." An extremely large rise in uranium prices, caused by shortages, would be needed to make fast reactors competitive, even with PWRs which are "certainly not" economic.

The energy security argument is unconvincing "at a time when substantial indigenous coal reserves are being sterilised by pit closures". The greenhouse effect argument is another version of the uranium scarcity argument since any country which sees nuclear power as a response could simply build more thermal reactors. Therefore "fast reactors must be judged solely as an insurance policy against possible uranium scarcity".

The Report concludes that uranium scarcity is unlikely to make it necessary to order fast reactors as early as 2020 "and on the Government's own forecasts the need might not arise until 2120". No decision on the construction of the European Demonstration fast reactor Reprocessing Plant (EDRP) needs to be taken until 2012 at the earliest.

Job losses as a result of the run-down at Dounreay could be as high as 2,440 (of which 1,600 would be direct job losses at Dounreay) - some 16% of the present labour force in Caithness and Sutherland. Dounreay has, however, identified several opportunities for diversification, and particular progress has been made in gaining decontamination and other work from the oil industry. Unfortunately the UKAEA "believes the main area for developing new work is fuel cycle services, which would be predominantly for overseas customers."

The MPs note the natural advantages of Caithness for R&D work on renewable energy sources, in particular wind and wave power. "Many of the renewable forms of generation are at a similar stage of development to fast reactors - that is, technically proven but not commercially viable ... This should be reflected in the Department's funding of energy R&D."

The cost of developing fast reactors is substantial compared with funding available for other energy research. The opportunity cost in terms of R&D foregone is considerable, not just in terms of money, but also scientific expertise. Since 1974 the total expenditure on renewables has been £220 million, while over £200 million is spent on nuclear each year.

"Thirty years of government funding comparable to that required to develop fast reactors might transform other energy sources (such as some of the renewables) into commercially viable forms of generation in widespread use."

The depths to which the nuclear industry's reputation has sunk are summed up by the Committee Chairman, Tory MP Dr Michael Clark, speaking to the CEGB witness: "those of us who have supported the nuclear industry in the past are very disturbed by the changing costings that have come out in recent months and we are now a lot more sceptical about everything we hear from the nuclear industry." □

Dounreay contracts

ICELAND, Faroe, Norway and Denmark have all protested to the UK over plans to reprocess spent Highly Enriched Uranium Fuel (HEU), from foreign research reactors, at Dounreay in Caithness. Dounreay is about to sign contracts with West Germany, the Netherlands and Spain, but have also received inquiries from 50 research reactors around the world, including one in Australia, following their offer to store and reprocess the waste (*SCRAM 77*).

The Icelandic Environment Minister, Julius Solnes, sums up the Nordic protest in his letter to Chris Patten, UK Secretary of State for the Environment. Solnes states this increased activity at Dounreay "will greatly increase the risk to the marine environment of the North Atlantic and North Sea".

Iceland, Faroe and Norway have also written to the governments of West Germany, Spain and the Netherlands protesting against the new contracts. The Shetland Campaign Against Dounreay Expansion (CADE) are asking their supporters to write to the 4 governments concerned. "The US Department of Energy has recently banned the shipment of all such spent fuel because of environmental worries", says CADE: "Britain however, alone in the world, remains willing to take foreign HEU fuel, thus putting the economic interests of our struggling and discredited nuclear industry before the interests of our environment."

Dounreay management claim that international contracts worth around £25m could save up to 500 jobs at Dounreay, to counter the scheduled rundown of the prototype fast reactor. Meanwhile, Highland Regional Council is investigating whether Dounreay has the necessary planning consent to handle the increased scale of work involved in the proposed newcontracts.

The Nuclear Free Local Authorities (Scottish and UK Steering Committees) have concentrated on lobbying the West Berlin Senate, where a decision on whether to relicense the Hahn-Meitner Institute (HMI) reactor has been postponed until at least 7 August. Senator Riedmuller (SPD), the Berlin Minister for Research wants the reactor to re-start, but Senator Schreyer (Berlin Green Party), Minister for the Environment, does not. Schreyer's resolve has stiffened since a conference of SPD run States concluded that storage of German spent fuel abroad is no longer an acceptable spent fuel management strategy. □

Sizewell safety doubts

DURING the past few years the debate about PWRs has concentrated on the many revelations about nuclear economics, but has ignored safety. Bristol Area Conservation Society (CONSOC) have written to John Wakeham to draw his attention to new evidence on safety, which has emerged since the Hinkley Inquiry closed the safety topic in March 1989. The evidence, they say, has "undermined and invalidated" assumptions about PWR control rods and computer systems, and raised doubts about pressure vessel integrity.

The results of a series of tests conducted in the USA on behalf of the OECD's Nuclear Energy Agency between 1983 and 1985 were only published in May this year. The Loss of Fluid Test (LOFT) Project revealed "significant new information concerning the behaviour of a nuclear reactor during a severe nuclear accident". Evidence from the LOFT project suggests that PWR control rods may be defective. When they melt and burst (as occurred at Three Mile Island - TMI) they may act in such a way as to hasten the onset of a meltdown.

Sizewell B will be the UK's first civil reactor with a computer-controlled Reactor Protection System. Many of the concerns about software, raised by the British Computer Society at the Hinkley Inquiry, have since been confirmed by the Institute of Electrical Engineers (IEE). For example, in their report, entitled ***Software in safety-related systems***, the IEE state: "It is not presently possible to quantify the reliability of software." ***Nucleonics Week***, in May this year, reported that "a long-standing error in computer software" caused a fuelling accident in Canada. The error "only came to light under a specific set of circumstances".

Evidence from TMI suggests that there may have been defects in the Reactor Pressure Vessel. Further investigations may or may not reveal further defects which could also affect Sizewell B's Reactor Pressure Vessel. Prudence suggests that further work on Sizewell B should be contingent on learning the results of these examinations.

The evidence submitted to the Hinkley Inquiry was incomplete, simply because investigations at TMI are still incomplete, and because the results of the LOFT Project are only being reported now, 5 years after the tests were completed. CONSOC say the evidence justifies converting Sizewell B into a gas-fired power station: "Such a conversion is the best means of mitigating the economic loss and of avoiding the safety risks which otherwise will arise." □

■ **Copies of CONSOC's 40 page letter to John Wakeham available from SCRAM for £5.**

Non-ionising radiation 'probably' carcinogenic

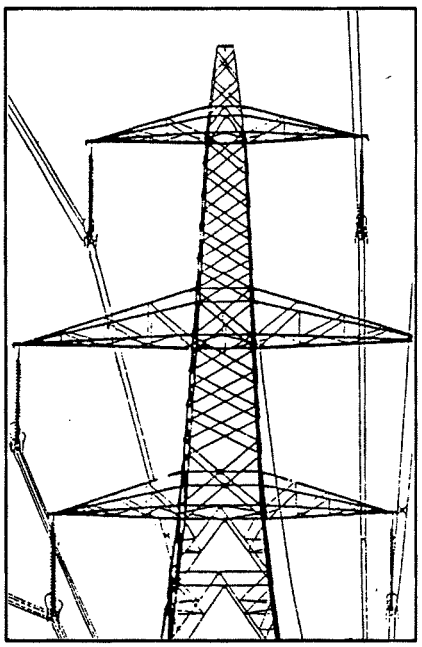
RESEARCHERS at the US Environmental Protection Agency (EPA) have recommended that extremely low frequency (ELF) electromagnetic fields be classified as "probable human carcinogens", alongside PCBs and DDT.

They also recommended that radiofrequency and microwave (RF/MW) radiation be designated as a "possible" carcinogen, in the same class as saccharin. Their recommendations were based on a two-year review of the health effects literature - primarily epidemiological studies.

However, the Director of the EPA's Office of Health and Environmental Assessment, Dr William Farland, ordered the recommendations to be deleted, it was revealed in the latest issue of the New York based magazine ***Microwave News***.

The document, ***An Evaluation of the Potential Carcinogenicity of Electromagnetic Field***, will now be issued without the risk classifications, but it still concludes that ELF studies of leukaemia, lymphoma and cancer of the nervous system among children and workers "show a consistent pattern of response that suggests, but does not prove, a causal link".

Farland says he will now ask two committees of experts to decide how to resolve the issue of risk classification. Whatever the outcome, electromagnetic fields, from for example power lines, have gone from being a relatively obscure issue in the US to being an issue of national prominence. □



Nirex 'hindsite'?

NIREX "no longer" has a reserve list of 10 alternative locations for a low and intermediate-level nuclear waste dump, should both Dounreay and Sellafield prove unsuitable.

Speaking to the Welsh Nuclear Free Zones Forum in July, John Hutchins, Senior Information Officer for Nirex said should Sellafield and Dounreay prove unsuitable, Nirex would have to begin the site selection process again.

Whether or not Nirex ever had a secret list of 10 sites must now be open to question. Either way it now means that if Nirex decide Dounreay and Sellafield are unsuitable the whole country is once again under threat.

Meanwhile, the argument over the final destination of low and intermediate-level nuclear waste arising from foreign reprocessing contracts rumbles on. The nuclear industry say that any contracts signed since 1976 would have a 'return-to-sender' clause.

For example, a Dounreay spokesperson talking about the contracts with three European research reactors which they are about to sign said in July: "there would be no question of us storing the nuclear waste as in any contract there would be a condition that nuclear waste went back".

However recent Parliamentary answers have referred MPs to an answer given by Mr Goodlad to Austin Mitchell on 2 May 1986 (Cmns 502-503). Mr Goodlad, talking about BNFL's (post-1976) overseas reprocessing contracts said "in respect of some of the less radioactive wastes there may be other options worthy of study - for example, whether it would be sensible to substitute an equivalent quantity in radiological terms, of higher level wastes". All waste from pre-1976 contracts will remain in this country.

According to the 1988 Radioactive Waste Inventory, there will be about 80,000m^3 of low and intermediate radioactive waste arising from the first ten years of operation at THORP, and the Department of Environment and Nirex accept that all these waste arisings will be disposed of in the UK. Two thirds of THORP's capacity is committed to reprocessing spent fuel from overseas. It follows, therefore that 53,000m^3 of waste arising from foreign reprocessing contracts will be dumped in the UK. □

Spain - one down nine to go

A National Energy Plan, which will determine strategy until the year 2000, will be presented to the Spanish Parliament later this year. Crucial to this plan will be a decision on whether or not to maintain the Country's 6 year old moratorium on nuclear power. The fire at Vandellos-1 in October 1989, and the runaway costs of nuclear power stations have hardened attitudes in the ruling Socialist Party against the atom, so prospects for an end to the moratorium seem poor.

The Socialist Government of Felipe Gonzalez, which came to power in 1982, had been considering nationalising the electricity industry, but one look at the accounts led to a swift change of mind. Over-investment, mainly in nuclear construction, meant that the whole electricity sector was on the verge of bankruptcy with debts of Ptas6 trillion (£31bn).

The chaotic financial structure of Spain's electricity industry would have caused problems even if the nuclear construction programme had been going smoothly, which it wasn't. The Government enforced a reshuffle of nuclear assets to take the strain off the more unstable utilities. Some of the smaller, virtually bankrupt, utilities were absorbed into the state utility ENDESA. Today the industry is still Ptas3.5 trillion (£18bn) in debt.

The Ministry of Industry and Energy is known to favour nuclear energy, as long as the costs are bearable. However, there is a growing segment of the Government and increasing numbers of Socialist backbenchers who find the nuclear option less and less attractive, on political and ecological grounds as much as economic reasons. The Socialist Government, narrowly balanced with a majority of only one seat in Parliament, and a certain erosion of its popular standing after 8 years in power, is not in a position to ignore its leading parliamentarians. The Socialist Party Congress will also vote later this year on the moratorium.

Central to the debate on the moratorium will be Spain's three suspended nuclear plants, Valdecaballeros, Lemoniz and Trillo 2. Valdecaballeros, in the South, is known as the "black hole" because of the amount of unproductive money it has swallowed since building was suspended. Should the political decision be to continue with the moratorium and, by implication, never start up Valdecaballeros, the utilities involved will expect compensation from the Government. The owners insist they have spent Ptas360bn (£1.79bn), but the Ministry of Industry and Energy only accepts Ptas90bn, because they say some of the costs ascribed by the owners to Valdecaballeros are not valid.

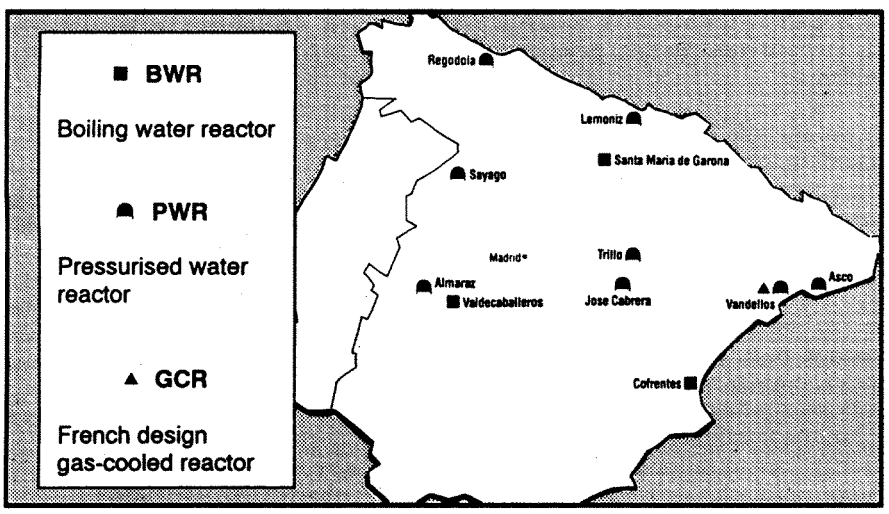
One of the other mothballed plants at Lemoniz, in Basque country, is also a particularly delicate question. It was built in the late 1970s but, in the face of violent hostility on the part of ETA, the Basque separatist movement, has never been started up. Romania has been considering acquiring some of the components from Lemoniz, for use in the much delayed Cernovada nuclear power plant, 200km from Bucharest.

Nuclear surcharge

Spain's electricity consumers, meanwhile, are paying a surcharge on their monthly bills for Spain's three suspended nuclear plants, and are meeting the cost of the debt servicing incurred by the electricity industry for its grand nuclear plans.

The other nuclear plant at the centre of the debate in Spain is Vandellos, 40km south of Tarragona, in Catalonia. Vandellos-1, a French designed gas-cooled reactor, has been idle since a serious fire damaged its turbines and control and cooling equipment, on 19 Oct 1989. The Spanish Minister for Energy, Claudio Aranzadi, announced on 30 May this year that the 17 year old plant would not be restarted "for economic not safety reasons".

The electricity industry was keen to see Vandellos-1's 480MW capacity restarted after repair of the fire damage and some adaptations to prevent further fires. But the mistake the operators made was to fail to implement fire prevention measures which were recommended in 1986 in the wake of Chernobyl.



As a result of the fire, CSN, the nuclear safety agency, demanded a major redesign of the plant before they would allow it to be restarted, which would cost in the region of Ptas40bn (£200m).

Spain's nuclear problems don't end there. On the afternoon of 8 July this year, Vandellos-2, a 923MW PWR, which came on line in 1987, suffered a leak of ionized water into its primary cooling circuit, and went into emergency shut down - the 'scram' procedure. No radioactivity leaked outside the plant, which was allowed to restart on 12 July, but the accident seriously damaged the nuclear industry's credibility.

It took 10 hours from the detection of the leak for the plant's management to alert the civil defence authorities in Tarragona. It is a clearly stipulated requirement of nuclear emergency plans that local authorities are notified immediately. For that lapse the owners will now be fined, but the fact that nuclear plant operators are not carrying out the requirements of the nuclear emergency plans gives serious cause for concern.

The source of the leak was a "prematurely-aged" joint in the plant's cooling system. This is bound to fuel anti-nuclear feeling in Spain - the plant has been on line for barely 3 years.

Vandellos-2 suffered no fewer than 3 fires in the transformer room in its first year of operation. After a fire on 3 December 1988, the plant was shut down for 3 months while the cause was investigated. The finding was that transformer materials had suffered "premature ageing".

Spain's other nuclear controversy concerns nuclear waste. By the end of this year, the nuclear waste management agency, Enresa, expects to have a new system of special containers for the storage of spent fuel. The system has been designed by Enresa, together with the US Nuclear Assistance Corporation. The designs are now awaiting the approval of both Spanish and US nuclear safety authorities. Each container will cost $1m and can be used both for transport and dry storage of spent nuclear fuel.

Enresa is planning a centralised waste storage facility, but as yet no location has been fixed. The Extremadura region once seemed a strong candidate, but the Portuguese authorities whose frontiers touch the region have blocked moves by officials for the last 5 years. Enresa is finding it has to tread very carefully on its path towards an acceptable nuclear waste storage programme.

The Spanish Government is now considering increasing electricity imports from France, perhaps up to 2,000MW - about a third of the new generating capacity Spain expects to need after 1995. Such an option, however unpopular with industry leaders who do not want Spain to be dependent on imports, would probably have a lower political costs than revoking the moratorium. □

Can the myth be maintained?
- understanding the economics of Sizewell B

MIKE HARPER, assistant energy campaigner for FoE (England & Wales), **explains the background to recent developments on the cost of Sizewell B.**

He concentrates on the latest, and most damning, Energy Select Committee Report[1], the capital cost increases and how Nuclear Electric and the Department of Energy are responding to the economic debacle.

SINCE the Hinkley Point Public Inquiry, a stream of evidence culminating in the report by the House of Commons Energy Select Committee[1] has reinforced the view that no conventional economic case can be devised to support the continued construction of Sizewell B nuclear power station: economic appraisals by MacKerron and Henney have been published; capital cost escalations at Sizewell B have been announced and an all-party Energy Select Committee has published a report concluding that "it is now clear that electricity from Sizewell B will be substantially dearer than from coal-fired stations, contrary to the conclusion of the Inquiry inspector on whose recommendation construction was approved".

Public justifications for Sizewell B are now almost solely expressed in terms of more abstract and unquantifiable non-economic 'benefits' ("contribution to a reduction of greenhouse gases", "the maintenance of the nuclear option", "diversity and security of supply", etc).

Capital construction costs

On 25 June, 1990, FoE released a Nuclear Electric document (NEB 34) which revealed how capital costs of Sizewell B had increased from the original £1,691m to £2,030m (1987 prices). The papers were prepared by Brian George, Chief Executive of the PWR Project Group for a Board meeting of 7 June, 1990.

It does not allow for inflation, which if included would result in final payments of £2,621m.

It does not include interest repayments (estimated to be between £880m and £990m), which if included would raise the total to between £3,501m and £3,611m.

Finally it does not include £199m written off through "more prudent accounting policies", which covers "delays in commencement arising from the protracted public inquiry", "launch costs", "initial feasibility studies", some costs due to "organisational setting up" and safety standards set for the family of 4 PWRs which exceeded those required just for Sizewell B. If included the final total is between £3,700m and £3,810m.

Indeed the Energy Select Committee Report concludes that the "objectors at the Sizewell B Public Inquiry predicted the likely costs more accurately than the CEGB itself" (para 28).

Worse still, the contractors now effectively have Nuclear Electric 'over a barrel'. The Government commitment to continue construction means contractors will be able to charge whatever they can get away with - and they will - now that the opportunity of follow-on contracts for the 3 more PWRs has disappeared.

An independent review of the costs of Sizewell B by Coopers and Lybrand Deloitte estimated a capital costs increase not to £2,030m, but to £2,169m (6% more). Coopers and Lybrand estimate the additional claims from contractors to be £175m, while Nuclear Electric put this at £100m. The Financial Controller, recognising that these additional external factors were real, concluded that "there must remain a risk of a further increase".

Discounting the risks?

The discount rate is of fundamental importance to Nuclear Electric in determining prices and in appraising capital expenditure. Historically (and in 1987 when Sizewell B was approved), the CEGB enjoyed a public sector rate of return (discount rate) of 5%, sufficiently low to offset the high capital costs of nuclear power without exposing it to its inherent risks. An 8% figure is now used.

MacKerron and Henney both argue that nuclear power should be assessed on the same basis as if it were in the private sector (to prevent misallocation of resources) and this would lead to the use of at least 10% as the required rate of return.

The Energy Select Committee supported this position, making it a pivotal recommendation: "The rate of return used for appraising new

investment by Nuclear Electric should be linked not to the standard public sector discount rate but to rates of return expected in the rest of the generating industry, and the appraisal should take account of nuclear power's greater risk" (para 124).

In paragraphs 37 to 43 of the Report, the Committee catalogues the commercial risks which nuclear power is heir to: risks relating to domestic or overseas accidents; risks relating to changes in safety regulations; to construction delays; to poor operating performance; to nuclear back-end cost increases; to decommissioning cost increases; and risks relating to comparative prices of other fuels.

Public sector rates

Despite the fact that in October of 1989 National Power was arguing that nuclear power should carry a 10% current cost accounting rate of return, Nuclear Electric has now reverted to using public sector rates. In a press release, following the publication of the leaked Board papers (26 June, 1990), Nuclear Electric makes comparison only between costs arising from use of a 5% and those arising from use of an 8% rate of return. Such analyses continue to cause misallocation of resources. At a press conference on 26 June, Nuclear Electric sought to justify this using three arguments:

1. They criticised the short-term view of the City investors.

2. They claimed that public sector appraisals, which take account of social benefits ignored in the private sector, should be lower than private sector appraisals.

3. (Despite the fact that National Power considered 10% to be appropriate) They argued that 8% post-tax is appropriate for the risks of nuclear power.

So how much will the electricity actually cost? Variations in original assumptions have led to different conclusions as to the cost of electricity. While MacKerron estimates the PWR electricity to cost about 7p/kWh, Henney using a different basis for calculation, estimates the cost to be 5.8 p/kWh at 8% rate of return (7.2 p/kWh including capitalised R&D). At a 10% rate of return the figure rises to 6.6p/kWh.

Though the Energy Select Committee does not choose to put a single figure on the price of Sizewell B electricity, it notes with profound disturbance that National Power put costs at 6.25 p/kWh only months after the close of the Hinkley Point Public Inquiry at which the CEGB were arguing PWR electricity would cost around three times less.

Nuclear Electric itself, puts the cost at 4.8 - 5.7 p/kWh for an 8% rate of return[2].

The Department of Energy has used an unconventional method of calculating the cost of Sizewell electricity. In a letter from the Secretary of State, John Wakeham, to Dr Michael Clark, Chair of the Energy Select Committee, dated 26 June 1990, all the expenditure already incurred has been written off! The calculation is thus based on the supposed avoidable cost of £900m, giving a figure of between 2.64 p/kWh and 2.99 p/kWh. The Secretary of State concludes that this shows that Sizewell B is cheaper than a new coal-fired power station. The assumptions upon which he based the analysis are flawed. He uses for his central estimate an operational availability of 75%[3], a depreciation period of 40 years[4] and a very low avoidable cost which, it is presumed, did not include capitalised R&D or annual interest repayments.

EC twist

An unrecognised twist in the cost analysis involves the decision by the EC to limit the Non Fossil Fuel Obligation (NFFO) and premium prices to a period of 8 years ending in 1998 (*SCRAM 77*). Sizewell B will start earning premium prices in May 1996. This leaves only 2 years for it to receive premium prices. If it is assumed that post NFFO pool prices are sufficient to cover operating costs (about 2p/kWh), then the majority of the construction costs and interest must be recovered in the two years 1996-1998. This would result in electricity prices of about 25p/kWh for these years.

Despite the fact that none of the above cost estimates reflect the true costs of nuclear power, which would include allowance for accident liability, "a policy decision by Ministers" to continue Sizewell B has been made. As is now well known, the original Sizewell B Public Inquiry recommendation was primarily based on the plant being economic when compared to alternative fuels. Indeed Lord Marshall, when asked why the CEGB was opting for the PWR, said: "because it is the cheapest way to buy electricity"[5]. This case can no longer be sustained.

The result has been a public justification shift away from economics to the more abstract and, to a large extent, unquantifiable non-economic 'benefits' (eg security of supply and contribution to reducing greenhouse gases). This is characterised in the letter from John


Energy chief is in control

owned as carnival queen

Cecil Parkinson starting off the main construction work at Sizewell B; as reported in Sizewell B News, August '88

Wakeham to Michael Clark. However, though this is not the place to analyse these arguments, 3 points should be noted with respect to Sizewell B:

1. The marginal social and environmental 'benefits' of building one PWR is extremely small and can be achieved quicker, more cheaply and more safely by alternative methods (*SCRAM 69*).

2. These environmental benefits are easily offset by the higher environmental risks of nuclear accidents and radioactive waste.

3. Diversity of supply arguments are only relevant in the case of extreme movements in alternative fuel prices, which by definition have very low probabilities and which can be protected against by stockpiling and other initiatives. □

Notes:

1. House of Commons Energy Select Committee Fourth Report, *The Costs of Nuclear Power*, June 1990.

2. Nuclear Electric Press Release, 26 June 1990.

3. The July 1990 edition of *Nuclear Engineering International* gives the average lifetime load factor for large Westinghouse PWRs, similar to the type being built at Sizewell, as 60.9%.

4. The Energy Select Committee concludes that since banks would only be prepared to lend money on a 15 to 20 year basis (Evidence page 70), this should be the depreciation period for assessing nuclear power projects.

5. *World in Action*, 10 January 1983.

The introduction, by the National Energy Foundation, of a National Home Energy Rating, is welcomed by ANDREW WARREN, Director of the Association for the Conservation of Energy. The scheme will encourage energy efficiency considerations when houses, both new and old, are being bought and sold.

Home Energy Rating: a 'Good Thing'

IN the immortal phrase of *1066 And All That*, the National Energy Foundation is a Good Thing. Not only that, but there is every sign that it will prove to be an extremely effective thing. And, in a world where everyone professes interest in energy efficiency, but few do much about it, that can only be welcomed.

The Foundation itself has been several years in the formation. There is no doubting its genesis: it was the Milton Keynes Energy Park of 1986. Which was the much-publicised initiative to get 41 new homes built, in a designated area, which would prove to be far more energy efficient than usual.

Of itself, that was not so remarkable: back in 1982, the Milton Keynes Development Corporation had worked with BBC TV's *Tomorrow's World* to build a series of futuristic homes which incorporated the then-latest technologies for energy savings. They provided a splendid showcase for the technologies, but little more than that: ordinary housebuilders took one look, decided the homes in question were far too weird for their customers, and by inference rejected not just the houses but many of the energy saving devices within them.

Building on experience

By 1986 the Development Corporation had become rather more sophisticated. This time round a wide number of the big national housebuilders were directly involved in putting up the homes, and were actively encouraged to use their 'standard' models as the bases from which to work - with energy saving items duly grafted onto them. The whole idea was to get around the misapprehension that an energy efficient home somehow had to be a bit freaky to succeed. The Milton Keynes Energy Park got over that hurdle splendidly. Thousands of people came to visit the Park, including the Prime Minister, and discovered for themselves that low fuel bills did not mean having to adopt alternative lifestyles to succeed.

As a result, all new homes and offices contracted in Milton Keynes subsequently have adopted the same ethos. Even more important, elsewhere in the country larger builders have sought to duplicate the Milton Keynes experience by building homes which go well beyond the Building Regulations standards. Quite how much further beyond, and how to turn this into a positive marketing tool was always a more difficult question to answer. The Development Corporation had adopted an Energy Cost Index, which worked on an infinitely more sophisticated basis than the Building Regulations, with their simple mandatory U Values, and gave each one a score. The then-current regulations rated 170 on the Energy Cost Index, all homes on the Energy Park had to go below 120, and some, indeed, even went below 50. A splendid idea in principle, but understandably this generated some confusion: '170 or 120 what's?' people asked - or for that matter, is the lower or higher figure better?

New energy rating

The National Energy Foundation, formed as an independent charitable trust based at Milton Keynes, has set out to address precisely this problem. Last month the Prime Minister was involved, this time in promoting their National Home Energy Rating (NHER) Scheme. Based on the same model from the Building Research Establishment as the original Index, the new scheme is altogether a far simpler concept to understand.

Effectively the NHER rates homes on a scale of one to ten, according to their Energy Efficiency. The old Building Regulations score a rating of five (170 on the old index) the 1990 Regulations score six. Many older homes struggle to make two or three on the scale. However all homes built in Milton Keynes must have a NHER of a minimum seven, making them at least 20% more energy efficient than the amended Building Regulations* allow for in conventional homes. Those being built for the second phase of the Energy Park will be required to achieve a rating of eight.

What such ratings offer to developers is quite simply a new marketing tool when they are marketing an energy efficient home. Assessors look at the energy conservation features built into a home to produce the appropriate grade.

When combined with information on the size of the house, this can produce estimates of running costs - and thus the appropriate rating. It is therefore quite feasible to show how both the costs could lower, and the rating be improved by the addition of further energy saving measures.

Positive support

What is most encouraging about the Rating scheme is the positive attitude to it already being expressed by so many leading builders. It is surely an idea whose time has come, particularly when it is appreciated that the greatest benefit of this concept is that it can be used not just in new homes - which few of us will ever inhabit - but more important to provide a standard by which existing homes can be upgraded.

A couple of years ago the European Commission were touting a scheme which would require anyone selling a home to provide details of which energy saving measures were present to prospective vendors. Sadly it was UK energy minister Peter Morrison who vetoed the scheme - because at that stage such draft directives required universal approval from all member states to proceed.

Now, however, the position has altered, a weighted majority will be sufficient. So the EC propose to bring back the scheme later this year - and it will require more than just one reactionary posturing about "draconian intervention in the marketplace" to stop it. And with the home energy rating scheme, hopefully, up and running by then, we should have just the mechanism in hand to deliver this vital service. So you will appreciate why I say the National Energy Foundation is such a Good Thing. □

*** New Building Regulations are already in force for England and Wales and are due to be introduced later this year for Scotland.**

Evidence of low level radioactive waste dumping has been discovered by Friends of the Earthat the Inner Thames Marshes in Essex, a Site of Special Scientific Interest, earmarked for development as a movie theme park. PATRICK GREEN, FoE Radiation Campaigner, outlines the findings which have been dismissed by the Government as a "crude publicity stunt".

Amenity-ville Horror

THE Inner Thames Marshes at Rainham in Essex constitute the largest remaining area of wetland with a rich variety of wildlife along the Upper Reaches of the Thames Estuary. Nearly 1,200 acres of the Marshes were designated as a Site of Special Scientific Interest (SSSI) by the Nature Conservancy Council in 1983.

Inland the Marshes are bounded by the railway line running into Fenchurch Street Station, separating them from Rainham village. To the East lie the Ministry of Defence firing ranges (co-operation from the MOD has maintained the conservation interest of this section of the SSSI). In the west the marshes come up against the area of "special industry" - metal smelting works, fertiliser manufacturing plants etc. Towards the river, the marshes have been blocked off from the Thames by the rising mound of land used historically and currently for landfill. Much of this land is known to be contaminated with chemical waste from past dumping.

The area has also been earmarked for a massive development by the Music Corporation of America (MCA) and British Urban Developments (BUD) who want to build a movie theme park that will destroy 66% of the SSSI.

Havering approval

All the major conservation organisations, from Friends of the Earth to the Royal Society for the Protection of Birds, and both the statutory bodies for nature and landscape conservation, the Nature Conservancy Council and the Countryside Commission, have objected to the proposed development and asked the Secretary of State for the Environment, Chris Patten, to call in the planning application for a planning inquiry. He refused, and Havering Borough Council, who own part of the site, granted the developers outline planning permission in April.

So, what has all this got to do with the FoE Radiation Campaign? In March this year FoE was sent a bundle of letters, dating from the 1960s, which suggested that radioactive waste from the Laporte Site in Ilford had been dumped there. This material was duly placed in the public domain.

Neither the developers "environmental statement", nor the report of Havering Borough Council on the proposed development, make any mention of radioactive waste being dumped on the Marshes. The DoE dismissed FoE's concerns, maintaining that it had no record of waste ever being dumped on the Marshes. Havering Borough Council were reported as commenting: "In a nutshell we don't believe the FoE documents, MCA can be accommodated on the site without disturbing any areas that could have been used for domestic or industrial refuse".

In fact, the heart of the movie park will be a film studio. This will be built directly on top of the landfill site.

Radioactive slag

Following the publication of the letters the saga continued when FoE received another anonymous package. This time it was a piece of radioactive metal slag allegedly from the Marshes! Her Majesty's Inspectorate of Pollution (HMIP) were called in to remove this.

In early June the FoE Radiation Monitoring Unit carried out a two day survey of the Marshes and discovered evidence that very large volumes of low level radioactive waste have, despite the claims to the contrary, been dumped on the Marshes.

This survey identified four areas of contamination, in one place it seemed that the sea wall was actually constructed out of the waste! The FoE survey did not cover the entire area of the proposed development and it is highly likely that waste has been dumped in other areas.

The radioactive waste found had the physical properties of a slag like rock from mineral/ore processing eg. smelting. The pieces of slag produced count-rates of up to about 200 times background.

One of the lesser pieces of slag, was analysed and was found to contain 2,000Bq/kg of Uranium-238 and Thorium-232, ie. up to 40 times the average background levels of these radionuclides. Assuming that these radionuclides were present in equilibrium with their daughter products, this piece of slag would have had a total activity of 5,400Bq/kg of Thorium; 3,400Bq/kg of Radium and 4,000Bq/kg of Uranium. On the basis of the radium and thorium levels this material would be classed as low level waste and would need to be disposed of at Drigg.

The Government's response to this discovery was predictable. The Junior Environment Minister, David Heathcoat-Amory, totally ignored the issue of why his department knew nothing about this waste and dismissed the FoE action as a "crude publicity stunt".

MCA attempted to change its arguments and maintained that they knew about the waste. In fact, they only commissioned a radiological survey of the Marshes after FoE first suggested that waste had been dumped there. This study has yet to be published.

Several important questions remain to be answered over this waste. Namely, what is it, where did it come from and when was it dumped? Even more importantly, why didn't HMIP know anything about it?

Secrecy

One of the companies in the special industry area next to the Marshes is MUREX Ltd. They are a smelting works and have an authorisation under the 1960 Radioactive Substances Act (RSA 1960) to dispose of radioactive waste. Although they have denied that the waste came from them, various anonymous rumours suggest otherwise. However, once again we return to the secrecy clause under the RSA 1960 - MUREX do not have to reveal anything about their activities.

In early July, Frank Feates, the Chief Inspector of HMIP, wrote to FoE confirming that his department has no records of waste being dumped on the Marshes. His letter concluded: "I must remind you that to knowingly remove any material which formally constitutes radioactive waste without authorisation is a statutory offence"!

Clearly, HMIP does not want FoE on the Marshes. □

Throughout the 1980s local energy projects made impressive progress based on an imaginative approach to gaining Government funding; they have draughtproofed almost 700,000 homes in the UK. This, many agree, has just been 'tinkering' with the problem of fuel poverty. BILL SHELDRICK* argues that it is time the projects were backed with political will and money which would enable them to tackle the dual problem of fuel poverty and the greenhouse effect and go beyond draughtproofing.

Beyond draughtproofing

A recent report published by Heatwise Glasgow, Neighbourhood Energy Action, Friends of the Earth, and the National Right to Fuel Campaign addressed the issue of the greenhouse effect and the fuel poor[1]. An underlying tenant was that carbon dioxide (CO_2) emissions could not be tackled by a carbon tax alone. Rising fuel prices by any other name - whether to remove the distortions in the market, to prepare for privatisation, or to reduce pollution - are still rising fuel prices. Without complementary policies, increasing prices only exacerbate the fuel poverty trap, in which an estimated 6.4 million households are caught.

The report advocates, amongst other recommendations:

- that 500,000 'low income' houses are upgraded annually at an average cost of £2,500 (and completed by 2,005);
- that the minimum standards should be thermal standards of the 1990 Building Regulations, combined with gas central heating and double glazing;
- that electric space heating should be phased out immediately, where safe, less polluting and acceptable alternatives are available;
- that welfare benefit levels and rents should reflect the energy efficiency standards of the dwelling.

The report's aim is to redress simultaneously the problems of poor insulation, unnecessarily expensive heating and environmental pollution - no small task, but one that, if implemented, would represent a radical change in UK energy conservation policy. How dramatic a change can be seen by a critical examination of some of the achievements to date.

Throughout the 1980s, a network of local energy projects operating under the banner of Neighbourhood Energy Action (NEA) became one of the jewels in the crown of UK energy conservation policy. They have completed almost 700,000 draughtproofing jobs across the country, in the last decade: no mean feat given the patching together of grants and other resources that have enabled the work to evolve. However, while local energy projects have provided a valuable service to the unemployed, the elderly and those on low-incomes, when compared to the size of the problem, draughtproofing is only tinkering at the margins.

Narrowed horizons

In growing from 5 projects in 1981 to over 400 by 1988, draughtproofing projects came to be supported by the Government, not because of any intrinsic value in insulation or because of a national commitment to improving the thermal characteristics of housing stock, but because of temporary employment schemes. This system, in allowing the energy projects to flourish, has also narrowed the horizons of many projects as well as introducing and reinforcing a dependency culture.

While local authorities have issued over 3.5 million loft insulation grants, very little of this work has been carried out by local energy projects; draughtproofing has outnumbered loft insulation jobs by 10 to 1. Energy advice, if provided by a project at all, has been of even lower priority for most projects. Concentrating on draughtproofing has been a much easier option.

Draughtproofing is relatively cheap and simple to install. But, most importantly, it is also where the money has been, first through the DHSS Single Payment system, and subsequently through the Energy Grant. Funding has not been as readily or attractively available for other activities. Thus, projects concentrate on draughtproofing because that is where the grants are, but other grants are not available because the projects concentrate on draughtproofing - Catch 22!

Draughtproofing vs Insulation

So successful have the energy projects been in delivering draughtproofing that the Government has also been able to hide behind it. When faced with criticism about its lack of commitment to energy conservation, the Government has pointed out that, as a direct result of its support, over 700,000 homes across the country have been "insulated" by local energy projects. In contrast to the Government's claim, NEA's figures refer to the "number of draughtproofing jobs completed". "Insulated" is certainly less of a mouthful; it also sounds better. By implication, if the house is "insulated", more insulation is unnecessary. This logic would explain the almost complete lack of other Government programmes to improve the insulation standards within the existing housing stock.

The treatment of the existing housing stock (or should I say the lack of it) can be contrasted with that of new dwellings. The revised thermal standards of the Building Regulations came into effect in England and Wales in April (and will come into effect in Scotland in February 1991). To meet these new standards, in practice, a new dwelling will require 150mm of loft insulation, at least 50mm of insulation in external walls, and about 50mm of insulation under the ground floor. When compared to these standards, sticking bits of plastic around windows and doors hardly constitutes a house being "insulated".

The Building regulations, however, only apply to new houses. Although they will eventually bring the dwelling stock up to a minimum insulation standard, it will not be for some time. 75% of the existing stock was constructed before 1964, the first year mandatory insulation standards were included within the Building Regulations; over 20% of the present

stock was built before 1919. With new houses generally accounting for less than 1% of the total stock in any one year, houses built before 1964 will still account for over 50% of the UK housing stock in 30 years time.

Pre-1964 dwellings are a priority for any serious programme to upgrade the thermal characteristics of the UK housing stock, whether the intention is to overcome the problems of fuel poverty, to reduce environmental pollution, or to reduce the use of non-renewable resources. An uninsulated brick-cavity-brick wall will lose heat at over three times that of a wall built to 1990 standards; a 220mm solid brick wall over 5 times as much. While it is easier to include higher insulation standards within new buildings, the potential reductions through a retrofit programme are quite significant. Fuel consumption can be reduced by 80% or more in some house types, through installing adequate insulation and appropriate heating.

Easterhouse project

How much can be achieved in existing housing is illustrated by the major refurbishment of a six-flat tenement in Easterhouse, Glasgow. Prior to the improvement work, to heat these flats to a reasonable temperature would have cost the tenants an average of £20 each week of the year. From being a cold and damp tenement, this building has been transformed, through the installation of whole house heating, reducing the heat loss through the walls from 2.4W/m^2°C to less than 0.3. This involved putting 100mm of insulation beneath the ground floor and 200mm of insulation in the loft, replacing the badly fitted metal-framed, single glazed, windows with uPVC double glazed units, and incorporating two passive solar buffer spaces, including a conservatory extension on the south facing elevation of the building. As a result of these improvements, the cost of heating will be reduced by almost 90% and the heat loss by 80%. Tenants will now be able to heat their whole house, not just one room, for only £2 per week![2]

By way of a contrast, draughtproofing on its own would have made only a small improvement in the achieved mean internal room temperatures and reduced the heat loss and the fuel bills by an estimated 10%; the occupants would still have had to pay about £18 a week. Draughtproofing is not, and should not be used as an end in itself. While it should be an element within a comprehensive insulation strategy, it should not be the only element.

Easthall pilot project in Easterhouse, Glasgow

New funding

Compared to draughtproofing, comprehensive thermal improvements are not cheap - with the Easterhouse refurbishment, the heating and insulation improvements alone (excluding the passive solar components) cost about £5,000 per flat. To go beyond the basic insulation measures, funding in addition to the Energy Grant of £49.50 and the Home Insulation Scheme of £144 is required.

The Minor Works Grant within the new Home Improvement Grant system came into effect in England and Wales in April 1990. Allowing for a 100% grant up to £1,000 per application and up to three applications in a 3 year period, for unspecified insulation improvements, it could represent a significant step forward in energy conservation policy. Unfortunately, the potential impact of the Minor Works Grant is severely limited by the eligibility criteria, and its discretionary nature.

The indication is that local authorities already see it as a replacement grant for draughtproofing and loft insulation works, a situation that is not assisted by the generally qualified guidance published by the Department of Environment[3]. Even then, the situation is still better in England and Wales than in Scotland, where a similar revision of the Home Improvements Grant system appears to have been shelved indefinitely, due to a shortage of time in the parliamentary timetable.

The forthcoming Home Energy Efficiency Scheme (HEES) provides an opportunity to build on the advances made in the Minor Works Grant. While the final arrangements are still being worked out, it appears unlikely that the new grant will offer much more than funding for basic insulation improvements, as set out in the February 1990 White Paper. The support, that emerged during the HEES consultation process, for a more wide ranging grant does not appear to have moved the Energy Efficiency Office (I hope I am being unduly pessimistic).

The success of the local energy projects in devising, and delivering, a nationwide draughtproofing service puts paid to the view often cited by the Government as justifying its lack of a more interventionist energy conservation policy - that it cannot effect the behaviour of individuals other than through the market mechanisms (a euphemism for raising fuel prices). The market, however, has not worked very well for the fuel poor, other than to exacerbate the level of hardship. Local energy projects provide the basic infrastructure for upgrading the insulation standards of the housing stock of those on low incomes. To go beyond draughtproofing to address recognised local, national, and global problems requires both funding and vision from the powers that be. Hopefully, it is not too much to expect. □

Notes

*** Bill Sheldrick is the research develpment officer for Glasgow Heatwise but is writing in a personal capacity.**

1. B Boardman (1990), *Fuel Poverty and the Greenhouse Effect*. Available from Heatwise Glasgow, 8 Elliot Place, Glasgow G3 8EP, £5.

2. Heatwise Glasgow (1990) *An ERA of Partnership*, Heatwise Glasgow.

3. Department of the Environment (1990) *Assistance with Minor Works to Dwellings*, DoE circular 4/90, HMSO, London.

THORP: Sellafield's new threat

Sellafield is about to unleash a new threat to the surrounding area - the Thermal Oxide Reprocessing Plant. Cumbrians Opposed to a Radioactive Environment organised a conference, in Liverpool, to discuss the threat. Delegates were invited from communities bordering the Irish Sea, on the transport routes for spent nuclear fuel travelling to THORP, and on the possible transport routes for plutonium going back to the country of origin. SIMON BOXER and MARTIN FORWOOD, of CORE, report on the background to the conference.

THE Thermal Oxide Reprocessing Plant (THORP) is being constructed at Sellafield (to be operational in 1992) to reprocess the spent nuclear fuel arising from the more modern generation of nuclear reactors - Advanced Gas-cooled Reactors (AGRs), Pressurised Water Reactors (PWRs), and Light Water Reactors (LWRs). The uranium fuel for these reactors is 'enriched' (enrichment is a process which increases the U-235 concentration in the natural uranium - which is mainly U-238 - to make the fuel more readily 'chain-reactive') and is in the form of a ceramic oxide rather than a metal. This type of fuel is therefore called oxide fuel.

Reprocessing oxide fuel involves essentially the same processes as Magnox reprocessing, with two important differences. First, the cladding of oxide fuel is either stainless steel or a zirconium alloy and cannot be stripped off mechanically in the way that the magnesium alloy cladding on Magnox fuel is. Instead, the entire fuel element is chopped into short lengths. It is then put into acid which dissolves the uranium oxide fuel (the chopped metal cladding is sieved out and stored as Intermediate-Level Waste). The dissolved uranium oxide is then chemically treated, as with Magnox fuel, to separate out the uranium, plutonium and fission products.

Secondly, oxide spent fuel is ten times more radioactive than Magnox spent fuel. The House of Commons Energy Select Committee (HCEC) in 1986 observed: "The intense radiation (of oxide spent fuel) damages the solvents and attacks process plant; at the same time it makes direct maintenance extremely difficult, if not impossible."

In the late 1960s BNFL converted the military reprocessing plant, B204, which was built to separate out plutonium from the spent fuel produced by the original Windscale 'piles', into a Head End Plant to reprocess oxide spent fuel. It operated from 1969 until September 1973 when an unexpected chemical reaction in a process vessel caused a serious 'blow-back' accident, severely contaminating 35 workers and the building. It has never re-opened. Based upon this limited oxide reprocessing experience BNFL then put forward plans to build THORP. The go-ahead for construction was given after the 100 day 1977 Windscale Public Inquiry.

Also, in the late 1970s the United States abandoned its oxide reprocessing programme because of technical and economic problems. West Germany abandoned construction (with £1 billion already spent) of its plant at Wackersdorf, Bavaria, in 1989, because strict environmental and safety standards made the project uneconomical. Only France, at La Hague, currently operates an oxide reprocessing plant (UP2-HAO). Not, however, without difficulty. Its throughtput is only 40% of that planned and there have been several technical incidents. Japan's plans to build one have met massive opposition from the local population and elected representatives. The HCEC (1986) in their report on radioactive waste stated "The US does not carry out any civil reprocessing. Nor do Sweden, Canada, Switzerland, or Finland. That major nuclear nations such as Canada, the US and Sweden should not find civil reprocessing necessary, commercial or economic is significant."

Need for THORP?

When, in 1986, the HCEC examined the need for THORP they made many statements which undermined the justification for reprocessing, especially of oxide fuel. Their final recommendation on oxide reprocessing was as follows:

"(i) BNFL and the Department of Energy should prepare and publish a detailed analysis of the financial consequences of abandoning THORP, including a study of alternative use of already committed capital investment for the interim storage of contracted foreign spent fuel;

(ii) BNFL and the Department of Employment should prepare and publish a study of the alternative ways in which manpower involved in the construction of THORP could be re-employed on alternative 'cleaning-up' work on the Sellafield site or on work elsewhere;

(iii) If the results of the studies recommended in (i) and (ii) above show that the consequences of the

abandonment of THORP do not warrant a continuation, THORP should be abandoned as a potential reprocessing plant."

Needless to say the Government and BNFL chose to ignore these recommendations.

Dr David Lowry, an Environmental Policy Consultant who will be familiar to SCRAM readers, opened the conference by focusing on the implications of the current importation of foreign spent fuel for reprocessing at THORP. 70 to 80% of the fuel to be reprocessed in THORP will be foreign. Evidence from Parliament and from details of the recently signed West German contracts with BNFL indicate that Britain will be left to deal with a large amount of the nuclear waste resulting.

Not only will all the high level (HLW), intermediate level (ILW) and low level waste (LLW) from reprocessing of foreign spent fuel contracted before 1976 (before the Government included 'return-to-sender' clauses in contracts) stay in this country, but ILW and LLW resulting from contracts signed after 1976 may well stay in Britain too. Evidence suggests that a substitution of a much smaller quantity of vitrified HLW (to the same radioactivity content) will be made for the larger quantities of ILW and LLW from the reprocessing of foreign spent fuel. As it is ILW and LLW that are causing Britain's nuclear waste problems, at present, the extra foreign waste can only exacerbate the difficulties which Nirex face in locating a site and building a repository (dump).

Colin Sweet, an Independent Consultant in Energy Policy, Economics and Management gave an economic appraisal of the THORP project, from the information available in the public domain: even the Inspector at the 1977 Windscale Public Inquiry concluded that THORP would be a loss maker. However, BNFL have yet to reveal to Parliament and the public the true extent of the loss they will make. By assessing the total costs of THORP and comparing this to the income secured from contracts signed so far, a substantial loss can be demonstrated. The economic rationale for oxide reprocessing is very weak, especially in the reuse of uranium recovered. With the cost of freshly mined uranium falling substantially since the 1977 Inquiry, and the costs of reprocessing increasing dramatically, the economics of using reprocessed uranium in the nuclear fuel cycle is virtually prohibitive.

Evidence from BNFL's own accounts show how the THORP expansion has severely affected the company's economic viability. The 1988 House of Commons Energy Select Committee report on BNFL's accounts noted that, since their current liabilities exceeded current assets by £100 million, the company is technically insolvent.

Marine contamination

Despite reductions in marine discharges to the Irish Sea, the coastal environment of Cumbria is still contaminated at levels unique in the world- wide experience of nuclear power, according to Dr Peter Taylor, Director of the Political Ecology Research Group. The contamination even exceeds that found at nuclear weapons test sites. Sellafield alone accounts for 87% of the public exposure in the whole of the European Community from radioactive liquid discharges. This contamination could have been avoided by using discharge reduction technology that was available when the Magnox reprocessing plant was designed.

Changes have been made to some of the parameters used by the Ministry of Agriculture, Fisheries and Food (MAFF) to assess the dose to the most exposed local sea-food consumers. For example gut transfer rates are now thought to be higher, but MAFF has not re-calculated the dose to the most exposed consumers retrospectively. There is therefore a strong possibility that radiation dose limits were exceeded in the past, for at least several years.

Evidence from BNFL shows that THORP's discharges will not meet the Best Available Technology standard (ie zero discharges) as required by international treaties.

A containment failure of one of the liquid HLW storage silos at Sellafield would have enormous economic and social consequences in Britain and for Irish and North Sea fisheries.

Krypton-85

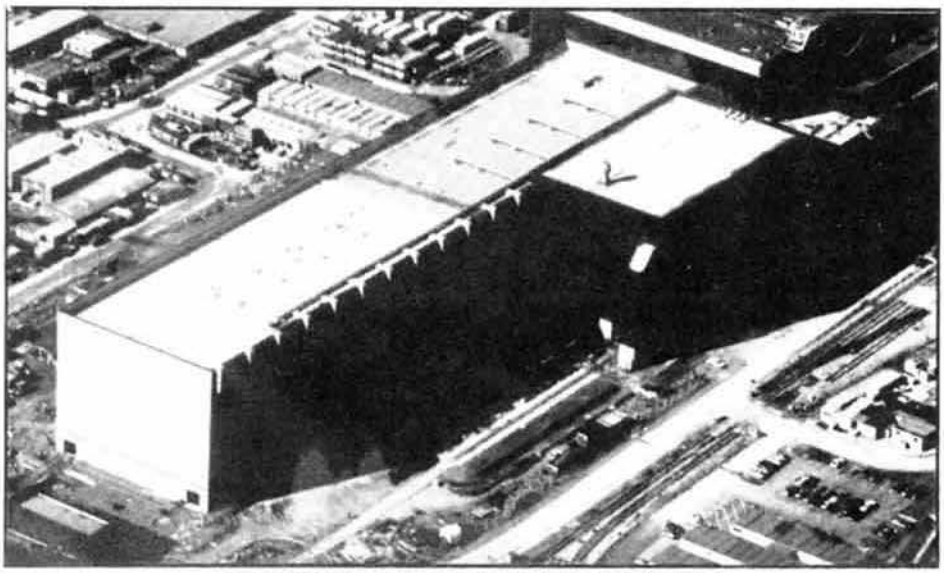
US research shows that radioactive Krypton-85 gas releases from reprocessing activities world-wide, to which THORP will make a considerable contribution, has the potential to significantly alter important global atmospheric processes. The precautionary principle would require the installation of Krypton-85 retention technology.

Since plutonium is the fissile material used in most nuclear weapons, the increase in production and the international transport of plutonium from THORP means that serious nuclear weapons proliferation concerns exist. Jonathan Spink, of the European Proliferation Information Centre, pointed out that, with such important safety and proliferation issues at stake, the security surrounding any future shipments will be extensive and might infringe civil rights in this country.

The conference of over 100 delegates, including Local Authorities, Politicians, Trades Unions and environmental organisations, from six countries bordering the Irish Sea, closed by expressing "its extreme concern regarding the reprocessing plant at Sellafield and the development of THORP". Delegates agreed to form a network for all those communities at risk from the future operations of THORP, which will be co-ordinated by CORE, to improve international links and communication between the organisations and individuals involved. □

Note

The Conference Report will be available by mid-August from CORE 98 Church Street, Barrow in Furness Cumbria.



The THORP reprocessing plant at Sellafield

As evidence has emerged of the extent of the danger from radon gas, the Government's response has been to make it more difficult for householders to obtain grants to treat their homes. PATRICK GREEN, Radiation Campaigner with Friends of the Earth (England and Wales), calls for a rolling programme for treating the worst affected houses.

Radon gas means tested

RADON gas, a naturally occurring radioactive gas, is now considered by the National Radiological Protection Board (NRPB) to be responsible for 2,500 cases of lung cancer per year. In the USA radon is viewed as the second biggest cause of lung cancer next to smoking. Yet the UK Government has just made it more difficult to obtain a grant to pay for the necessary remedial work. Three years ago (*SCRAM 61*) I wrote that the Government was not taking the issue seriously. Obviously nothing has changed.

Earlier this year the NRPB halved the level at which it recommends action should be taken to reduce radon exposure in the home. Remedial action is now recommended at an annual exposure of 10mSv.

This might seem like drastic action but considering this new level produces a 3% increase in the lifetime risk (equal to a 1 in 30 chance) of developing a fatal lung cancer it is clearly not enough.

Furthermore, this level of exposure is still 20 times higher than the limit recommended by the NRPB for public exposure to radiation from nuclear sites.

There is also now evidence that exposure to the daughter products of radon may cause other cancers. A study published in April by scientists at Bristol University, has linked radon gas to leukaemia. It finds a strong positive correlation between national average radon levels and national leukaemia rates (*The Lancet* 28 April 1990).

While this study cannot be taken as 'proof' that radon causes leukaemia, in fact the NRPB have totally rejected its findings, it does provide further evidence of the seriousness of the radon problem. Further work in this area is urgently needed.

The exposure to high levels of radon also seems to be far more widespread than first thought. The Government, acting on the NRPB's advice, maintain that the worst affected areas are in Devon and Cornwall. However, surveys conducted by the Institute of Environmental Health Officers have suggested that many other areas of the country could be affected.

The NRPB scenario is bad enough. They estimate that 100,000 homes have radon concentrations above the new action level. Yet in its recent evidence to the House of Commons Environment Select Committee it reported that with its present number of staff it would take until next century to identify all of them!

This is totally inadequate. The NRPB and local authorities should receive sufficient funding so that high radon houses can be identified as a matter of urgency. One does not say to a smoker give up smoking in ten years time. The NRPB action level should be reviewed every two years and gradually reduced as the worst homes are treated. An eventual target should be no-one receiving a higher annual dose than the current national average radon level, which is around 1mSv per year.

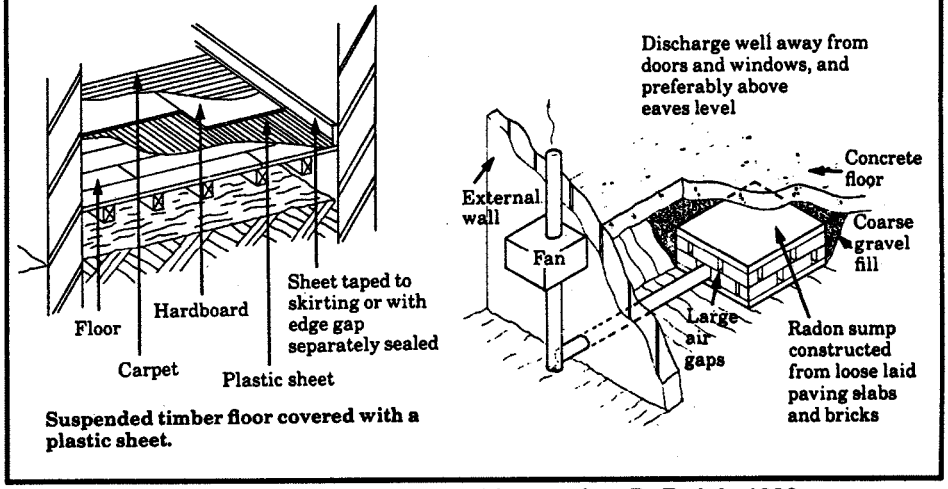
Remedial action is not expensive. The Building Research Establishment (BRE) estimate that radon remedies are likely to range from less than £200 for a DIY job of sealing up cracks in the floor to over £1,500 per house.

The current Government position is that householders are responsible themselves and that help is in principle only available in the case of hardship. Until July, householders could apply for discretionary grants from their local authority to pay for the work. Now the Government has introduced a system of means testing for these grants which in practice means that only those on housing benefit will be able to get one. This, again, is totally inadequate. Mandatory grants should be available.

The responsibility for remedial measures currently rests with the house owner or landlord. There is no legal provision for tenants renting property to demand either a test or, where applicable, remedial action. This position is inequitable. There should be a legal framework eg. a clause in the standard tenancy contract, requiring landlords to test property at the request of tenants and where applicable take remedial action. Tenants should have the right to radon free housing.

Tackling the radon problem is largely a question of political will and providing the necessary funding. The costs of avoiding premature death due to radon are only £11,250 per life. Yet the Government seem to be totally unwilling to give radon the priority it needs.

The nuclear industry continually seeks to justify its activities by comparing the resultant exposures with those from radon gas. Perhaps this is why the Government is reluctant to give radon the priority it needs. If radon, a natural source of radiation exposure, is a health hazard, should we really be adding to it by discharging radioactive waste into the environment? □



Suspended timber floor covered with a plastic sheet.

From: *The householders' guide to radon*, DoE, July 1990

JOHN TWIDELL, Director of the Energy Studies Unit at Strathclyde University, argues that the energy is in the north but the playing field slopes south. Here he presents a case for a renewable energy tranche in Scotland, and suggests that "direct programmes of renewable energy development be instituted in Scotland and Northern Ireland for the sake of commercial fairness and for the future clean-energy sources".

The playing field slopes South

AN opportunity for commercial renewable energy supplies arises indirectly in England and Wales with electricity privatisation. The Non Fossil Fuel Obligation (NFFO) - England and Wales - requires that about 20% of electricity be generated from sources other than coal, gas and oil. Most, about 10,000MW, will come from nuclear power, but there is also a provision for 600 MW of non-nuclear power within "the Renewable Energy Tranche".

The NFFO has an associated programme of financial support. The main beneficiary is the state nuclear generator, but there is also assistance for private generators. Fossil fuel generation is taxed and the money used to assist the non-fossil fuel generation. Thus for each unit of electricity sold, under the NFFO, the generator will receive about 4p from the customer and a further 2p from the tax, to give a total income of at least 6p.

Renewable energy proposals accepted by the Department of Energy receive the same financial assistance of about 2p/unit as the nuclear suppliers. It seems that about 400 projects for renewable energy were submitted for the first allocation. These included landfill gas, tidal power and about 200 wind farm proposals. The government has decided that the NFFO payments will only be made to generators in England and Wales. Power imported from Scotland cannot receive payments from the fossil fuel tax.

Wind power generation

For wind power, the renewable energy tranche is the first UK programme leading to commercial wind farms. In California and Denmark especially, there are already 10,000 wind turbines producing electricity on wind farms or in small groups to a total capacity of over 1000MW. In addition there are 1,000 machines exporting to the grid as single machines. However, as yet, there are only about 15 such power-exporting machines and no wind farms in the UK.

The installed cost of 1 MW capacity of wind power is about £1 million, ie. less than nuclear and about the same as modern coal plant. UK wind turbine companies have had to compete for these new and expanding markets overseas rather than in their own country. This is a huge handicap, made ironic because of the excellent wind resource in the UK and the universal aim for alternative power free of waste emissions.

The Renewable Energy Tranche of the NFFO in England and Wales provides the first opportunity for UK wind turbine manufacturers to bid for contracts in the UK. This opportunity is welcomed, even though the winds of Scotland give a better economic provision.

Scottish renewables

Scotland has the largest renewable energy potential of any part of the UK. Already 1,200 MW of hydro-electric capacity is connected to the national grid, providing the cheapest power in the UK. Without this an extra 4 million tonnes of carbon dioxide would be emitted annually. The untapped resources include more hydro, wind, wave and some tidal power. All of these resources are vital to fulfil the UK's requirement for non-polluting energy.

The Scottish wind resource has the most immediate significant potential. The best and most acceptable sites are on flat and gently rising land; not on mountain peaks and ridges. Good sites, likely to be accepted on environmental criteria, are to be found in Caithness, South Uist, Orkney and on the western and eastern mainland coasts. One of the best sites is in the immediate area of Dounreay, where diversification is needed within the DoEn Establishment.

The European Wind Atlas, sponsored by the European Commission to determine the wind power potential, shows that Scotland has the highest consistent wind speeds necessary for economic generation of electricity. By Danish standards payback on investment at commercial rates would be within 6 years on many sites. Sites with average wind speeds of 8 m/s are available in Scotland, which compare with equivalent sites in England of 6 m/s. A wind turbine on the Scottish site would produce twice the electricity as on the English site because the power in the wind increases with the cube of the wind speed.

Institutional barriers

The two Scottish private power companies, Scottish Power and Hydro-Electric, are receiving long lasting capital equipment at low commercial terms. The combined electricity capacity with Scottish Nuclear is nearly twice that required in Scotland, by modern standards, and the electricity 'interconnector' grid between Scotland and England is limited in capacity. The result is that the Scottish utilities have no interest in extra capacity, whether it is their own or belonging to a private competitor. This position is denying ab-initio private generation.

The Acts privatising electricity compel the utilities to purchase private power, but at marginal rates. In Scotland the payment to private generators is now between 1.5 and 2p per unit. Whereas in England and Wales the equivalent payment within the NFFO is expected to be 6 to 7p per unit. The Scottish payments make it quite impossible to justify private power investment of any kind.

Renewable programme

It is unacceptable within a United Kingdom that unfairness by a factor of three exists to the favour of England and Wales. Therefore equivalent programmes should be on offer in Scotland and Northern Ireland. Within the UK the sites of best potential should be harnessed, not just those in England and Wales.

A Non-Fossil Fuel Obligation for Scotland would have a different underlying purpose than England and Wales because Scottish electricity is 10% hydro and 50% nuclear generated. The fossil fuel generation has not been taxed and has, moreover, been safeguarded with guaranteed arrangements vis-a-vis the State nuclear supplier. The Scottish privatisation arrangements have, in any case, gone too far to be changed.

Therefore, Scotland should have a straightforward programme to develop commercial, pollution-free, renewable energy supplies. The market in Scotland is necessary to establish Scottish products and skills, and to prepare for the closely impending requirement for less UK gaseous effluents. Clearly there will be a world market for clean energy plant, so experience gained with the excellent potential in Scotland will be advantageous. Without such experience and without a fair programme of financial assistance, Scottish industry will be severely handicapped.

With regard to wind power, it is obviously nonsensical to ignore the best sites for economic generation in the whole of Europe. It seems that wind power is being developed everywhere in Europe, except Scotland. An immediate and direct programme for, say, 100MW capacity of Scottish wind power would not perturb the present generation, yet would provide the stimulus to begin harnessing this necessary and sustainable resource. □

Acid House party

Two Commons Select Committee Reports were published in June. *The Cost of Nuclear Power* received a great deal of media attention, however, *The Flue Gas Desulphurisation Programme, perhaps because of the catchy title, was ignored.**

MIKE TOWNSLEY discovers that while the acid rain problem deepens the Government's commitment - or stated commitment - to a clean-up programme is dissolving.

GOVERNMENT support for the European Community Large Combustion Plant Directive (LCPD) has always been dubious. Passed in 1988, the Directive binds the UK to a 60% reduction in sulphur dioxide (SO_2) emissions, from their 1980 levels, by 2003. Instead of eliciting a definitive statement on Government policy, the House of Commons Energy Select Committee, investigating the clean-up programme, had to settle for vague murmurings about 8,000MW of flue gas desulphurisation (FGD), 10,000MW of new Combined Cycle Gas Turbines (CCGT) and low-sulphur coal imports. This represents a reduction in planned FGD of 40% - wiping a commitment to spend 800 million from the soon to be privatised electricity boards' portfolios.

The nuclear industry is not the only sector of the electricity supply industry (ESI) which has proceeded without close monitoring or planning from the Department of Energy (DoEn). The Committee comments: "Whereas billions of pounds have been spent on nuclear R&D, giving rise so far to a small, heavily subsidised, sector of the ESI, R&D which could have improved the efficiency of coal-fired generation (78% of the total generation in England and Wales in 1988-89) has been starved of the comparatively small amounts of money needed, and now that the need for clean-burning coal technology is made urgent by SO_2 emissions limits the technology is not available within the required time scale."

When making her infamous 'Green' speech to the United Nations in November last year, Mrs Thatcher claimed "we already have a £2 billion programme of improvements to reduce acid emissions from our power stations". This, along with many other broken promises about the clean-up since the mid 1980s, has led to the belief that Government commitment to FGD was tactical rather than sincere. Because FGD is expensive and takes around 6 years to retrofit - in this country at least - the European Community allowed the UK smaller reduction targets than its European partners, despite the UK being the largest producer of SO_2 in Europe. The UK must meet a 3 stage programme of emissions cuts: 20% by 1993, 40% by 1998 and 60% by 2003. West Germany, France and Belgium, for instance, have a target of 70% by 2003.

A memorandum submitted to the Committee by the DoEn argues, "it has always been recognised" that low sulphur fuels would play a part in meeting the UK's targets. However, N. Sanders, of the Department of Environment's Air Quality Division, admitted "there was no explicit account taken of it". Indeed, the European Commissioner for the Environment, Carlos de Mena de Ripa, told the Committee that "During the discussion with the UK governmental and industry representatives the Commission was told that the reduction targets imposed upon emissions from existing plant would above all be achieved by retrofitting some plants with FGD.

"Other routes of decreasing SO_2 emissions were not ruled out but their likely contributions to the achievement of the reduction targets were not considered as being substantial... In any case the justification for the relatively weak reduction target set for the UK for 1993 was governed by the practical difficulties of bringing into operation by that date the necessary FGD units."

Coal imports

Although superficially the Government's new approach appears to make sense, it does so only in the short term. Much criticism was heaped upon the plan to import coal, the Committee expressed its concern over the effect such a plan would have on the already beleaguered mining industry. British Coal (BC) calculate that if only 8GW of FGD - 4GW each from National Power and PowerGen - is in place by 2003, their sales to the two large generators will fall from 70 million tonnes to 38 million tonnes. Using the BC 'rule of thumb' of 1,000 employees per million tonnes produced this will result in a loss of 32,000 jobs by 2003.

British Coal would have to cut their prices by between £5 and £6 per tonne, to make FGD and home produced coal a more attractive proposition. However, given that they are expected to announce an operating loss of around £500 million this year, it seems unlikely they will be able to meet the generator's terms.

While FGD is undoubtedly expensive - it adds 0.5p onto the unit price of coal generated electricity, taking the total cost to 3.5p/kWh - it is capable of reducing SO_2 emissions by over 90%. Low sulphur coal can, at best, achieve a 50% reduction. It is likely that the low-sulphur coal will come from Colombia or South Africa - the Drax coal-fired power station has already taken a delivery of Colombian coal - where the miners have no such 'luxuries' as decent wages or working conditions, and where environmental considerations have a low priority. British miners are paid a fair wage and work in reasonable conditions, and the mining itself conforms to strict environmental standards; yet because of this the British coal industry is being priced out of the market.

Surely there is something seriously wrong with a system which having conceded the need for strict environmental standards in the UK mining industry, then abandons that industry in favour of one in another country which is totally reliant upon the exploitation of people and the degradation of the environment.

Low-sulphur cartel?

Many observers believe there is a high chance that a combination of the US's new Clean Air Act and the LCPD will force the price of low sulphur coal up: "An increased demand for imported low-sulphur coal and gas will inevitably raise their prices and these solutions could become increasingly uneconomical. It appears likely that the UK could be forced to fit extra FGD equipment whilst, in the mean time, it had devastated the mining industry." Gaining the cheapest fuel source is not the only parameter in the energy equation, according to the Committee "Substantial coal imports resulting in the closing of British pits raise the fear that security of supply will be endangered and Britain [will] be exposed to the risk of an OPEC-style cartel raising prices."

CCGT offers several benefits, the most obvious of which is that it is cheaper than imported coal and FGD; it produces electricity at about 2.3p/kWh. It also produces virtually no SO_2 and only half the carbon dioxide of a similar coal station. Currently there are plans for about 10,000MW of CCGT. Jim Skea of the Science Policy Research Unit believes that this would "deplete about one third of the remaining or probable gas reserves ... in the Southern Basin of the North Sea, making a considerable dent in total UK reserves." Anything over 10GW of CCGT would mean importing gas. National Power argue that there are "plentiful supplies" of gas for importing, and that the price of gas would have to double before it lost out on economic grounds to British coal. However, in their evidence, the NUM show, using DoEn statistics, that the price of gas will indeed double by the end of the century.

Greenpeace note that "Current commitments by the electricity supply industry to retrofit up to 8GW of existing coal plant with FGD and construct up to 10GW of new gas turbine capacity will, given current estimates of energy demand substantially fail to meet the targets specified by the LCPD." They conclude that "In its negotiations over the LCPD the UK Government secured lenient targets based on false premises. If the generators continue to be allowed to meet the Directive through the use of low-sulphur coal, in preference to fitting FGD, then it should become a matter for the European Commission as to whether the UK should now meet the higher targets set for other major European polluters."

Efficiency measures

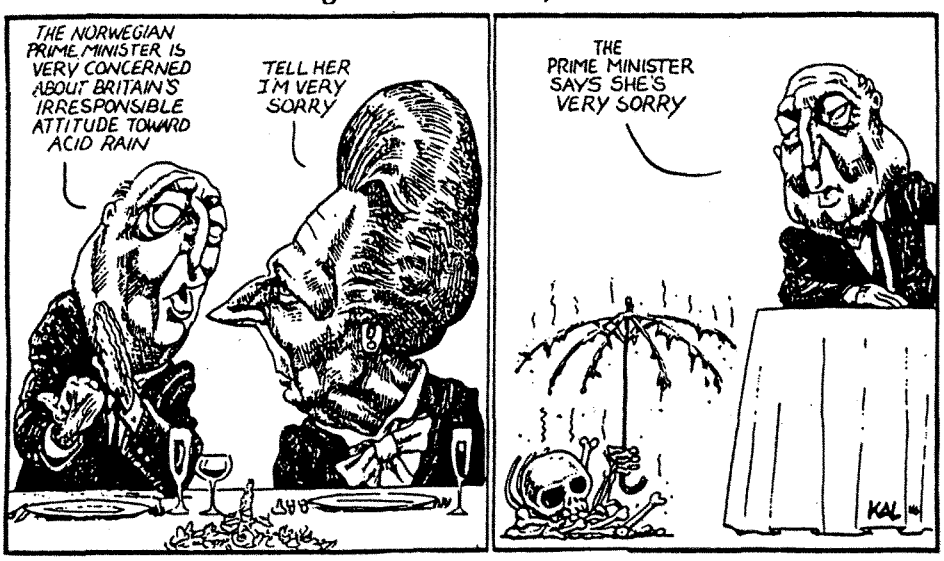
Energy efficiency would obviously be an ideal component in any plan to reduce pollutants from power stations. When asked by Peter Rost MP what role energy efficiency would play in reducing SO_2 emissions Dr Chester, Executive Director for Technology and Environment for National Power, replied "We are doing a lot, we think". He spoke of improvements of a few percent in the operating efficiency of their generating plant, and of their marketing drive: "both energy efficiency consultancies and packages go along with our sales". However, Rost was one of the Tory MPs who attempted to get the principle of 'least cost planning' built into the Privatisation Bill, and was clearly referring to reducing domestic consumer demand, not just industrial demand. The Committee noted: "Both generators claimed to attach importance to promoting efficient use of electricity, but neither mentioned this as part of their strategy for reducing SO_2 emissions."

Given the rather loose plans for complying with the LCPD, neither generator nor Government have given any consideration to the possibility of emissions being further restricted. However, built into the Directive is a review of the emission targets in 1994, when if necessary the limits will be altered - but unlike last time a unanimous vote of approval is not necessary, majority support will do. The scientific consensus is that higher figures are necessary, perhaps as much as 80%, so it seems likely that the UK will be forced to retrofit more FGD. National Power, when asked about this, replied "We have plenty of time to take the necessary remedial action. Of course we would regret any action that forced us into very heavy costs. So far we have taken the limits as they stand." With a 6 year lead time for FGD, is there really "plenty of time"?

The report raises more questions than it answers. This is particularly evident when senior civil servants from the DoEn and Department of Environment are being questioned. Some of their replies are worthy of Sir Humphrey from the BBC's satirical series *Yes Minister*: they appear to have abdicated all responsibility - through the process of privatisation - for issues which go beyond the free market, like the national balance of payments deficit.

We must hope that when international limits are finally set for carbon dioxide emissions history does not repeat itself. □

***The Flue Gas Desulphurisation Programme*, Commons Energy Select Committee 3rd Report. HMSO, June 1990, £11.10.**



From: Acid News

Six years ago the First Standing Conference on Low-Level Radiation and Health concluded that official radiation safety standards put people's health at risk. At that time anyone campaigning for lower limits was dismissed as a crank, but events since then have proved them correct. PETE ROCHE was at the Sixth Conference held in Bangor, North Wales.

Lowering the risks

OVER the last year we have seen the publication of no less than three landmark reports: the fifth report of the US Biological Effects of Ionising Radiation Committee (*BEIR 5*), the draft recommendations of the International Commission on Radiological Protection (ICRP), and, of course, the Gardner report.

BEIR 5 concluded that low-level radiation is three to four times more likely to cause cancer than was previously thought. These higher risk estimates were the result of revised risk models and dose estimates for survivors of the Hiroshima and Nagasaki bombs (*SCRAM 75*).

In contrast the ICRP's draft recommendations failed to propose a reduction in the dose limits for radiation workers or the public, despite recognising that radiation is four or five times more dangerous than was previously thought. To justify not reducing the dose limits they have rewritten their acceptable risk philosophy. Their comparison of the annual risk of death from cancer in the nuclear industry with fatal accidents in other industries no longer produced the required results. So, now they make their comparisons on the basis of numbers of days of life lost. Fatal accidents in non-nuclear industries tend to occur on average at age 40, whereas cancers tend to occur at around age 60. On this basis they judge fatal cancers as less important than fatal accidents. This risk philosophy reduces the pain and suffering experienced by cancer victims and their families to mere estimates of time (*SCRAM 76*).

The Gardner report was outlined by Dr Michael Snee, who worked on Professor Gardner's team. The study was initiated because of a 10 fold increased incidence of leukaemia in children and young adults, over a 30 year period, in the village of Seascale, West Cumbria.

Discharges from Sellafield were not thought to have been sufficient to have caused this increase. Gardner looked at pre-natal X-rays, viral infections, social class, children born to parents over 40, habits which could enhance a child's exposure to Sellafield's radiation, and parents' occupation. He found that children of workers who received doses of 10mSv or more in the 6 months before conception faced a 6-8 fold increase in the risk of developing leukaemia. (*British Medical Journal* 17 Feb 1990).

Fathers living outside Seascale with high radiation histories would also be expected to have a higher risk of having a child who contracts leukaemia says John Urquhart, who worked with James Cutler on the now famous Yorkshire TV programme, *Britain's Nuclear Laundry*. But, this is not the case. Does this mean that the excess leukaemias are caused by an interaction between fathers receiving a high dose before conception and the child subsequently being subjected to high environmental radiation? The Gardner team are now examining this possibility.

Of course, radiation doses caused by the Sellafield discharges may be much higher than we think, because the models of the environmental pathways which carry radiation back to humans are wrong. Dr Bogus Zaba from Bangor University reminded us that the models of caesium movement in soil, post-Chernobyl, were wrong, which casts a shadow of doubt on other environmental models. Any model will have many areas of uncertainty including unreported discharges, actinide resuspension, human behaviour, dietary habits and metabolism.

Downs Syndrome

Patricia Sheehan works for the Association for the Mentally Handicapped, in Ireland, with Downs Syndrome (DS) children. She describes DS as a genetic defect which sticks out because children with the syndrome tend to live longer than children with other genetic defects.

In 1974 a mother came into Sheehan's clinic with a 4 year old DS child. It transpired that 2 or 3 of her old school friends had also given birth to DS babies. The mothers had all been at a small boarding school in Dundalk which had been quarantined with a flu epidemic in October 1957.

After 8 years of study Sheehan discovered 8 of the girls who had been at the school in 1957 had given birth to DS babies. The evidence collected points to a connection between the high incidence of DS births and the October 1957 Windscale fire. Dundalk is around 130 miles due west of Sellafield. Earlier this year, Professor Bobrow, a paediatrician and chair of the Committee on Medical Aspects of Radiation in the Environment (COMARE) announced a UK survey into the incidence of DS, so we may soon find out if there is a raised incidence of DS in other areas affected by the 1957 fire.

Chromosomal effects

Dr Ian Gill, from the Genetics Department at Liverpool University, has been carrying out chromosome studies on sheep from areas of high Chernobyl fallout. He has discovered major chromosomal re-arrangements at a very low frequency in sheep with recorded becquerel counts of up to 3,500Bq. To find out if this is significantly different from that which occurs 'naturally', in animals exposed only to natural background radiation, he would need extremely large samples and an enormous investment of time.

While the results so far are by no means statistically significant, they indicate that the number of chromosome gaps fall as levels of radiation recorded rise. If the radiation has caused damaged chromosomes to repair more quickly, then further studies might help to support the theory that a little radiation is good for you - hormesis. However, it is very difficult to say what other consequences repairing these gaps might have.

"The sums spent on avoiding exposure to radiation make one wonder if one is living in a developed country or topsy-turvy land." (*The Lancet*) quoted Dr David Sumner, Department of Nuclear Medicine at Stobhill General

Hospital in Glasgow, at the beginning of his talk on Medical Exposure.

The National Radiological Protection Board (NRPB) argue that it is worthwhile spending between £3,000 and £15,000 to avoid 1 person Sv[1] of exposure. Sellafield's new actinide removal plant will cost £3m per person Sv avoided. A far more cost-effective method of reducing the collective dose would be to reduce people's exposure to medical radiation.

Doses from Radiology and Nuclear Medicine vary enormously. The average dose from a chest X-ray is 0.05mSv, but it may vary by a factor of 500 between hospitals. Some nuclear medicine procedures can give a dose of 20mSv. Among the UK population the collective dose is 16,000 person Sv, which is enough to cause 640, mainly fatal, cancers.

Improved techniques could reduce medical exposure, but the use of certain types of equipment can also help. For example, in Italy all X-ray machines are fitted with 'rare earth screens', but by no means the majority of machines in this country have them. They can cut doses at a maximum cost of £40 per person Sv. Carbon fibre couches or table tops can cut the average dose by 50%, because they absorb less X-rays, so a lower dose can be used. A third method of reducing doses is to cut out unnecessary X-rays.

Dr Bill East, Head of Health Physics and Nuclear Medicine at the Scottish Universities Research and Reactor Centre (SURRC), detailed their work on the high incidence of leukaemia and Central Nervous System tumours around the Capper Pass Smelting Plant on the Humber Estuary.

Radioactive ores

In 1984 it came to light that Polonium-210 was being emitted from the smelter into the environment via a 600ft chimney. SURRC were asked by the East Yorkshire Health Authority to review and evaluate existing information and make recommendations. Although the study team say the excess of cancers cannot be attributed to any operation at the plant, they concluded that the Radioactive Substances Act 1960 is "in urgent need of fresh review and revision".

The 1960 regulations only cover ores if any individual radionuclide is present in the raw material with a specific activity of greater than 15Bq/g (or if the total activity present exceeds 100Bq/g). However, ores with an activity of only 0.3Bq/g of thorium or 1Bq/g of uranium can expose workers to doses which are ten times the present limit for the public (0.5mSv/yr) (*SCRAM 76*).

The international incidence of myeloid leukaemia and radon concentration in homes in 14 countries has been studied by Dr Denis Henshaw from Bristol University. He has found a strong correlation. The correlations are particularly compelling in Canada where the regions covered by radon surveys and cancer registries properly coincide. However the Cornish figures are anomalous. The West Country has high levels of radon. Somerset has the highest incidence in the UK of all sorts of cancers, yet Cornwall has a normal level of cancers. Henshaw points out that the NRPB took only 14 measurements of radon in Cornwall, and their survey was not population weighted (*Lancet* 28 April 1990).

Jack Dromey, the National Secretary of the Transport and General Workers Union (TGWU) is responsible for all TGWU members who work for British Nuclear Fuels, the UK Atomic Energy Authority, the Ministry of Defence and the Royal Dockyards. He said that trades unionists now want to unite with Friends of the Earth (FoE) to campaign for lower radiation doses, whilst agreeing to differ on future energy policy.

Gardner effect

The Gardner report has caused a sea change in workers' attitudes, which would have been inconceivable 10 years ago. It is one thing to affect your own health by working with radiation, but it is quite different to affect your children's health. Representatives from all the nuclear sites and all the industrial unions met 6 weeks after the Gardner Report was published. They welcomed further studies, but said they should be speeded up. In the meantime they called for a 10mSv per year limit and a 5mSv limit in any 6 month period. The unions realise this will be a problem for the industry, but want the benefit of the doubt to be given to safety. They do not want danger money, they just want the elimination of danger.

Dromey held up the refurbishment of building B205 at Sellafield as an example of what can be done. The building now has computer controls so that workers can go into active areas with exactly the right tools, at exactly the time the previous worker comes out. This kind of technology is expensive. The unions are also arguing for the extension of the compensation scheme to the children of nuclear workers.

The conference was rounded of with a call from Patrick Green, FoE's radiation campaigner, for a concerted campaign

to stop the new ICRP recommendations being incorporated into UK legislation. Besides the trades unions, the 170 nuclear free local authorities have already joined the campaign, but more local campaigns are needed.

Any new legislation will be in place for at least 10 years, so it is important we get it right now. FoE want emergency legislation brought before Parliament to enforce a 10mSv per year dose limit, with strict collective dose limits set to ensure that reductions in individual risk do not cause collective risk to increase. In 5 years time the 10mSv limit should be further reduced to 5mSv. FoE also want the site specific public dose to be reduced immediately to 0.2mSv.

From being dismissed as a bunch of cranks, the Standing Conference has gone from strength to strength. The high calibre of this year's speakers, and workshop conveners gave campaigners a chance to meet scientists and professionals working in the field. Next year's conference will be in Bristol. Campaigners will be working to make sure that, by then, there will be some good news about reductions in dose limits[2]. □

Notes

1. The person sievert is the non-sexist unit of collective dose equivalent. It is more usually called a man sievert. The term is used when the radiation exposure of a population is being considered. It is the average dose equivalent (in sieverts) multiplied by the number of people exposed.

2. A meeting has been arranged in Newcastle in September for radiation and health campaigners to discuss future directions and information exchange. Contact SCRAM for details.

Labour's Energy Agencies

RENEWABLE energy and energy efficiency will be promoted by their own agencies under the next Labour Government, Frank Dobson, the Party's spokesperson on energy, told the Combined Heat and Power Association at their Annual Lunch on 14 June.

The Agencies will be the central planks of the Party's energy policy: "To waste energy depletes fuel reserves, damages the environment and costs money. Yet energy efficiency has never been a priority. It can't go on."

The Energy Efficiency Agency will not only be responsible for the efficient distribution and use of energy, it will cover "major policy aspects including the comparative efficiency, cost and environmental aspects of alternative sources".

"The history of the renewable energy programme over the past two decade has been a disgrace", observes Dobson. A Renewable Energy Development Agency would take the control of renewables away from the Atomic Energy Authority and be "responsible for the development of a British renewables industry".

He expressed his disgust over the way in which "some in the scientific community have gone along with the lying about the costs of nuclear power and who have practised a policy of disparagement and deception towards alternative sources of energy".

In particular: "The saga of Salter's 'Duck' is a national disgrace." It was, he continues "nobbled by its nuclear rivals. If Salter's 'Duck' had been a horse, there would have been a stewards' inquiry and most of those involved would have been 'warned off'. Needless to say, as it wasn't a horse, Ministers tell me that no disciplinary action will be taken."

Both agencies would report annually to Parliament. Recognising the vast export potential of environmentally sound energy practices Dobson promoted the Party's energy policy as "intended to assist British companies [to] develop and sell energy efficient equipment both in this country and around the world.

"We will make energy saving our top priority instead of the current headlong pursuit of energy sales." □

US renewables

RENEWABLE energy now accounts for 13% of the electricity production in the United States, and over 10% of the domestic energy supply, according to a new report form Public Citizen *.

Nationwide, say Public Citizen, renewable energy provides 23% more energy than nuclear power, "and exceeds nuclear's contribution in 34 states and the District of Columbia". This means an annual reduction in carbon dioxide emissions of more than 550 million tonnes, "equal to the annual output of 138 typical coal-fired power plants".

John Claybrook, President of Public Citizen, warns: "Despite the growing threats of global warming, radioactive waste, and rising oil imports, the Reagan and Bush administrations as well as the US Congress have dropped the ball in developing renewable energy as one effective solution to these problems." During the Reagan years the budget for renewables research and development was cut by 90%. Claybrook continues: "It is in the states economic and environmental interests to take the initiative, as some have done, to promote the rapid development of biomass, wind, solar, geothermal, and hydroelectric energy resources."

Biomass accounts for the largest chunk of the renewable contribution, 50%, with hydro-electric producing 45%, and solar, wind and geothermal producing the rest.

"The issue of global warming perhaps best illustrates the necessity of accelerating the development of renewable energy" argues the report. However, while energy efficiency can meet the current international agreement to cut emissions by 20% by 2005, the necessary cut back of 50-80% "can only be achieved by replacing fossil fuels with non-CO_2 emitting energy sources". The excessive cost and long construction time of nuclear power, and the still unresolved questions of nuclear waste and decommissioning, precludes nuclear power as "a realistic option for accomplishing this task".

Renewables, despite being the poor relation to nuclear in terms of Government funding, are progressing fast. Over the last decade the cost of electricity from "solar and wind technologies has fallen by 60-75%, and further cost declines are expected". Also, renewable energy industries have the ability to at least double the amount of energy they now provide by the year 2000 and nearly quadruple by 2010. □

* ***The Power of the States: A Fifty-State Survey of Renewable Energy*; 100pp, $20. Available from Public Citizen Critical Mass Energy Project, 215 Pennsylvania Ave SE, Washington, DC 20003.**

CHP and gas

CITY centre combined heat and power (CHP) schemes may become a common feature in the UK if Citigen, a new venture by British Gas (BG) and a French company, Utilicom, is successful.

The first such scheme, a 15-20MW (electricity) CHP plant in the City of London, is expected to be announced shortly. BG will provide the fuel and Utilicom will build and operate the plant. As the City is undergoing large scale development work it is felt construction of the plant and laying of the associated pipe work will go virtually unnoticed.

When launching Citigen, BG emphasised the "greenness" of natural gas and pointed out that it is "virtually free from sulphur and other pollutants that contribute to acid rain. The combustion of any fossil fuel generates carbon dioxide ... but burning gas produces far less carbon dioxide than coal or oil." The potential of CHP is enormous: "With conventional power generation, the UK loses to the environment enough heat to supply every home, office and factory in the Country. The increased use of CHP will reduce significantly this heat loss." They said that Citigen will "undertake all forms of contract energy management and aims to take a lead in designing, constructing and operating city-wide CHP schemes".

Although the company hopes to extend its operations overseas, initially it will concentrate on UK cities where the local authorities have expressed an interest in CHP. Typical schemes will cost £20-50 million and produce about 100MW (electricity).

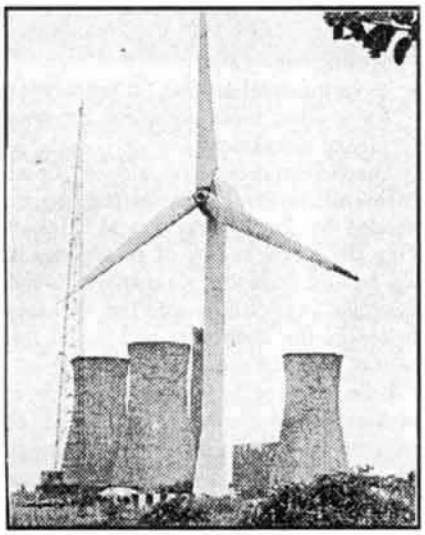
In the past gas has been the 'noble fuel' - too precious to burn in power stations. However, times are changing, major new finds of gas reserves and enormous advances in burning technology combined with its potential for combating air pollution have made it the fuel of the nineties.

When Walter Marshall was the chief scientist at the Department of Energy he chaired a committee which examined CHP. It concluded that CHP was not only uneconomic, but the disruption caused by laying pipes to carry hot water would not be tolerated. It has taken the industry many years to throw-off that judgement. New techniques for laying the pipes - 'trenchless pipe laying' - pioneered by BG means disruption involved is cut to a minimum.

Given that it is the interest shown by local authorities that has kept CHP alive since Marshall's 1979 report, and that Citigen intend to target local authorities and provide private capital, we may well see CHP taking its rightful place in the power industry.

■ Newcastle City Council have granted outline planning permission for a 300MW (electricity) CHP scheme. It is hoped that Tyne and Weir Development Corporation will follow suit, allowing work to start soon.

The station will be gas fired and offer considerable environmental advantages over conventional plant - it will have virtually no emissions of sulphur dioxide, ash and dust; a 60% reduction in carbon dioxide emissions; and a 33% cut in nitrous oxides. It also has a higher energy conversion factor to electricity, of about 46%, compared with an equivalent coal fired station, 36%. □



PowerGen turbine trial

INVESTIGATIONS to find the appropriate size of wind turbine for mainland electricity production in the UK progressed in July with the opening of the 1MW machine in Richborough in Kent.

Costing £3 million - met jointly by the Department of Energy, the CEGB, the European Commission and James Howden - it will provide enough power for about 600 homes. The 130ft high machine with three 80ft blades will now be owned and monitored by PowerGen.

Energy Minister, Peter Morrison, opening the turbine said: "Renewable energy projects will be given assistance to enter the market so that in time they will become fully competitive.

"We expect to reserve 600MW or more of declared net capacity exclusively for renewables during the 1990s. Within this, the department hope to set a tranche next year specifically reserved for wind power.

"There are two main reasons why renewables have an enhanced importance within the power industry. First, they help increase diversity and therefore security of supply, and second, they provide energy without contributing to the greenhouse effect."

However, PowerGen were less optimistic arguing that while it is examining renewable energies, its primary goal is to be the lowest-cost electricity producer in the UK: "at the end of the day we will have to be satisfied that they are commercially viable." □

Wind site storm

PLANS by the North West Electricity Board (NORWEB) to build a 4.5MW wind farm just outside the Lake District National Park have sparked a fierce row, highlighting the problem of wind power's only source of pollution - visual intrusion.

NORWEB wants to erect 15 wind turbines, each over 130ft high, on Kirby Moor in the Furness area of Cumbria. The site, according to the board, is one of the finest in the country for wind power. However, while recognising the value of wind as a non-polluting energy source, local environmentalists are concerned that the farm will be visible for miles.

South Lakeland District Council have examined NORWEB's plans and recommended that a formal planning application should be submitted, backed by a "landscape-impact assessment". Philip Morris, the council's chief planning officer, in a report to the development subcommittee, argues that there is scope for the development. Added to this, NORWEB have already persuaded the Non Fossil Fuel Purchasing Agency that the scheme is viable on the basis of 15 machines.

The Nature Conservancy Council, who are currently considering the Kirby area for designation as a Site of Special Scientific Interest because of its heather moorland, which is in decline across Europe, have expressed their concern and are approaching NORWEB for more details of the project. Kirby is also of considerable ornithological interest.

Mike Houston, the secretary of Friends of the Lake District, claimed: "The proposed turbines would be in countryside crossed by footpaths, and access would inevitably suffer. They would be silvery-white and this could ruin the views for miles around within the park."

John Toothill, Lake District National Park Officer, commented: "In general, we are in favour of new technology for producing electricity, but it all depends where the site is.

"No doubt South Lakeland District Council will take into account the fact that there is a national park to the north side of the proposed turbine site." □

Swedish offshore wind

A 220kW wind turbine has been placed 250km, in 6m of water, off the coast of Nogersund, southern Sweden, in an attempt to test the viability of offshore wind power.

If the turbine proves to be successful then the backers - construction firm BPA, Sydkraft, the Swedish Energy Administration and Swedish Energy Development-AB - hope to site up to 98 3MW machines in water about 20m deep.

Project chief, Karin Jarl, argues that it is "not meant to produce kilowatts but to produce knowledge". The main factors under review will be its effect on fishing, navigation and public acceptance, also wave effects and maintenance costs will be closely monitored.

Although Jarl refuses to discuss the cost of electricity from the turbine, previous studies show that it will be about double that of conventional plant. However, with electricity prices expected to increase by 30% over the next 10-15 years, offshore wind may indeed have a future. □

Irish windfarm

THE first small step towards exploiting the huge potential for wind power in Ireland, one of the best in Europe, was taken when the Irish Energy Minister announced that within the next 3 years a 6MW windfarm would be built.

A specially created affiliate to the Wind Energy Group, Irish Wind Energy (IWE), would build the windfarm in the west of the country, and its power will be bought by the state utility, Electricity Supply Board (ESB). IWE is backed by Taylor Woodrow and British Aerospace, who control 45% of the the company, the remaining 55% is owned by s mystery company which has so far been identified only as "Irish industry".

IWE have also announced their intention to build a further three wind farms. The cost of all four projects will be around (UK)£25 million. It is hoped that the European Community's Valorean Programme will provide about £3.5 million.

Observers are interpreting the Minister, Bobby Molloy's, public announcement, at a conference on Global Warming, as a warning to ESB that the Government are seriously considering wind power for a significant role in the Irish Energy equation. ESB, however, may not be so willing. In its latest policy document "Connecting with the Future - Electricity Supply Board Strategies for the 1990s" it argues "In the present state of [renewable energy] technologies they are unlikely to have any significant part to play in the medium term." It continues: "Even though the amount of electricity which would be available from the renewable sources of small hydro and wind is insignificant, ESB will nevertheless give favourable consideration to the purchase of electricity from such sources because of the contribution they would make to environmental protection."

Irish wind power enthusiasts are pinning their hopes on another paragraph from ESB's policy document: "The development of clean coal technologies is well advanced, but these are unlikely to be commercially available until the end of the decade. It is generally in the interest of ESB to buy time instead of constructing additional coal plant in the short-term using existing technologies." Currently Ireland relies upon its own supplies of natural gas for 34% of its primary energy, however, their reserves will be all but depleted by 1993. ESB hope to construct a gas pipe line to the UK, in an attempt to meet the shortfall. If this fails to happen then wind power will be the obvious choice to bridge the gap. □

Mersey Bill

AN extra £1.5 million has been made available by the Government for investigations into a tidal power barrage across the Mersey. The Mersey Barrage Consortium will meet the rest of the £3 million necessary to complete the third phase of feasibility studies.

The new money represents a Government U-turn, they have always insisted that the barrage should make it on its own with money entirely from the private sector. It is believed that the Government's new moves were prompted by the positive effect the barrage would have on land values by the river, as it would reduce periodic flooding. "Renewable energy has enhanced prospects under the electricity privatisation proposals, and of course will help in reducing the threat from the greenhouse effect", claimed Energy Minister, Tony Baldry. Yet the barrage will not be eligible for inclusion in the Non-Fossil Fuel Obligation (NFFO) because it will not produce any power until 1999 at the earliest. The NFFO ends in 1998.

The studies will include:

- a site investigation to establish the foundation conditions for the barrage;
- further civil, mechanical and electrical engineering studies to refine the design of the barrage with a view to reducing costs and increase performance;
- modelling the effects of the barrage on ship movements;
- further study of its likely effects on water movement and the pattern of sedimentation and;
- environmental studies, in preparation for a later, more complete, environmental assessment.

The Government have also set up an inter-ministerial committee, to be headed by Peter Morrison MP, involving the Departments of Employment, Trade and Industry, Transport, Social Security, Agriculture and the Treasury to assess the economic and social impact of the Barrage.

If the results of the feasibility study prove favourable then a further £12 million will be required to get a Parliamentary Bill ready for late next year. It is hoped that construction work on the barrage, which could produce 75% of Liverpool's electricity demand, will begin in 1995. □

Tory 'green' group back windpower

A paper published by the Tory Green Initiative calls on the Government to revise their energy policies in order to boost the role of wind power in the energy market.

Chaired by the Agriculture Minister, John Gummer, the Initiative argues that wind is probably the cleanest source of power available in the UK, and that its deployment is being hindered by planning policies and the Government's refusal to guarantee a fair price for wind generated electricity to be sold to the national grid.

The paper's author, Rupert Blum, a former energy specialist with the European Commission, points out that despite the Government's claimed support for wind technology it has so far only built experimental machines.

Blum suggests that the Government also gives banks capital guarantees so that the funds for building wind farms can be raised, and that they instruct district councils to relax planning controls to ease the introduction of wind farms.

Blum concludes: "Wind farms represent an excellent means for private individuals to make a contribution to pollution free electricity generation in Britain. Unlike shareholders in large public companies, investors in wind farms will tend to be local people with strong direct interests in the success of the venture." □

Tyre power scheme for Wolverhampton?

AN American company has unveiled plans to build a 20MW power station fuelled by waste tyres. The company, Elm Energy and Recycling of Connecticut, have applied for a generator's licence and intend to build the plant on a 6 acre industrial estate in Wolverhampton.

The station would burn 90,000 tonnes of waste tyres a year - about half of the 25 million scrap tyres produced in the UK each year, generating enough electricity for about 20,000 homes. The Wolverhampton site has been chosen because it is only a day's lorry drive from half the waste tyre dumps in Britain.

Because of the environmental implications, Midlands Electricity has recommended to the Department of Energy that tyre power should be considered under the Non-Fossil Fuel Obligation, and has already stated its commitment to buy the plant's output.

The plant would be the first of its type in the UK, but, Elm stress that this is a proven technology with one large station already in operation in the US and one being built. Another three plants are planned for mainland Europe.

It is designed to appeal to environmentalists; not only does it deal with the otherwise hazardous waste tyres but has very high emissions standards. It operates at high temperature, thus eliminating the evolution of dioxins. The effluent gases are passed through a serious of filters and as flue gas desulphurisation unit removes sulphur dioxides.

Anne Evans, the company's President, describes the final emission as "little more than reheated air. This will be the cleanest power station in the UK." Its emission control standards are higher than those currently in force in the UK and would anticipate those being introduced next century.

Elm hope to begin construction early next year, and power production in 1992. □

SHE exhibition

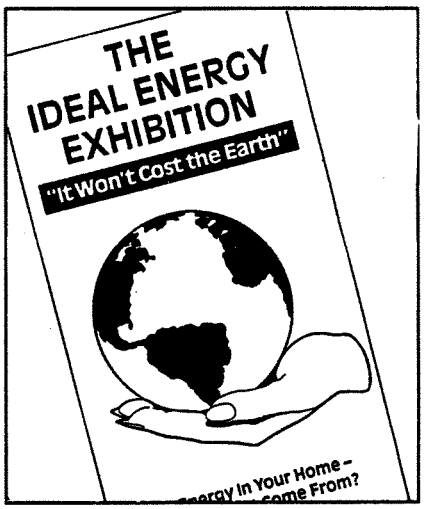
NOW touring, The Ideal Energy Exhibition, housed in a specially converted caravan/trailer, is designed to "spread the message" that energy conservation means both less pollution in the environment and lower household fuel bills. It is being promoted by Stop Hinkley Expansion and has been designed by the Bristol Energy Centre.

Focusing on the Jenkin family it shows how they evolve from energy wasters to energy conservers. By means of a series of "hands on" displays visitors can examine how simple measures, like buying a more efficient fridge, can significantly cut the Jenkin's "pollution bill" and their fuel bill.

At the heart of the exhibition lies a scale model of the Jenkin's "badly insulated home", complete with a "real draught".

The 26ft wide and 7ft long caravan can be towed to any part of the UK. For visits outside the Avon and Somerset area, a contribution towards running costs will need to be made by the "host group". □

■ For further information see the leaflet enclosed in this SCRAM and contact Claire Dorling, Exhibition Administrator, Tel: 0454 418596.



Greenhouse con

GOVERNMENT forecasts of how much carbon dioxide (CO_2) will be emitted by the UK in 2005 have come in for heavy criticism for being deliberately high.

Mrs Thatcher claimed that unless the Government intervened there would be a 30% increase in the emissions of CO_2 by 2005, and promised that, "provided others are ready to take their full share" in controlling pollution, the UK would stabilise its emission at 1990 levels by 2005.

However, documents leaked to the Labour Party suggest that the Government have deliberately inflated the forecast. Bryan Gould, shadow Secretary of State for Environment, said "the projections she is referring to are not worth the paper they are written on. They have been deliberately inflated to make her position look radical ... no one else believes this far-fetched forecast."

Drawn up by the Department of Energy (DoEn), the forecasts are for the International Panel on Climate Change who will be delivering their report to world leaders later this year.

According to minutes marked "strictly confidential" a senior DoEn civil servant said the forecasts "had been put together in a very short period of time" He claimed that the computer models on which they are based "were in need of overhaul" and "extreme free market ethos applied to energy policy had prevented officials from considering what a more balanced approach might look like".

After Mrs Thatcher's announcement the Confederation of British Industry (CBI) publicly announced their agreement with the forecasts. However, a CBI internal report expressed some concern: "The projections of CO_2 appear excessively high."

Indeed a report from the internationally respected University of Sussex Science Policy Unit concludes that Britain's "business as usual" CO_2 emissions will rise by 10% by 2005, and 17% by 2020.

Jim Skea, author of the report for the US Government's Environmental Protection Agency, largely agrees with the DoEn's methodology but believes their prediction that industrial use of energy will rise steeply is wrong.

Chris Patten, the Environment Secretary, responded by saying: "They [the forecasts] have been the subject of perfectly understandable critical argument but the methodology, we believe, is robust." □

Euro Ministers

FOLLOWING an informal meeting of European Community environment and energy ministers it has been decided to hold a formal Council meeting in October to formulate a strategy for tackling the pressing issues of energy and the environment. Such double-barrelled meetings are rare but becoming more frequent as the widening net of Community policy forces member states to work together.

The impetus for the meeting comes from the Communities new Italian Presidency. The Italian's say that they want a greener Europe "with stricter rules for environmental issues".

Rome wants closer co-ordination among member states in order to co-operate with the US and Japan to reduce carbon dioxide (CO_2) emissions. It has taken the opportunity of its presidency to circulate a new strategy entitled ***Proposal for a new European Energy Policy***.

Rather than promote Community energy goals in themselves, Rome believes that the goals should act as an "intermediary step leading to international co-operation in energy supply and consumption". Among their proposals for a future energy policy are: conservation and rationalisation; transition from fossil fuel consumption to other sources, including renewables and; and new mechanisms to regulate energy prices, including some form of energy taxation.

The energy tax and incentives for conservation must focus on the individual user as much as industry, argues the proposal. Nuclear power also has its part to play, however not before there is sufficient research demonstrating "its maximum safety" to those states which have rejected the nuclear path (which includes Italy itself).

They also suggest the establishment of three technical working groups on EC energy policy. One would link the EC states with other OECD nations to examine energy-related tax measures and ways of spending funds generated. Another to decide on the best methods of reducing CO_2 emissions in individual states, while the third would concentrate on energy conservation techniques. □

Sweden: fuel cell

SWEDEN is to begin testing the potential offered by fuel cells in providing combined heat and power by buying and operating three experimental cells, costing about £2 million.

Sydkraft, southern Sweden's electricity utility, will buy 2 cells. The largest, providing 200kW of electricity and 200kW of heat, will come from International Fuel cells in the US, and will begin operation early in 1992. The other cell, to be delivered in 1992, will come from Fuji Electric in Japan, and will produce 50MW of heat and electricity.

Sydkraft believe that fuel cells are the power source of the future because they have very low emissions and can be placed on almost any site.

Vatenfall also plan to test a fuel cell. They are purchasing a cell solely for producing heat to be used in district heating, rated at 50kW, from Japan. They also believe that fuel cells have an enormous potential and plan to develop cells for broader commercial use in about 10 years. □

Denmark: wind

PLANS to force Danish power companies to install 100MW of wind capacity by the end of 1990 will not be met because Denmark's 2 power companies - Elsam and Elkraft - have been unable to get local authority approval for sites in time.

Elkraft, which serves eastern Denmark, say they will be about 15MW short of the 45MW proposed under the 1985 plan, which was initiated the following year. Elsam expect to be between 5MW and 8MW short of the 55MW target set for them.

However, the energy minister is considering plans for installing a further 100MW of wind power, again over 4 years. The power boards have warned against such a move, unless the ministry and local authorities can cooperate to produce a national plan governing the siting of wind parks. It is hoped that such a plan would overcome both public opposition and time consuming bureaucracy. □

Switzerland: solar

THE fledgeling Swiss solar energy industry are launching the "Solar 91" challenge on the back of the 700th anniversary of the nation's independence. It is offering the nation the chance to fight a new battle for independence - energy independence. 80% of their primary fuel is imported.

The challenge is to create 700 new solar installations by 1991, and at least one in each of Switzerland's 3,029 communes by the year 2000. Solar 91's organisers say that the typical Swiss household needs 4,800kW a year which could be provided by 25-45m^2 of solar cells, and that 1,000m^2 of "constructed/equipped/inhabitable surface per Swiss citizen is available for placing the cells".

Swiss apartment blocks and industrial buildings already boast some 100,000m2 of cells, and for Solar 91 the anti-nuclear city of Geneva is launching a £900,000 programme to equip all municipal apartment blocks with solar panels. □

REVIEWS

How Safe is Safe? Radiation Controversies Explained by Dr Barrie Lambert. Unwin; 1990, 284pp, £7.99.

Radiation-induced Cancer from Low-Dose Exposure: An Independent Analysis by John Gofman. Committee for Nuclear Responsibility; 1990, 480pp, $29.95.

Publishing a book about radiation in a year like 1990 when so much is happening must be a headache for publishers and authors alike. Lambert has managed to include an addendum on the BEIR 5 report, but unfortunately the book has lost a lot by being published before the ICRP's draft recommendations and more importantly before Gardner.

Radiation is a difficult subject to write about well. I'm afraid I found the first three chapters, which attempt to explain the basics, very difficult to get through, and not very accessible. By the time Lambert gets on to Leukaemia 'Clusters' in Chapter 5, the book is much more readable. The chapter on natural background radiation would have benefited from a discussion of the controversy about funding for remedial action on houses with high radon levels. It's also a pity that the book was written too early to discuss Henshaw's work on radon and leukaemia, published in *the Lancet* in April this year.

Unlike most books on radiation controversies, Lambert's devotes a chapter to the risks from the transport of radioactive materials. Although he doesn't go into the kind of accident scenarios suggested by John Large or Charles Wakstein, this chapter contains some useful information which is difficult to track down elsewhere. It might be worth some campaigners buying the book for this reason alone.

One controversy which isn't covered is the radioactive emissions from non-nuclear establishments, such as the Capper Pass Smelter on Humberside or coal-fired power stations, which I think is important to get into perspective.

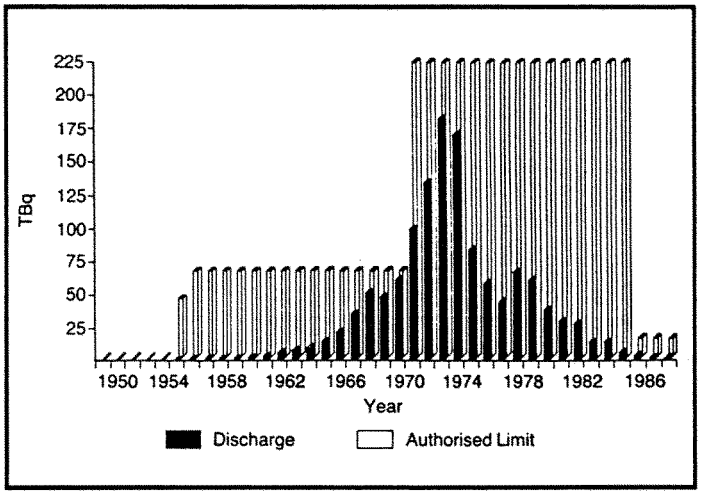
I don't agree with Lambert's conclusion that "both sides in the arguments have lost credibility". The ICRP's reputation must now be at rock bottom. No amount of exaggeration on the part of the anti-nuclear movement could possibly come close to the scale of credibility lost by the nuclear industry. BNFL, for example, have contaminated the whole of the Irish Sea and beyond - "the contamination was not expected to be the problem it is". The worst the anti-nuclear movement could achieve would be to publish a few exaggerations, which might misinform a few people, hardly the crime against humanity BNFL are guilty of.

On balance, if I had a limited budget, I would wait for the third edition of David Sumner's ***Radiation Risks: An Evaluation***, which should be out in the Autumn.

The second book is not for beginners. Gofman is perhaps most famous for a paper he published with Dr Arthur Tamplin in 1970, which concluded that human exposure to ionising radiation was much more serious than previously recognised. Because of this the authors spoke out against using nuclear weapons to liberate natural gas in the Rocky Mountains or to excavate canals and harbours, and against US plans to build 1,000 nuclear power plants as quickly as possible. Much of the book is devoted to criticising the 'retroactive' altering of the Japanese A-bomb data. "It is hard to imagine a more questionable practice in epidemiological research than this" says Gofman. He makes some strong criticisms of BEIR 5 as a result. Gofman arrives at risk-estimates for acute-low and slow-low exposures which are up to 30 times higher than the wide range of values provided by UNSCEAR and BEIR.

The BEIR report says that exposure to low level radiation is three to four times more likely to cause cancer than was previously thought. These higher risk estimates are based on the revised risk models and revised dose estimates for survivors of the Japanese A-bombs. The priority, at present, is to make sure the ICRP use these new risk estimates to revise their dose limits. Unless you are an epidemiological researcher reading this huge tome will only be a distraction from this essential campaign.

PETE ROCHE



Total Alpha discharges from Sellafield, 1950-88.

Fuel Poverty - Briefing. Neighbourhood Energy Action; 1990, 8pp, £3.00.

Fuel poverty is not, as many people imagine, a rare thing, nor is it the sole preserve of developing countries. In the UK it is endemic.

More than 5 million pensioners live in homes "colder than the minimum requirement under the Offices, Shops and Railway Premises Act". Low-income pensioners spend 13.5% of their budget on fuel while the average household spends only 5.9%. This is not a revelation, these statistics have been available for many years. That they have been available for years is the tragedy: nothing has yet been done to tackle the problems of the fuel poor. While the work of organisations like Neighbourhood Energy Action should be applauded, they would be among the first to admit that it is 'only tinkering with the problem'.

The briefing points out that "more than £4 billion is needed for work to remedy heating, insulation and condensation problems in the public sector alone". Ironically, £4 billion is how much has been expended on fast breeder reactor research and development, yet we are now told - not surprisingly - that fast breeders will be of no use until some time in the 22nd century.

One wonders why, when people have been living with the misery of fuel poverty, that it has taken issues of the global environment to get politicians and newspapers discussing energy efficiency seriously. Yet there is a possibility that fuel prices will increase, levied for environmental reasons, when a large percentage of the British population cannot afford to heat their homes at the current prices. Indeed many of these houses couldn't be heated no matter how much money was spent on fuel.

In tackling fuel poverty and relieving a lot of pain and misery we can also help to alleviate some of the globally pervasive environmental problems.

There are two reasons for getting this briefing: energy campaigners must be reminded of the social costs of the UK's short sighted obsession with nuclear power; and, every £3 in NEA's bank account helps to fund a real campaign with direct and measurable benefits.

MIKE TOWNSLEY

REVIEWS

The Energy Alternative by Walt Patterson. Boxtree; 1990, 186pp, £16.95.

The Energy Alternative. Channel 4; 1990, 15th, 22nd, 29th July 1990. Grampain Television and InCA.

Wasted energy means needless pollution. It also means deprivation.

People in developing countries, in rural areas, still rely on wood for their energy needs, gathering that wood is a slow and back-breaking process. And, it is getting more difficult, as population exerts an ever increasing pressure on the limited supply. Many using that wood are burning it in three stone fires, a cooking method which goes back thousands of years. Yet, simple cheap clay stoves can improve their quality of life and ease the burden on dwindling wood supplies - this is an end-use approach to the problems of the energy crisis. It highlights the problems faced in all world's - first, second, third ...

In the last of the Channel 4 series we saw absurd pictures of rural electrification programmes in India. The plan is to bring electricity - at an enormous cost - to every village in India. Yet when the electricity gets there, the villagers have no electrical appliances and continue to use their three stone fires for cooking. Nor, have they any money to buy electrical appliances. This is not to say that electrical power is a bad thing, but it is not a panacea. Nor, is electrification the first stage in solving the energy crisis.

The energy world is dominated by those whose aim is to supply power, with callous disregard for those using it. People do not want power, they want the services it can provide.

Drawing on the work of the End-use Oriented Global Energy Project - whose book ***Energy for a Sustainable World*** is the most important energy volume published during the last decade (SCRAM 68) - Patterson shows how it is possible to tackle both environmental and social issues by first examining the way in which energy is used. This is a challenge worthy of the 'technofixers', whose work could be put to good use rather than the current esoteric obsession with the complex jigsaw puzzle of nuclear power.

Like his previous books it is well written and researched, and not to be missed.

MIKE TOWNSLEY

Production team: Walt Patterson, Consultant; Ted Brocklebank, Producer; and William Woollard Presenter.

... Letters ... Letters ...

Dear SCRAM

When a group of mainly ex- or non-cyclists set off from the gates of Sellafield Nuclear Establishment on the first Scotland Against Nuclear Dumping (SAND) 'Other Nuclear Fuel Cycle', Dounreay seemed further away than even our political masters at Westminster believe it to be. But the ten days and six hundred miles that had its fair share of sore bums and frayed nerves, tight schedules and slack navigation, nevertheless proved that it wasn't really that difficult to bring the whole issue of nuclear dumping as close to home as it actually is.

After all, the majority of people have the natural good sense to realise that it's not a good idea to bury dangerous waste in holes where it cannot be properly monitored or readily recovered when the inevitable problems arise; nor is it a good idea to transport this stuff around the countryside with all its implications for the risk of environmental disasters and the erosion of civil liberties; nor is it something for us to be proud of, that our so-called democratic processes are being blatantly abused when it comes to the proposals for the siting of nuclear waste dumps. Even the most ardent supporters of nuclear power we encountered could not argue against the principle of storing waste at its point of production rather than adopting the myopic 'out of sight, out of mind' principle. People are waking up to the fact that the cheapest (financial and political) option for dealing with the waste products of the nuclear fuel cycle is just not good enough, and the widespread support that we received on our little cycle ride was testimony to this awakening of the general populace. The Other Nuclear Fuel Cycle linked people between Cumbria and Caithness into the dumping issue, but also helped to make the necessary connections in people's minds that will make them think more deeply than the bore holes proposed by the witless savants at NIREX. So those involved in the inaugural ride are well pleased with its achievements thus far - but just watch out for the Bigger Better SAND Bike Ride next year, if any dumping proposals still stand.

Yours sincerely

Phil Beadle

LITTLE BLACK RABBIT

Despite their authoritarian image (*SCRAM 73* et al) the people at National Power have shown that they are a nice lot really. They have hired a van, provided the fuel, and dispatched one of their senior engineers on a 3,500 mile round trip to give away a huge array of protective clothing and helmets, now obsolete because of their CEGB markings. And who are the deserving beneficiaries of this act of generosity? They are a group with a similar image problem to National Power - the miners of Romania!

The long search to find a Chair for National Power is finally over. Sir Trevor Holdsworth is the lucky man. A recent President of the CBI, he is Deputy Chair of the Prudential Corporation, and Chair of both BSB and Allied Colloids. Sir Trevor will be keeping these jobs, as, after an initial flurry, he plans to work two days a week at National Power. Lord Marshall was a full-time Chair of the CEGB with an annual salary of around £110,000, so for his 2 day week Sir Trevor will be paid accordingly - £185,000 a year!

Little Black Rabbit calculates that, on rates of pay, Sir Trevor is worth 195 SCRAM staff. This valuation of the new NatPower Chair's worth was underlined at a press conference where he declared that he had no views on how the electricity industry should develop.

Plans by an American hotelier to site a large new wind powered hotel in the UK were recently abandoned because of problems with planning authorities. The Minister, pre-reshuffle, charged with promoting alternative energy, Peter Morrison, was informed of this set-back for UK renewables by a Danish energy attaché, who expected immediate remedial action would be taken. Instead the response was "what do you expect from local planners?" This commitment to renewables was hardly surprising from Morrison who, as Minister for energy efficiency, didn't even have loft insulation in either of his own houses. Morrison now works directly under Mrs Thatcher as her PPS, LBR hopes he is as efficient in his new job!

British Nuclear Forum "the voice of Britain's nuclear power industry" represents some 70 organisations, and publishes a jolly little propaganda sheet, ***Nuclear Forum***. The magazine, like the organisation, is unashamedly pro-nuclear. A recent issue carried a 'think' piece from BNF Director-General Dr John Gittus, under the splendid headline "Why I think Nuclear Power is a good thing for Britain". The title is worthy of a second rate school essay, sadly the content is not of such a high standard.

The same issue carried the news that "The League of Red Cross and the Red Crescent have sponsored a study into health problems among people living near Chernobyl. An international team of health experts on a 10-day visit to the Soviet Union found that most of the health problems were linked to public anxieties and misconceptions about radiation." Before LBR could dispatch reassuring back copies of ***Nuclear Forum*** to the citizens of the Ukraine, to cure them of their ills, he received a response to the article from Renny Nancholas, head of the British Red Cross international aid department and leader of the mission to Chernobyl. Nancholas stated that "While psychological aspects were a factor, many, perhaps even most health problems were directly related to the effects of radiation."

The recent select committee report ***The Cost of Nuclear Power*** was scathingly critical of Cecil Parkinson and Malcolm Rifkind. The merchant bankers for the shambolic electricity sell-off also took some stick. "We are not satisfied that the Department [of Energy] was always well advised by its financial advisers, Kleinwort Benson", says the report, which identifies three instances where advice was considered "inadequate". Kleinwort Benson are highly respected in financial matters and their "inadequate" advice on nuclear costs is all the more surprising when you discover they are amongst the 70 member organisations of the above mentioned British Nuclear Forum!

Three ways to promote safe energy

Three ways to help SCRAM: fill in the appropriate section(s) together with your name and address and return the form to the address below.

1 I would like to **subscribe** to the **SCRAM Safe Energy Journal**, and I enclose an annual subscription fee of:

- ☐ £12.50 (ordinary)
- ☐ £15 (overseas)
- ☐ £30 (institutional)
- ☐ £5 (concession)
- ☐ £20 (supporting)
- ☐ £100 (life)

2 I would like to make a **donation** to SCRAM and enclose a cheque for:

☐ £10 ☐ £50 ☐ £100 other £_____

Name _____

Address _____

_____

Post code _____ Phone No. _____

To:
SCRAM, 11 Forth Street, Edinburgh EH1 3LE

3 I would like to help pay SCRAM's wage bill with a regular monthly donation of:

☐ £1 ☐ £5 ☐ £10 other £_____

To the Manager _____

_____ (your Bank)

Address (your Bank) _____

_____

_____

Please pay on _____ (date) the sum of

_____ (amount) from my account number

_____ to the Royal Bank of Scotland, 142/144 Princes Street, Edinburgh (83-51-00) for the credit of SCRAM No.2 Account 258597 and make similar payments monthly until further notice.

Signed _____ Date _____