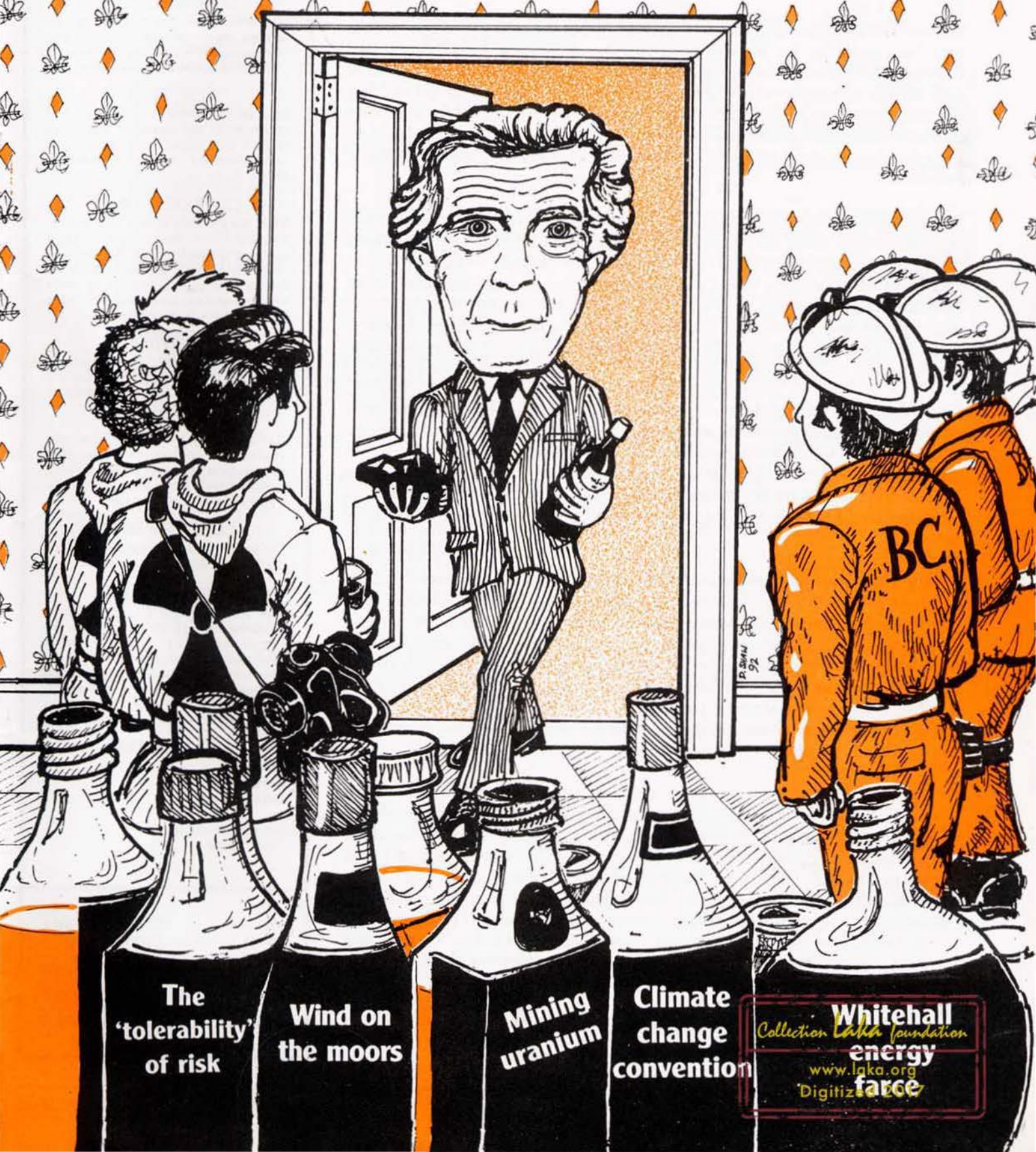


SAFE ENERGY

No.92

December 1992/January 1993

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The
'tolerability'
of risk

Wind on
the moors

Mining
uranium

Climate
change
convention

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COMMENT

FROM a squash court to the High Court, the nuclear industry has come a long way in the last 50 years.

When on Wednesday the second of December 1942, in a disused Chicago squash court, the first nuclear chain reaction was demonstrated by a team led by Enrico Fermi. One of his colleagues, a Hungarian theoretical physicist called Leo Szillard, turned and commented: "This will go down as a black day in the history of mankind."

Indeed, it was their work that led directly to the A-bombing of Hiroshima and Nagasaki; to the accidents at Windscale, Three Mile Island and Chernobyl; the arms race; a mountain of surplus plutonium; massive radioactive atmospheric pollution from weapons testing; and the turning the Irish Sea into a radioactive stew. Their work has led directly to British Nuclear Fuels being taken to court by people who have lost members of their families to cancer which they believe was caused by reprocessing at Sellafield.

Now 50 years after the world's first nuclear waste was created, it is only just becoming clear to people that there is no solution to the waste riddle. It is becoming clear that the lust for atomic weapons which spawned reprocessing to get plutonium has led us into the unenviable position of possessing so much plutonium that, in the words of the deputy general director of the International Atomic Energy Agency, William Dircks, it poses "a major political and security problem worldwide."

One thing is becoming clear even to the mandarins in Whitehall who have rubber-stamped the nuclear industry's activities for over four decades: reprocessing is an anachronism. The government now seems to be looking for a way to stop Britain from further pushing the world down a road to the plutonium economy and to stop further radioactive pollution from Sellafield threatening lives. It is looking for a way to stop Thorp — Sellafield 2.

At the same time Scotland's state-owned nuclear utility, Scottish Nuclear Limited, is presenting evidence to a public inquiry into the building of a dry store for the nuclear waste generated at its Torness AGR nuclear power station, as an alternative to reprocessing. The anti-nuclear movement has been calling for dry storage for a number of years, not as a solution to the waste problem but as a damage limitation exercise in dealing with waste already produced. Calls for the adoption of dry storage have always been tempered with the demand that nuclear waste production is stopped.

Since that time half a century ago when the world first began generating its deadly legacy of atomic effluent, we have come no closer to finding an acceptable method of nuclear waste management or decommissioning. It is worth remembering the words of Sir Brian Flowers in the 1976 6th Report of the Royal Commission on Environmental Pollution. It is "irresponsible and morally wrong to commit future generations to the consequences of fission power unless it has been demonstrated beyond reasonable doubt that at least one method exists for the safe isolation of these wastes for the indefinite future."

It was morally wrong 50 years ago, it was morally wrong in 1976, and it is morally wrong now.

SCRAM's *Safe Energy* journal is produced bi-monthly for the British Anti-Nuclear and Safe Energy movements by the Scottish Campaign to Resist the Atomic Menace. Views expressed in articles appearing in this journal are not necessarily those of SCRAM.

scram, skram, v.
to shut-down a nuclear
reactor in an emergency.

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SAFE ENERGY

FEATURES

8 The 'tolerability' of nuclear risk

A new report from the Health and Safety Executive updates its views on "The tolerability of risk from nuclear power stations". **Fred Barker**, a freelance writer and consultant on nuclear issues, reports on some significant changes and the claim that the risk from existing nuclear power stations is intolerable.

10 Wind on the moors

The rush of applications for wind farms under the Non-Fossil Fuel Obligation has caught planning authorities unprepared. **Cllr Steve Martin**, Chair of the General Purposes Committee of Todmorden Town Council and former SCRAM journal editor, has closely followed the progress of a wind project in the southern Pennines.

12 Mining uranium

Uranium mining is an essential but often overlooked link in the nuclear power chain. **Penny Boyle**, a geology student, examines the environmental problems of mining uranium, from radon gas to groundwater contamination.

14 Climate change convention

Encompassing so many other issues, climate change has become a prime environmental concern. **Paul Gill**, a graduate in environmental technology, looks at recent international policy developments and considers the difficulties of implementation.

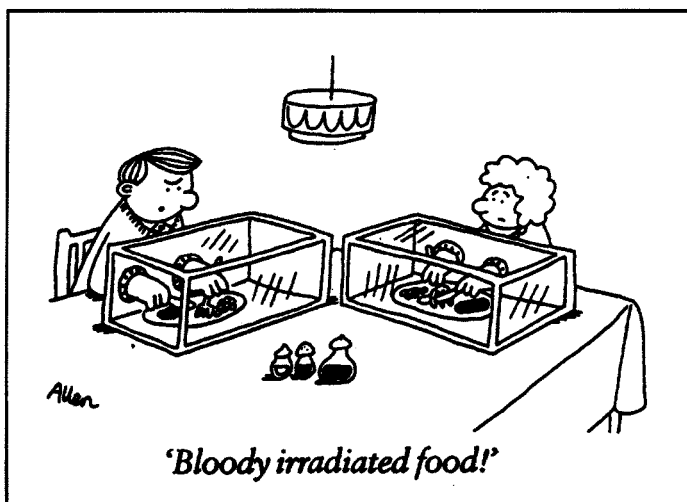
17 Whitehall energy farce

Far from leading from the front, the energy saving efforts of government departments have been a dismal failure. **Andrew Warren**, the Director of the Association for the Conservation of Energy, scrutinises Whitehall's record and finds some dubious statistics.

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From: MAUM Newsletter



From: The Phoenix



Sizewell subsidy

REVELATIONS that Nuclear Electric (NE) has used money from the Nuclear Levy — which is intended to cover liabilities inherited from the Central Electricity Generating Board — to provide capital for the construction of Sizewell B have further fuelled growing calls for the levy to be cut and the Magnox stations to be closed.

While 31 coal mines are under the threat of closure because they cannot compete under free market conditions the obvious unfairness of subsidising nuclear power because it too cannot compete in a free market has become a rallying point for those concerned about the future of the British coal industry and the 30,000 miners who are poised to join growing dole queues.

Last year state owned NE received £1,265 million from the Levy which is paid as an 11% tax on all other fuel sources — except renewables — by the electricity consumer in England and Wales. In evidence to the Trade and Industry Select Committee, NE admitted that some £250 million has been put towards the costs of their new nuclear station at Sizewell, which it is estimated will produce power at twice the cost of a modern coal station.

An examination of the company's accounts by Anthony Scrivner QC, who is producing a report on the pit closures, showed that very little of the Levy — £180m — had been set aside last year for decommissioning.

Yet when questioned about the Levy

in October, Trade and Industry Secretary Michael Heseltine, told Parliament: "The subsidy is to deal with the decommissioning of old and unsafe plants. I defy the Labour Party to suggest that I should not carry out my statutory duty to make those plants safe." NE also said: "The Levy is not intended to be a subsidy for NE's ongoing commercial operations."

Scrivner concludes: "A loss making industry is being shored up by government subsidies at the expense of the coal industry which, unlike the nuclear sector, has been subjected to a thorough review to eliminate wastage and to streamline and modernise its equipment and procedures."

Scrivner, former chair of the Bar, believes the Levy may be in breach of the Treaty of Rome and has indicated his willingness to fight such a position in the courts should an interested party wish to take it up. The NUM, the Union of Democratic Miners and Nottingham County Council are all considering bringing such an action.

Cash flow

In defending its actions, NE said money from the Levy was integrated into its cash flow rather than being paid into a special fund. Surplus cash at the end of each year, says NE, goes straight to the Treasury.

NE Chair, John Collier, told the select committee that if the Levy had not been used for Sizewell B then money would have to have been borrowed from the Treasury. However, as the company is supposed to be operating along

commercial lines, this is exactly what should have been done. The cost of borrowing on a commercial basis should then be added to the estimated costs of power from Sizewell.

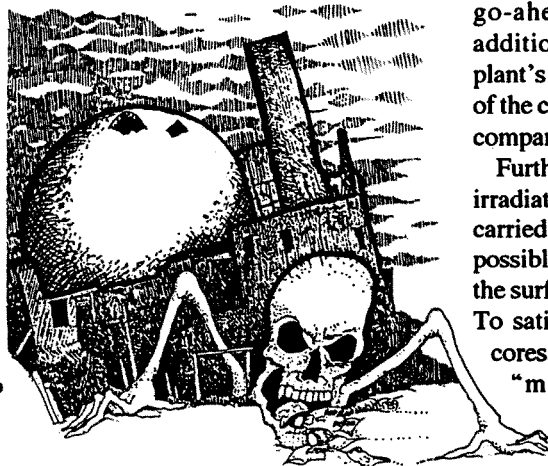
Having misdirected money from the Levy, NE published its half yearly results on 7 December, claiming to be on course for Levy-free profit by 1995. Reporting the results Collier said NE "has been able to point to clear evidence that we are making nuclear power in this country a commercial success."

While Heseltine, in the face of overwhelming evidence to the contrary, maintains that the Levy is solely in place to fund the decommissioning of NE's seven "old and unsafe" Magnox reactors, many in the energy industry now believe the government will have no choice but to cut the Levy and close some or all of the Magnoxes. So far NE has resisted all such suggestions arguing that early closure will result in a loss of £2 billion in possible income with an additional burden on the Public Sector Borrowing Requirement (PSBR) of £200 million annually and 17,000 job losses over the next decade.

However, in evidence to the select committee, Collier admitted that new clean-up liabilities are being generated at a rate of £600 million annually. But, according to Greenpeace: "NE's own reference plan shows that only £60m would be incurred per station in the first five years of decommissioning." This would give a total cost of £420m, 8% of the forecast Levy for the period. Indeed, Greenpeace points out: "The first stage of decommissioning of the Berkeley Magnox station has reportedly been completed at well below budget — suggesting the cost of shutting down Magnox could be lower still." □

Bradwell continues

NUCLEAR Installations Inspectorate (NII) clearance has been given to Nuclear Electric (NE) for the continued operation of its twin Magnox station at Bradwell in Essex.



Willi Langlands

However, a full licence to operate the plant for a further ten years has not yet been granted. The NII says there are two areas where it has "some reservations". It has told NE that it is still concerned about the possible embrittlement in the reactor pressure vessel welds ("Magnox go-ahead", *Safe Energy* 87). In addition, it is concerned about the plant's graphite cores, as NE's analysis of the cores to date has relied heavily on comparisons with other Magnox cores.

Further experiments with specimens irradiated at Bradwell will have to be carried out, and the NII wants NE, if possible, to take samples from inside the surface of the actual pressure welds. To satisfy the NII on the state of the cores, NE will also have to conduct a "more rigorous site-specific structural analysis ... taking into account the mechanical

and physical properties and the relevant loadings, to demonstrate their acceptability for extended operations." This work must be completed by March 1993.

Otherwise, says the NII, NE has been able to make "a satisfactory case" for most other areas of the plant for a further 10 years of operation.

NE is keen to operate all seven of its twin Magnox stations beyond 30 years, because it claims that once they pass this barrier then all capital costs will have been covered and marginal costs are extremely low — "the cheapest electricity in the country," at "well below 1.5p/kWh."

In all NE is expected to complete an eight-month station upgrade programme costing £12 million before the middle of next year, when the NII will consider extending the licence to cover a ten-year period. □

Thorp stumbles

REELING under a welter of criticism the once seemingly impregnable Thermal Oxide Reprocessing Plant (Thorp) at Sellafield now looks as if it may fall victim to the relentless ravages of economic and political reality and never open.

The completed plant, costing £2.85 billion, should have begun reprocessing spent fuel from around the world but is lying dormant, awaiting the outcome of an eight-week consultation into proposed new discharge limits for the Sellafield site. Limits which, if approved, would see discharges to the sea and air spiral by 487% and 7,962% respectively. Such a prospect has swollen the postbag of HM Pollution Inspectorate's (HMIP) — who are responsible for issuing authorisations — with over 36,000 letters of protest.

It is now becoming increasingly likely that following the consultation period BNFL will not be granted a new licence to pollute, but that a second public inquiry into the plant will be called, under the 1960 Radioactive Substances Act. According to the Financial Times Business Information (FTBI) publication *Power in Europe* "an environment department spokesman said that a public inquiry 'of some kind' would be likely."

BNFL is keen to avoid a second inquiry which it says could delay the opening of the plant by 18 months — or permanently. The company Chair, John Guinness, has urged the Government not to call an inquiry, saying it would cost thousands of jobs at Sellafield. BNFL also said that, without Thorp, Sellafield would close within 10 years. According to Guinness, there are "no technical reasons" for delaying the opening of Thorp, adding: "There are no new factors which were not looked at by the public inquiry in 1977."

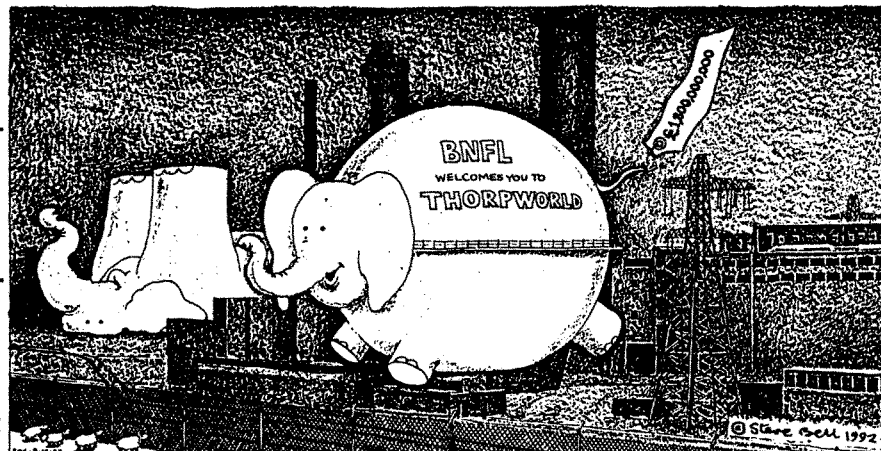
Changes

However, a number of things have changed since 1977. The downturn in world nuclear programmes means that the predicted shortfall in uranium has not occurred. Indeed the spot price for uranium on the world market has dropped from US\$46/lb to around US\$7.7/lb. The FTBI's *Energy Economist* magazine comments that it is "highly unlikely" that uranium prices will reach "levels where reprocessing would become economic in the foreseeable future."

Since 1977, estimates of the risk caused by radiation exposure have increased significantly. Since 1977, the belief that fast breeder reactors would take over from fission has disappeared. The government has said the Dounreay prototype fast reactor will close in 1994, and they have announced the UK's withdrawal from a joint European development project. Therefore, there is no longer any rationale — if there ever was — for producing vast quantities of plutonium and uranium from spent nuclear fuel.

According to BNFL, not opening Thorp

Steve Bell — reproduced with permission



would cost Britain up to £3 billion. David Bonser, director of the plant, said £900 million in future earnings would be lost, adding that the company would also have to pay back "a good whack" of the £2bn foreign customers paid in advance towards construction costs. He also said the company would have to send back the 2,500 tonnes of foreign spent fuel stockpiled at Sellafield.

However, most contracts for reprocessing at Sellafield contain a *force majeure* clause which limits BNFL's liability in certain circumstances, including war, riot, revolution, fire and flood, "or restraint of government or any authority having jurisdiction in respect of the performance of any obligation under this agreement." Although such clauses are open to interpretation and would probably involve inter-government negotiation, they offer BNFL a way out of paying large sums in compensation if the government stops the plant from opening.

No penalties

According to William Walker of the Science Policy Research Unit, the initial contracts are heavily in BNFL's favour: "My understanding is that the British could get out of these things with absolutely no penalties."

BNFL claims that the plant can still make money and forecasts a profit of £500m from a turnover of £9 billion in its first ten years of operation, even after allowing for the cost of decommissioning. However, estimates of decommissioning costs are rising, they now stand at £900 million, £150 million higher than government estimates made in 1990.

Such are the uncertainties over future costs at the plant that the Government has refused to underwrite the contracts BNFL says have been signed so far. In a confidential letter to the UK's two state owned nuclear utilities, Nuclear Electric (NE) and Scottish Nuclear (SN), the government said it was not prepared to pick up the bill for decommissioning the reprocessing plant, handling the waste and meeting the costs of future environmental regulations. Contracts worth £13bn with NE and £3bn with SN were signed "in principle" and were dependent on government underwriting. They will now have to be renegotiated to include the possibility of price hikes such as those which have plagued the

industry over the last three decades as environmental standards improve. This may lead to the nuclear utilities vastly reducing their commitment to reprocessing in favour of dry storage. SN already plans to dry store much of the spent fuel from their Torness and Hunterston AGRs.

Further doubt has been cast upon the economic integrity of Thorp by the leaking of confidential documents which suggest two German utilities — VEBA and RWE — are considering cancelling all or part of their contracts. German business represents 13% of Thorp's baseload operation.

It has also emerged recently that the government has breached European Community law by providing BNFL with £2.5bn worth of state aid without informing the Commission. According to Michael Beloff QC, acting on behalf of Friends of the Earth, the money could not be provided legally without informing the Commission. His opinion is backed by Greenpeace lawyers in Britain, Germany and Ireland. Unless BNFL can show that the funds could have been obtained from private capital markets — a very unlikely prospect — Greenpeace and FoE say the legal opinions give rise to three key questions relating to the viability of Thorp:

- has BNFL used part or all of this financial "feather bed" to underwrite the building of the new Thorp plant?
- if so, does this imply that all of BNFL's contracts for reprocessing spent nuclear fuel, signed on the provision of unlawful state aid, should be declared null and void?
- how will the Government require BNFL to repay any financial benefits 'traceable' to any unlawful state aid?

Greenpeace and FoE have written to trade and industry secretary Michael Heseltine, providing copies of their legal advice, demanding that he resolves the issue and prevents Thorp from being started up. A copy of FoE's legal opinion has also been sent to Leon Brittan, the Commissioner responsible for competition policy, to back up a complaint to the Commission made by Greenpeace in October.

Walker, who a month two ago would have said Thorp's opening was inevitable, now believes the odds are against it: "It would be a very hard decision for the government to make, but there are so many people who would prefer it not to happen." □

Cancer cases

AS the debate over BNFL's application to increase radioactive discharges from its Sellafield plant gets into full swing, a legal test case, in which the plant's operations have been accused of causing two leukaemias, has begun at the High Court in London.

The case is being brought by Leigh, Day and Co on behalf of Elizabeth Reay and Vivian Hope. Reay, formerly of Whitehaven in Cumbria, believes that the leukaemia which took the life of her 10 month old daughter in 1962 was caused by her husband George's employment at Sellafield. George Reay, who also died of cancer, worked as a fitter at the plant and is said to have suffered the highest radiation dose of any of the Sellafield workers.

The father of the second litigant, Vivian Hope, also worked at the plant as a fitter. Hope, of Seascale, was diagnosed in 1988 as having non-Hodgkin's lymphoma, a leukaemia related illness — chemotherapy has left her partially disabled and sterile.

Damages have already been agreed and set at £150,000 for Reay and £125,000 for Hope if BNFL is found to be liable.

A 1965 Act of Parliament which imposes a strict liability on the nuclear industry not to cause injury to either person or property means the litigants need not prove that BNFL was negligent, said Benet Hytner, QC for Reay: "The plaintiffs will succeed if they can prove, on the balance of probabilities, that radiation from Sellafield was a material contributory cause of the diseases contracted."

At the start of the hearing, Hytner told the Court that the claims were based on four main allegations:

- damage to the sperm of the fathers

before conception, by exposure to radiation during their employment;

- exposure directly to radiation outside the plant from substances emanating from Sellafield while the children were still in the womb;
- exposure to radiation post-natally — especially pertinent in the case of Hope, since her lymphoma in the spine was not diagnosed until 1986 (she had worked at the plant on library, cleaning and clerical jobs); and
- exposure of the mothers to radiation from Sellafield before conception, causing damage to the mothers' eggs.

The case against BNFL leans heavily on the work of Martin Gardner, head of environmental epidemiology at Southampton University, who published a study in 1990 which found that children of fathers who worked at Sellafield ran twice the risk of developing leukaemia than other children in the area. Further, Gardner said that men who received a high dose of radiation during their working life stood a six to eight times greater risk of fathering children with cancer.

No evidence

BNFL says there is no medical evidence linking Sellafield with the cancers, dismissing the claims as "totally unfounded". They plan to present evidence from around the world which disproves any theory that leukaemia can be passed to offspring through the genes.

On the second day of the hearing Kenneth Rokison, QC for BNFL, described the Gardner hypothesis as fatally flawed. Arguing that it depended upon very small numbers and included a case which ought to have been excluded. "Its fragility is demonstrated by the fact that ... if one case were to be removed or re-classified for any reason, statistical significance would probably disappear," he said. Adding, "It has not been shown that leukaemia has a genetic or at least a strong genetic component." Rokison further rejected Gardner on the basis of a

study of 76,000 children born to survivors of the atomic bombs at Hiroshima and Nagasaki which he claimed showed a decrease in the incidence of leukaemia.

BNFL also denied earlier charges of being cavalier in its approach to accuracy. Hytner told the court that the levels of radiation to which people living near to Sellafield have been exposed are far higher than BNFL have admitted, adding that the company could not be relied upon to provide accurate information.

Hytner said that in 1984 BNFL gave the total releases of plutonium from the plant as 67 gigabecquerels (Gbg), however two years later this was revised upwards to 174Gbg. Now a survey conducted by Professor Steve Jones, an employee of BNFL, "puts the total releases of plutonium prior to 1984 at the staggering figure of 3,400Gbg." Hytner said it was "bewildering" that at the time Jones made his findings known to management an application for new discharge permits for the plant had been lodged using the "old figures".

Counsel for BNFL rejected the allegation saying: "That assertion is not only resented by BNFL but is emphatically denied." Rokison said that Professor Jones' findings had been cautious and extremely pessimistic, a fact he claimed was confirmed by a second independent study.

It has taken Leigh, Day and Co over three years to prepare the case, and more than half a million pages of documents were moved to court 17 in the Royal Courts of Justice for the beginning of the trial on 26 October.

The case is expected to run for at least 6 months. It will cost an estimated £10 million, and involve over 50 experts from all over the world. Such is the complexity and uniqueness of the case that the Judge, Mr Justice French, will, for the first time in a British civil case, have an assistant — a young barrister — to help keep track of all the documentation.

If the first case is successful it will lead to around 40 more cases being brought against BNFL, by Leigh, Day and Co. □

Cancer cables

SWEDEN'S National Board for Industrial and Technological Development is convinced that exposure to electromagnetic radiation from overhead power lines can cause childhood leukaemia and is drawing up a list of countermeasures for its government.

Jaak Nöu, director of the board's department of electrical safety, says: "We will base all our future work on the assumption that there is a link between exposure to electromagnetic radiation and childhood leukaemia ... I believe

that the link is 80% correct, and so we must take action now and not wait until we have proved everything 100%."

The board have been convinced by two recent Swedish studies. The first, carried out by Maria Feychting and Anders Ahlbom, demonstrates that children younger than 15 are 2.7 times as likely to develop leukaemia when exposed to more than 0.2 microteslas. The relative risk rises to 3.8 times for those exposed to an average of 0.3 microteslas. This is the first time a relationship between the dose of radiation and the risk of cancer has been demonstrated.

A second study, by Brigitta Floderus of the Swedish National Institute of Occupational Health, uncovered a link between some forms of adult cancer and exposure to electromagnetic radiation. She concluded that there is a positive link between exposure to the highest level of radiation and two forms of cancer — chronic lymphocytic leukaemia and brain cancer.

Both studies involved relatively large samples — Feychting and Ahlbom's involved 500,000 and Floderus's used 1,632 — and therefore offer a good degree of accuracy. □

Plutonium shipments

JAPANESE authorities have expressed surprise over world-wide hostility to their shipments of plutonium from Cherbourg in France, saying that plans to bring a further 30 tonnes of plutonium from France and the UK will now be reconsidered.

Toichi Sakata, director of the Science and Technology Agency's nuclear fuel division, said nobody involved had expected the shipment to get such "high public attention". Japan began a review of its long-term strategy for nuclear energy in September, and according to an official from the Japan Atomic Energy Commission: "Plutonium policy is certainly one of the areas to be reviewed again."

A number of countries have told the Japanese to keep the nuclear leper ship — the *Akatsuki-maru* and its lightly armed purpose built escort the *Shikishima* — out

of their territorial waters. They include South Africa, Australia, New Zealand, Chile, the Philippines and Indonesia. At the beginning of October the Asia Pacific Forum called upon the Japanese to "halt" their planned plutonium shipments.

The gathered nations are extremely concerned about the secrecy surrounding the shipments, and although they could be called upon to provide an emergency port in the event of an accident, they have neither been consulted nor informed about the route the shipment will take.

The Forum has demanded that the United Nations obtain from Japan all engineering information needed for "an independent assessment [of the shipment] by a select group of maritime experts" and strengthen safety standards for shipment flasks so that the can withstand a maximum credible accident. The nations also want the UN to seek an opinion from the International Court of Justice on the legitimacy of the "unilateral act by Japan to ship the ultra-hazardous

cargo through the global commons of the world's seas."

Governor Lorenzo I De Leon Guerro of the Commonwealth of Northern Mariana Islands, summed up the mood of the forum saying: "Damage from plutonium would be eternal. Our Pacific islands would stand like tombstones in a dead sea."

The supposedly secret voyage is now becoming one of the most followed in maritime history.

At the beginning of November, French commandos seized the Greenpeace boat the *Moby Dick* and held the crew at gunpoint to prevent the group interfering with the loading of the plutonium onto the *Akatsuki-maru*. Later another Greenpeace boat — the *Solo* — was rammed by the *Shikishima* when it was continuing the chase from Cherbourg. However, the group are determined to follow the plutonium ship all the way back to Japan, so they can warn countries along the route of the *Akatsuki-maru's* presence. □

Fast breeder: Euro failure

AFTER 40 years and £4 billion the government has decided it is time to pull out of fast breeder reactor research, and is cancelling its £13 million 'standing order' to the European Fast Reactor Project.

While facing a barrage of criticism from both sides of the House of Commons, energy minister Tim Eggar said: "During the last 40 years we have spent about £4 billion in today's money on that research, and we have managed to come up with a basic design, which will enable us to proceed to a prototype commercial development, should it ever be economic to do so. Given the likely cost of uranium and energy demand, the industry has decided not to give priority to PFR [prototype fast reactor] research, and the government

and the nuclear industry have decided that further expenditure is not justified."

Tory energy experts joined in the criticism of the government's decision. Sir Trevor Skeet said: "Is it not odd that the Europeans, the Japanese and the Americans are going ahead with fast breeder reactors and that in the UK we are beginning to abdicate responsibility?"

However, all is not rosy in the two European countries which are involved in fast reactor research. While the Germans built a fast reactor at Kalkar it was never opened, and France's Super Phenix is lying broken and licenceless. The USA has never built a fast reactor which produced electricity for the grid, and is involved in research at a very low level. Only Japan could be said to have an active programme.

The current round of government funding will run out in March 1993, when around 240 jobs are expected to be lost. □

Plutonium flights

NUCLEAR fuel containing several tonnes of plutonium is being flown to Wick, in the north of Scotland, from Germany for storage at Dounreay.

The bulk of the fuel, which was fabricated for the ill-fated SNR-300 German fast reactor at Kalkar, is currently being stored by Siemens in Hanau. However, Siemens now requires space to store its own spent fuel and has threatened SBK, which owns the fuel, with expensive compensations action if it is not removed soon.

SBK has paid Dounreay £400,000 to store the fuel. When the deal was originally signed AEA Technology, Dounreay's operators, had hoped to use it in their prototype fast reactor, however, that reactor is to close in 1994, leaving the AEA with no use for the fuel. The company are now hoping to win a contract to refabricate the fuel for use or disposal elsewhere. If no such contract is agreed the fuel will have to be removed from Dounreay. □

Sea dumping

PROPOSALS for a permanent ban on dumping nuclear waste in the sea were defeated at a meeting of the London Dumping Convention (LDC) held in London at the beginning of November.

The Danish proposal to extend the current 10-year moratorium, which ends in 1993, into a permanent ban attracted considerable support from the 44 nations present. However, such a move would require a two-thirds majority. Among those who voted against were Britain, France, the USA and Japan. A permanent ban will not be reconsidered until 1994, a number of months after the current moratorium ends.

While agreeing to very little of any significance, one vote was pushed

through: it is no longer the LDC but simply the London Convention.

■ Meanwhile, a dispute is brewing over what to do about a Soviet nuclear submarine which sank off north Norway in April 1989.

A report on US television at the end of November included an interview with Nicolai Nosov, a Soviet submarine designer who led a Russian expedition to inspect the vessel, which revealed that the submarine's reactor is leaking caesium 137. Nosov also expressed the fear that the torpedo bays might be disintegrating and releasing plutonium.

The report also included an interview with a Russian naval captain who said "next year will be our last chance and then it will be catastrophic. Plutonium will hit the water and it will be all over. The entire region will

be polluted, and the food chain affected."

Norwegian scientists, however, say there is no evidence of contamination in fish. However, last year the Norwegian government told the world's media that the submarine was leaking, and some scientists say the Russian results match their own.

The Norwegian government believes that any move to raise the corroding vessel would present an unacceptable risk.

"Atmospheric nuclear testing over the years has released tonnes of plutonium, much of it into the sea," said Knut Gussgard of the Norwegian Nuclear Energy Safety Authority. "We believe radiation leaking from the submarine is not a threat to fisheries."

The biggest danger, he said, would be if the vessel were raised and the warheads exploded or the reactor restarted. □

The Health and Safety Executive's 1988 discussion document, "The tolerability of risk from nuclear power stations", attracted a large amount of criticism. The HSE has just brought out a new version which contains some significant changes reports FRED BARKER, a freelance writer and consultant on nuclear issues.

The 'tolerability' of nuclear risk?

IN 1988, responding to a recommendation by the Inspector at the Sizewell B Public Inquiry, the Health and Safety Executive (HSE) published a discussion document on the tolerability of risk.⁽¹⁾ The Inspector, Frank Layfield, considered that there was insufficient public information to allow an understanding of the basis for the regulation of nuclear safety, and so recommended that the HSE publish a document to enable public, expert and parliamentary discussion.

Although the discussion document went a long way to explaining how the HSE reaches its decisions on nuclear safety in a clear and useful way, its proposals on levels of maximum tolerable risk were widely criticised, particularly at the Hinkley Point C Public Inquiry. As explained below, the inquiry Inspector, Michael Barnes, accepted a number of the points made by objectors and suggested more stringent levels of maximum tolerable risk.

In October 1992, the HSE finally published a revised version of its 'Tolerability of Risk' (ToR) report,⁽²⁾ which contains significant changes in its discussion of proposed levels of maximum tolerable individual and societal risk.

Individual risk

Individual risk addresses the question of the risk to any person living within a set distance from a plant or who follows a particular pattern of life that might subject them to the consequences of an accident.

In the original ToR document, the HSE based the 'tolerability' limit for workers in the nuclear industry on the most risky occupational groups, and then based the similar limit for the public on that same number reduced by a factor of ten. This produced a maximum tolerable risk of early death or fatal cancer of 1 in 10,000 per annum for any individual member of the public. Critics pointed out that this was the same as the average annual risk of dying in a traffic accident, and ten times greater than the average death rate of workers in the safest industries

in the UK. A number of objectors at the Hinkley Inquiry therefore called for the maximum tolerable risk to a member of the public to be set at 1 in 100,000, ie, ten times smaller than that proposed by the HSE.

Societal risk

Societal risk addresses the question of the risk to society as a whole. In the original ToR document, the HSE noted that the risk of a major accident at the Canvey Island industrial complex is about 1 in 5,000 a year; that the design specification of the Thames Barrier leads to a risk of it being overtopped by a freak tide of less than 1 in 1,000 a year; and that the predicted approximate annual risk of a major aircraft crash is also 1 in 1,000. From these figures, the HSE deduced that where there is little choice but to accept a major societal risk, society requires the risk to be less than 1 in 1,000 and if possible less than 1 in 5,000 a year. Then, taking into account "the public alarm and perhaps the economic consequences of an important release of radioactivity from a nuclear reactor", the HSE proposed a maximum tolerable level of societal risk for a considerable uncontrolled radiation release anywhere in the UK of 1 in 10,000, ie, two times smaller than the risk of a major accident at Canvey Island. This level of risk was also widely criticised as being too high.

Despite its failings, the Inspector's report was a significant step forward in the discussion of tolerable risk. Barnes' fundamental point was that a risk should only be borne or imposed if justified by a sufficient corresponding benefit. In other words, any assessment of what level of risk is tolerable must have close regard to the proposed benefit. This presented a severe difficulty for the HSE as its statutory functions related only to regulation and safety, so that it had had to provide a guide to a tolerable level of risk irrespective of considerations of any benefit.

In contrast, the Inspector adopted a four stage process to assess whether

the risk from a new PWR would be tolerable:

1. an assessment of the benefits of the project;
2. a comparison with the levels of risk which are tolerated in other areas of life;
3. a judgment of maximum tolerable levels of risk in the light of 1 and 2 above; and
4. an assessment of the risks from the proposed PWR, and a comparison with the maximum tolerable levels derived in 3.

Using this process and with specific regard to the proposed PWR, Barnes recommended a maximum tolerable individual risk of early death or of fatal cancer of 1 in 100,000 a year for the public, and a maximum tolerable additional societal risk of an accident leading to 100 or more deaths of 1 in 100,000 a year. Going on to stage 4, after weighing up the evidence presented to the inquiry, Barnes had no hesitation in concluding that the individual risk to the public from the normal operation of a PWR and from accidents was below the level of risk which was tolerable. However, with regard to societal risk, the Inspector was far less certain. Using evidence provided by the CEBG and National Radiological Protection Board (NRPB) he estimated that the risk of an accident at the proposed PWR which would cause 100 or more deaths was about 1 in 650,000 a year from plant initiated faults. As Barnes stated: "The question is whether the additional risk which derives from other factors (such as human error) is such that the societal risk exceeds the maximum tolerable level" (para 49.20, *Hinkley Report*).

Barnes concluded: "It seems to me unlikely that the additional risk from other factors would increase the risk by a factor of six or more, but the other factors are largely unquantifiable and such an increase does not seem to me to be beyond the bounds of what is credible. In my opinion it is not satisfactory to guess, and the conclusion which must be reached on the evidence is that there is no material from which to derive firm judgment on whether the societal risk would or

would not exceed the maximum tolerable level."

In order to limit the impact of this somewhat surprising conclusion, Barnes stressed that the subject of societal risk was fraught with great uncertainty, reducing the confidence which could be placed on the estimates and the value of the whole process. In short, the Inspector was not prepared to recommend the refusal of consent for Hinkley C on the basis of his judgments concerning the tolerability of societal risk.

The revised ToR document

With regard to individual risk, the revised ToR document deals with the Hinkley inquiry Inspector's conclusions in the following way: "We consider that Barnes was in effect saying that in order for him to find the Hinkley Point C proposal acceptable, the maximum risk to any member of the public from its operation should be 1 in 100,000 per annum. This is not the same as saying that for every industrial plant in the UK the maximum tolerable risk to any individual member of the public should be less than 1 in 100,000 per annum. We propose to maintain our existing position that a risk of 1 in 10,000 per annum to any member of the public is the maximum that should be tolerated from any large industrial plant in any industry ... But, in accordance with Barnes' findings, we propose to adopt a risk of 1 in 100,000 per annum as the benchmark for new nuclear power stations in the UK, recognising that this is, in the case of a new station, broadly achievable and measurable." (para 173)

No clear justification is provided for why Barnes' maximum tolerable risk should not also apply to existing nuclear power stations. There is the implication, however, that Barnes' level may not be achievable for existing stations. This is a point which is being pursued with the HSE by the Nuclear Free Local Authority steering committee (NSC).

With regard to actual levels of individual risk from nuclear power stations, the HSE states: "... most people in the vicinity are at or near the 1 in 1 million level and well below the benchmark of 1 in 100,000 per annum. Some people might be near to the benchmark, while a handful could be a little above that level." (para 177)

With regard to societal risk, the revised ToR document fails to mention Barnes' view that the maximum tolerable risk of an accident at a new PWR leading to 100 or more deaths should be 1 in 100,000. Instead, the document provides a general discussion, pointing out that in principle it would be possible to suggest a 'tolerability limit' for a hypothetical programme of modern reactors. However, it declines to suggest such a limit, and concludes that it is not for "the regulatory authorities but for Parliament and the public to weigh the benefits of nuclear power with the risk we have outlined" (para 190).

It should also be noted that in relation to the actual risk of major accidents, the revised ToR document argues that it is possible to narrow down the uncertainties associated with what the Inspector described as the unquantifiable factors that could lead to a major accident. The document argues that for human errors relating

to skill, slips and lapses, there are well established models and data that give reasonable numerical estimates of human error. Although this leaves a residual difficulty with the quantification of 'knowledge-based' errors. The document concludes that the influence of other factors will be to increase the probability of large releases of radiation by less than a factor of ten.

It then states that: "so far as can be calculated, and taking as much account of the human factor as is practicable in modern forms of risk calculation, a programme of between 20 and 50 modern reactors would have a similar chance of causing deaths to some hundreds of people as the installations at Canvey Island" (para 186). As stated earlier, the risk of such an event at Canvey Island is 1 in 5,000 a year. This implies that the HSE takes the view that the chance of a large release from a single modern reactor is between 1 in 100,000 and 1 in 250,000 a year. This range actually encompasses the Hinkley Inspector's judgment of the maximum tolerable risk from a new PWR of 1 in 100,000 a year, raising further doubts over the tolerability of societal risk from any new PWR.

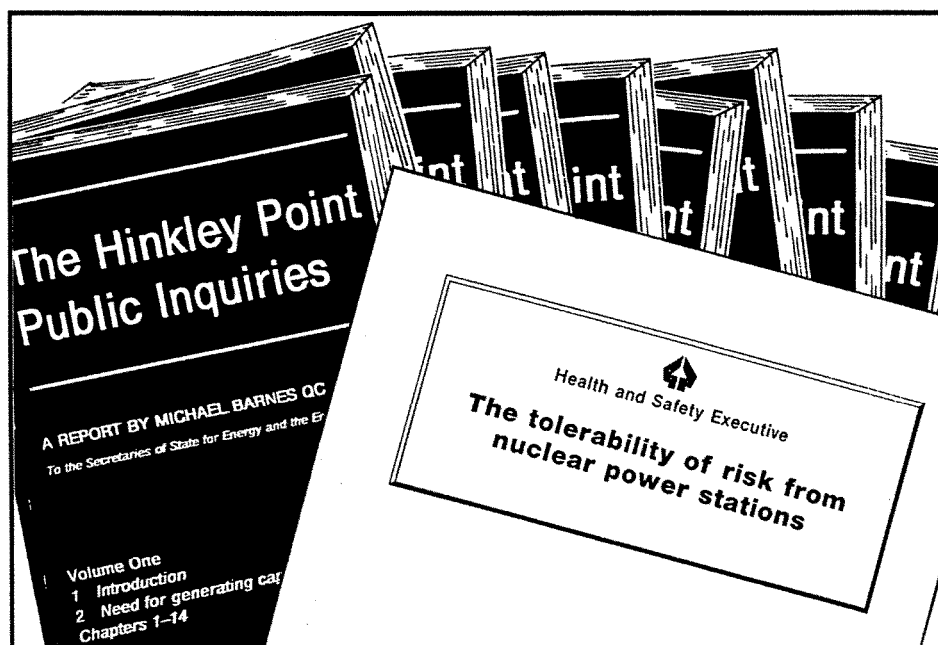
Existing nuclear stations

In an ironic twist, the Consortium of Opposing Local Authorities (COLA) which fought the Hinkley Point Public Inquiry has recently applied the Inspector's four stage process for assessing the tolerability of societal risk to Britain's existing nuclear power stations. This produces the interesting result that the risk to society from the Magnox and AGR stations is almost two orders of magnitude greater than a proposed maximum tolerable level.

COLA's analysis is contained in a memorandum submitted to both the Trade and Industry Committee and Government inquiries into energy policy and the market for coal. On the basis of the conclusion that the risk from existing nuclear power stations is clearly intolerable, COLA argue that there is a strong case for closing down nuclear power stations to create a larger market for coal. It remains to be seen how the inquiries handle this argument. □

References

- (1) "The tolerability of risk from nuclear power stations", Health and Safety Executive, HMSO, October 1988.
- (2) "The tolerability of risk from nuclear power stations", Health and Safety Executive, HMSO, October 1992.



The global environmental benefits of wind power are not always appreciated at a local level when individual schemes are proposed. Cllr STEVE MARTIN, Chair of the General Purposes Committee of Todmorden Town Council and former SCRAM journal editor, relates the progress of a wind farm project in the south Pennines.

Wind on the moors

LITTLE did I imagine, when I moved on from SCRAM after years of campaigning for a sane and sustainable energy strategy based on renewables and energy efficiency, that I would witness the beginning of that strategy being implemented on my own doorstep. But that's precisely what is happening in the southern Pennines where I now live.

By the time you read this the final commissioning phase will be well under way for the Coal Clough wind farm, the notorious wild weather allowing. And the 24 turbines should be officially handed over to Wind Resources Ltd, a consortium of Manweb, Norweb, SWEB and Renewable Energy Systems Ltd (RES), in early February, to begin their task of generating sufficient electricity to meet the average demand of 7,500 households.

It hasn't been plain sailing for the project: there were vociferous objections, and there is still a body of opinion which opposes the use of our moors for wind farms. There is, however, a growing body of supporters for this pioneering energy development. A review of the planning process leading to the successful realisation of the project may prove helpful for others.

In April 1991, RES (a member of the McAlpine group) submitted an application to Burnley Borough Council to erect 24 wind turbines, to install an electricity sub-station and connections to the local grid, and to carry out associated works. A period of consultation then ensued.

Opposition

A vocal opposition to the project grew, comprising amenity bodies such as the South Pennine Association and the South Pennine Packhorse Trails, the Standing Conference of South Pennine Authorities (SCOSPA), and the Conservative MP for neighbouring Calder Valley, (now Sir) Donald Thompson.

In May, Cliviger Parish Council, in whose area the development was proposed, decided to object, and sought support for its stance from surrounding Parish Councils. Its reasons for objection included that the site would be "an eyesore, visible from miles around" and that it would emit too

much noise and ruin an area designated as one of outstanding natural beauty.

Which is where I became aware of the proposal: early that month I had been elected to Todmorden Town Council, and Cliviger's request appeared on the 12 June agenda of the Development Committee. Due to the lack of information in the letter we couldn't make a decision, and sought further details. Unfortunately, the deadline for comments had passed by the time the item came before the Committee again.

Although the Town Council had missed the opportunity of taking part in the consultation, members were broadly sympathetic to wind power: one of my (Conservative) colleagues, Cllr Stanley Hollows, said "I cannot see anything wrong with harnessing the wind. This seems to be a very sensible idea." And the issue prompted an ongoing discussion of policy for protecting the moorlands surrounding the town. Ironically, the final article of that policy was only decided in November 1992 — control of wind power development.

Refusal

Hebden Royd Town Council and Calderdale Metropolitan Borough Council supported the development. Nevertheless, Burnley Borough Council, the relevant planning authority, turned down the application on 25 September 1991 after consultation with SCOSPA. Sir Donald Thompson applauded the decision and commented "No-one is against wind power. But people are against, and should not have to suffer, prominent scars on the landscape." Sir Donald is a paid Parliamentary consultant for British Nuclear Forum.

Undaunted, RES entered into discussions with planning officers and revised the application to take into account the Council's concerns. The Council referred the new application to the Department of the Environment (DoE), but Environment Secretary Michael Howard decided to leave the decision to the local council. Under-Secretary of State, Tony Baldry explained: "We consider the issues are essentially of local significance, and should be left in the hands of the local planning authority." Draft planning

guidance for renewable energy installations was issued for consultation by the DoE in December 1991 — there is no indication yet when the final guidance is to be published: until it is, planning authorities are working in a policy vacuum.

Following negotiations between the developer and council planning officers, Burnley Borough Council voted to give the revised application the go-ahead in June. Planning officers had also met with Cliviger Council and managed to allay members' fears. Burnley councillor David Heginbotham displayed an enlightened attitude: "The project is an experiment and one that needs to be carried out, because if things had not been tried and tested before then we wouldn't have the benefit of today's lifestyle. If a sacrifice has to be made then this council has to make it, and should lead from the front."

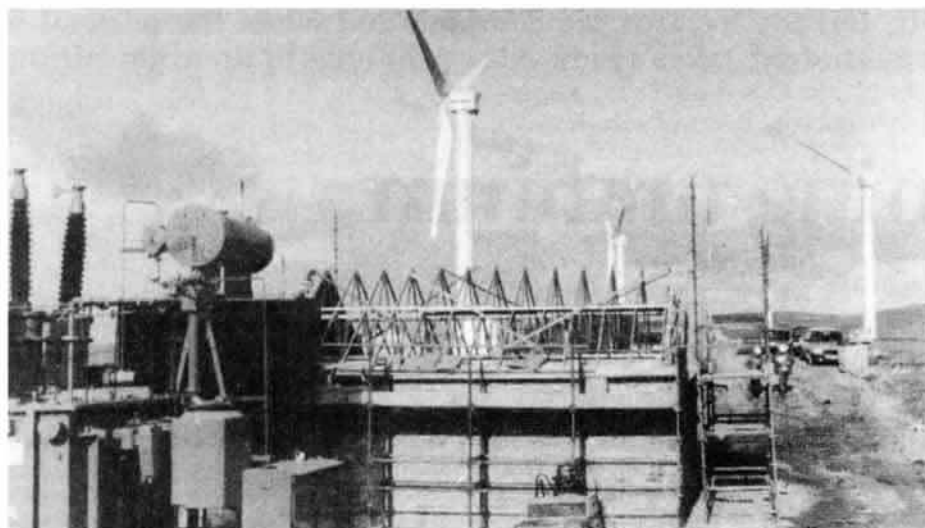
Go-ahead

Construction work began on 3 August 1992. The site covers 175 acres of Coal Clough Farm alongside Long Causeway, about 5 miles along the line of the ancient route between Burnley and Halifax, at an elevation of 370m.

The wind farm has 24 Vestas Windvane-34 400kW turbines, each 34m high with 17.5m blades. Each unit weighs 46.5 tonnes and costs £400,000. The entire project is costed at £11.5 million and should generate 9.6MW, enough power for 7,500 households, about one third of Burnley, and slightly more than would be required for Todmorden, where I live.

Once the wind farm has been built, it should operate for 25 years, although planning permission is for only 15 years in the first instance. It is likely that permission for a further ten years operating will be sought after sufficient experience has been gained. After 25 years the site could be returned to former grazing land use, or refurbished with new turbines. And, although the turbines extend over 175 acres, less than 1% of this land is actually used, with the rest continuing to be used for grazing sheep.

Two footpaths cross the site, and these rights of way will remain open throughout the site's operation. In fact,



increased tourist use of these footpaths has been observed during the construction phase, and it is believed that this will further increase when the rotors begin spinning.

I visited the site twice in October, once with the local Greenpeace Support Group, and once with fellow members of the Town Council's Development Committee on a fact finding trip to help us in our deliberations on the issue. I have to admit that the turbines are not easily hidden! Indeed, Chris Stevens, RES Construction Manager on site, remarked that, "if we could hide the towers they wouldn't be able to do their job."

The scale of the project is impressive. The construction phase is expected to last four months, with a further two months of commissioning and testing. This makes a total of 22 months from planning application to electricity generation, and this could have been reduced to under a year if the first application had not needed to be revised to fit local concerns.

Much of the work period was taken up by civil engineering: 132,000 tonnes of local stone were brought on site to make the service roads, site drainage had to be improved before heavy plant could begin work, and underground cabling had to be laid. Each tower takes only half a day to erect, with a further half day needed to attach the three rotor blades.

It is intended that the scars of new roads will quickly blend into the landscape as the local stone begins to grass over: there are already a network of footpaths and tracks criss-crossing the moors, and the dry stone walls are made of the same materials. The small areas directly under the towers will also be grassed over by the farmer, and soon his sheep may safely graze right up to the tower foot.

In an attempt to screen the sub-station which ups the voltage to feed power into the 132kV local grid, a barn has been built of second hand local stone.

The barn contains some of the computerised control equipment for the site. As a neat gesture, slits have been made in the eaves to allow bats to nest in the roof of the building. The spoil removed from the hollow in which the sub-station is located has been piled up to add extra screening, on the advice of planning officers, and will eventually be grassed over.

The entire site is self-controlling, and is in constant contact with RES headquarters in Hemel Hempstead, Hertfordshire by two-way modem: no staff will be on site. In the base of each tower there is a computer which controls the operation of the rotor and turbine: wind speed and direction information is fed from a single anemometer mast on site to each computer. The average wind speed on site is 8.5 m/s, and the turbines can operate from 5 m/s up to 25 m/s, at which speed they automatically shut down; they can also be shut down by remote from Headquarters if necessary.

Competitive

As the machinery is under warranty as part of the contract with Vestas, the Danish turbine supplier, there is expected to be no maintenance costs for at least the first five years. This, coupled with the drastically reduced profit margins associated with the current recession in the construction industry, means that the out-turn cost of the project is extremely competitive. However, due to the highly technical nature of much of the work on site, and the usual practice of big contractors like McAlpine using their own workforce, little local employment has been generated.

One local gainer will be the farmer whose land lies beneath the wind which is being harvested. Although the precise sums are confidential, a regular rent is being paid for use of merely 1% of the 175 acre site, while his sheep continue to graze. This should be a very welcome windfall to offset the extremely arduous and

increasingly uneconomic way of life which is the lot of the Pennine hill farmer much romanticised by television drama.

An interesting development emerged towards the end of site work. The original intention was to remove the construction camp and make good the land: local planning engineers have requested that a car park be created to take pressure off the narrow upland road where sightseers have already started to park. And a small refreshments franchise may be allowed — added income for the farmer.

However, some people are still against the development, and would like the moors to remain uncluttered and in their natural state for the quiet enjoyment of hillwalkers. What many people don't appreciate is that this landscape is not natural. Over the past two hundred years the area was extensively worked for minerals — it is called Coal Clough after all — and the distinctive rounded forms of grassed over coal and limestone spoil heaps, resulting from extensive drift mining, can clearly be seen. And many hundreds of years before that trees were felled for firewood; and the introduction of sheep ensured the forests would not return.

We have to come to terms with where we are going. Continuous burning of fossil fuels — coal or gas — without significant investment on the demand side and increased efficiency is the road to irreversible climate change and environmental damage; and nuclear generation is Pandora's box, a Faustian bargain from which we cannot possibly gain.

With the progress achieved over recent years to reduce some of the more objective problems of wind generation technology — reducing noise and electromagnetic interference, and increasing reliability — and the sensitive planning approach achieved through discussion and negotiation, the only remaining objection is the purely subjective one of visual amenity. I for one am willing to ignore this aspect in favour of a sustainable energy strategy — after all, electricity pylons have been striding across our hillsides for decades.

Coal Clough is the largest wind farm so far built in this country (there are two smaller ones in Cornwall), another similar scale one is to be erected on Ovenden Moor north of Halifax, about 15 miles to the west, and a 100 turbine project is planned for mid north Wales. And many local farmers are now submitting applications for small single turbines to power their farms. This is the way forward — I hope it's not too late. □

Mining is never a benign activity, but the hazards are compounded when the mineral is uranium. PENNY BOYLE, a geology student, takes a look at the problems of uranium mining around the world.

Mining uranium

MINING is the second most important human activity on the planet, agriculture being first. Whether it be the flints dug from Grimes Graves or platinum mined in South America for catalytic converters, *Homo sapiens* has always exploited minerals. Today they are frequently the only resource a third world country has to build up a long term economic infrastructure. (Therefore, the anti-nuclear movement should consider the knock on effect that success may have on Namibia, mostly stripped of good diamonds, whose main remaining economic resource is uranium.) This doesn't apply just to the developing world — the Shetland Isles Council, for example, is investing a lot of its oil money in renewable industries: fish farms, knitwear companies, tourism etc for when the oil runs out.

Mining is a destructive activity. There is the mine itself, either underground with consequent risk to the workforce, or an open pit. Both leave their own distinctive mark on the landscape with spoil heaps built from the overburden, and in the case of open cast, the hole itself. It is perfectly possible for the mine to be back-filled as an area is worked out and this routinely happens with opencast coal mines but not usually with deep mines, leading to tragedies such as Aberfan. The preliminary processing of the ore, its initial liberation from the gangue or valueless material, happens at the mine site. This is probably the stage with the greatest potential for environmental destruction.

Almost all minerals processing uses vast quantities of water which becomes very contaminated and which may be discharged into natural water courses with little or no settlement of suspended solids having occurred. Alternatively the wastes are dewatered to a greater or lesser degree in tailings ponds. The water may then be reused or discharged while the tailings present a long-term problem. In Cornwall spoil heaps from tin, copper and pitchblende (a uranium ore) mining are still sterile with very poor plant growth because the contents are so toxic.

The size of either type of pit depends on the size of the economic deposit. In the developed world economies of scale

are produced with increased mechanisation, in the third world people, often children, are cheaper. Small one or two "man" mines, exploiting small deposits, are worked by those such as the *gampeiros*, who also do the initial processing, but at a terrible cost to themselves and their environment.

All these problems occur with uranium mining with what one might call optional extras. In deep uranium mines radon build-up is a constant problem. All mines have to be ventilated, uranium and many tin mines must also monitor radon levels and continuously flush the gas from the mine. The radon exhaust from the shafts may itself be a problem. Radioactive dust is a hazard too, unlike gas it is less easily flushed from the lungs and more easily transported home irradiating the whole family.

Cancer legacy

Radium Hill and Olympic Dam are deep uranium mines in Australia. Radium Hill is old and operated under what today would be considered very lax standards. It has left its workforce a legacy of cancer and early death. Today, Australian government policy permits only three uranium mines to operate. Uranium is no longer as profitable a metal to mine since the world-wide decline in the nuclear industry and few such mines can be profitable without more valuable minerals being present and/or where economies of scale can be achieved. Olympic Dam/Roxby Downs falls into this class. It is modern, very large with total workable deposits possibly as great as 32 million tonnes of copper, 1.2 million tonnes of uranium oxide, 1200 tonnes of gold and 8000 tonnes of silver but is it any safer than Radium Hill? Yes, but probably not safe enough — maximum permissible exposure levels are set at 50mSv per annum. The then (1986) Southern Australian Minister for Health was quoted (in leaked papers) saying that standards at Olympic Dam "are and will be inadequate and constitute a health risk".

Mining is by its very nature hazardous, but explosive gases are vented before they rise to dangerous levels whenever possible because the deleterious effects

are immediate and obvious. There is no excuse for a more lax response to radioactive gas. Olympic Dam is not just an Australian problem — BP is currently selling its 49% shareholding in the mine.

Radon gas is less of a problem in open pit mines such as Rössing but, without masks and proper safety precautions, miners frequently inhale fine radioactive particles which stay in the lungs — unlike radon gas. Miners often die of silicosis and other lung diseases, radiation adds lung cancer to the list.

Radon gas and dust in the mine affect only the miners and their immediate families, who could be said to have chosen to work in a risky industry, but uranium mines also affect their neighbours. Uranium mining is no less demanding of water than other forms of mineral extraction, for example Olympic Dam requires 5 million litres a day for minerals processing. Ideally dewatering will occur at a number of stages in the production of uranium yellowcake and the extracted water can be re-used but it is not so easy to remove radioactive contamination.

The poorer the miners the less of a position they are in to demand safe standards. Ignorance of true industrial risks is often one of the legacies of totalitarian regimes, whether left or right wing, as many East Europeans have learnt to their cost. While the most obvious concern to the West is that of ill-maintained reactors exploding, we should really be as worried about the levels of pollution that have resulted from mining especially when what was mined was one of the uranium ores.

It often seems as if every successful campaign in the West only succeeds by dumping the problem on the third world. We can afford to have principles that would mean starvation for them. We export the problem but not the information enabling others to be protected. If we're not to be condemned as 'Nimby' we should be more concerned of the provenance of the goods we buy. Do we really want gold or coal won at the cost of children's lives? Should campaigns not concentrate as equally on changing the process or providing an alternative industry as on ending the destruction in our backyard.

Flooding is a constant problem with mines, very few are completely dry. Without constant pumping many mines fill and eventually flood.

Dewatering is often done via tailings dams. Water is pumped from the processing plant into a dam where the waste (tailings) settles out, then the relatively clean water from above is abstracted and re-used or discharged. This is fine so long as the system works. In areas of high rainfall if the dams are overfilled with foul water the first storm may cause them to overflow or even breach the dam completely releasing water highly contaminated from the churned up sediments. Matters are even worse if no tailings dam exists and contaminated water is routinely dumped from minerals processing.

A prime example of both the above nasty scenarios is Rum Jungle, a uranium and copper mine in Australia that closed in the 60s. Initially no tailings dam was built and as mining proceeded effluent was discharge straight into then Finnis River. Construction of a dam didn't much improve matters since flood waters regularly washed the dams away. The acidity of the treatment water destroyed vegetation on the river banks and the Australian Senate Select Committee stated, in 1965, that it made "... the water unsuitable for either stock or human consumption for a distance of 20 river miles."

Clean-up costs

In 1975 it was estimated 2,300 tonnes of manganese, 1,308 tonnes of copper, 200 tonnes of zinc and 450 curies of radium had been discharged into the river with a quarter of the radium probably having reached the sea. In the last few years of operation tailings were discharged into disused open pits. Neither of the two mining companies, RTZ and CRA, contributed to the clean-up costs which were borne by the Federal Government to a tune of 23.8 Australian dollars. It is perhaps fortunate that the acidity damage indicated the equally poisonous presence of heavy metals including uranium.

Elsewhere, for example Kerala in India ("Nuclear India: a dream gone sour", *Safe Energy* 91) or what was the Eastern Bloc, people have been less lucky. Radiation, courtesy of mining and/or processing, has become a pervasive part of their lives whilst they are unaware and wonder why sickness, deformity and death has become the norm.

In Hungary, uranium mining and processing at Pecs has left a most unpleasant legacy. The two tailings ponds, each one kilometre square and containing 15 million tonnes of solid radioactive waste covered by 9 million

tonnes of liquid effluent, are drying out exposing the waste. This results in wind-borne radioactive dust contamination. The ponds are lined with alternating layers of sand and clay which was intended to be impervious, unfortunately this proved not to be the case and in 1990 contamination was found in neighbouring wells. The fifteen spoil heaps left from acid leaching are also suffering from wind erosion contaminating nearby residential areas. The "impermeable" plastic lining the bottom of the heaps is expected to degrade and become permeable in a matter of years. The mine shafts emit radon and the high grade ore is transported the few miles from mine to mill on the public highway where, of course, contamination occurs from spillage en route.

In east Germany things are no better. In Geraroneburg tailings piles cover several square kilometres and when monitored for radium 226 counts up to 8,000 becquerels per kilogram were found. Tailings often reach villages and farmland while rainfall percolating through the tailings is contaminating groundwater. Radon is actively pumped from the mine shafts and the pipes vent on to farmland under cultivation.

It is not surprising that countries such as Namibia are reluctant to make life difficult for the mining companies because often only such multi-nationals have the resources to clean up their own mess. RTZ are responsible for the Rössing open-pit uranium mine which produces 35% (1989 figures) of Namibia's export earnings. It is a relatively low grade ore (between 0.03 and 0.05%) and is only economic because of mechanisation and cheap labour. Rössing is in the desert and evaporation is a problem with the tailings dam, creating a dust-borne radioactive hazard. The tailings operation also manages to contaminate

the river Khar. The mine's huge demand for water (reduced to 21,223 cubic metres a day) is lowering the water table creating a problem for years to come. Only RTZ has the funds to rehabilitate this site and compensate workers for indus trial disease. The Namibian Government cannot afford to make them an enemy.

Mines are holes in the ground, to state the obvious, and often fairly poorly indicated on maps. So when abandoned they are a silent lurking hazard, a minefield in fact, likely to cause subsidence at any time in the future. Again, in the UK it is difficult to force those responsible (other than British Coal) to make matters safe, so how does the developing world? In the past Cornwall and Canada mine tailings have been used as construction materials. In Cornwall this has produced 'mundic' blocks where the acidity has eaten the building block away from the inside leading to complete wall collapse. In Canada the tailings were from uranium mining leading to 80% of the houses in one township being deemed uninhabitable. Similar hazards lie in wait wherever mining has taken place without proper forethought.

I end this article with a frank, if somewhat embarrassed, confession — I own shares in a uranium mine! This is no long-hidden, guilty secret, I haven't been 'outed' by SCRAM, I learnt the dreadful truth while researching this article. Until I read *The Gulliver file* I owned my Butte Mining shares in blissful ignorance. Now I know better and whilst I still gloat over my Gold and Antimony interests the guilt is off the gingerbread and replaced by guilt. □

* This article was written with the aid of "The Gulliver file" by Roger Moody, Minewatch, 1992 (Available from Minewatch, 218 Liverpool Road, London N1, £25) and "Shut Them Down", both invaluable reference books.



Rössing Mine, Namibia

There has been much international talk about greenhouse gases, global warming and climate change, action has been less forthcoming. PAUL GILL, a graduate in environmental technology, details recent events.

Climate change convention

IN June the much publicised United Nations Conference on Environment and Development (UNCED) led to the formulation of the UN Framework Convention on Climate Change (FCCC). The Convention attracted the signature of 155 states and the European Community, however it had to be significantly weakened before the US could be persuaded to add their 'John Hancock'. However, the oil and forestry lobbies were active behind the scenes, and as a result Saudi Arabia, Iran and Malaysia did not sign.

The Convention recognises the reality of climate change and aims to "achieve stabilisation of greenhouse gases at a level that would prevent dangerous anthropogenic interference with the climate system". Parties to the Convention are obliged to formulate, implement, publish and regularly update comparable country-based reports on emissions and their net contribution to climate change, possible removal by sinks and their enhancement.

Doing little to control worldwide greenhouse gas (GHG) emissions, the FCCC has met widespread non-governmental organisation (NGO) criticism. There are no specific commitments for funds and technologies to be transferred to the developing world, although a Global Environment Facility (GEF) will dispense limited funds to developing countries for producing national reports. It also aims to meet the incremental costs of GHG control by developing countries, but remains fully under the control of developed nations.

The failure to set binding targets for emission reductions is the FCCC's most disappointing feature. It merely commits signatories from the developed world to aim to return individually or jointly to 1990 emission levels, ideally by 2000. It does not set out required sub-targets or a timetable, yet the scientific consensus on the requirements for GHG stabilisation at levels and within time frames tolerable to the adaptive capacity of ecosystems and societies, demands deep cuts in emissions. In the case of carbon dioxide (CO₂), to achieve stabilisation at current levels, emission cuts of 60% are immediately necessary.

To understand why the FCCC has failed to set the required emission targets, it is necessary to consider the 16 months of negotiations leading up to UNCED. It has been reasoned that international climate agreements "should not be too ambitious, and, at least in the beginning, should err on the side of realism. Thus, it would be better to have few but relatively uncontroversial obligations, and put contentious items into the code for adjustment later as the corpus of international understanding of the issues grows."

Recognising the sheer breadth and complexity of the greenhouse effect, Michael Grubb, of the Royal Institute of International Affairs' Energy and Environmental Programme, argues that the first step must be a framework convention to establish international monitoring and research coordination and to identify the nature of scientific and political problems. He believes that the incorporation of binding targets into subsequent protocols will cause difficulties, through honesty and equity conflicts. Leasable or tradable quotas, carbon and energy taxes were seen as the most likely policy tools to succeed in the negotiation of protocols.

Disappointing

There are, however, good reasons to be disappointed with the FCCC's failure to set any targets and firm commitments. The Intergovernmental Panel on Climate Change (IPCC) had already performed many of the framework functions, such as information exchange and research coordination; most of the developed countries had previously made national, or international commitments to stabilise their CO₂ emissions; and "no regrets" options to achieve significant CO₂ reductions at little or no cost were well known before UNCED.

Just before the 1990 Geneva World Climate Conference, the Council of European Environment Ministers agreed to jointly reduce CO₂ emissions to 1990 levels by 2000. This could have been met through existing planned programmes. However, cutbacks in the energy standards (SAVE) and renewable energy (ALTENER) programmes have diminished the scope for action, but the European Commission's proposed

carbon/energy tax could still achieve this modest goal ("A taxing solution", *Safe Energy* 85).

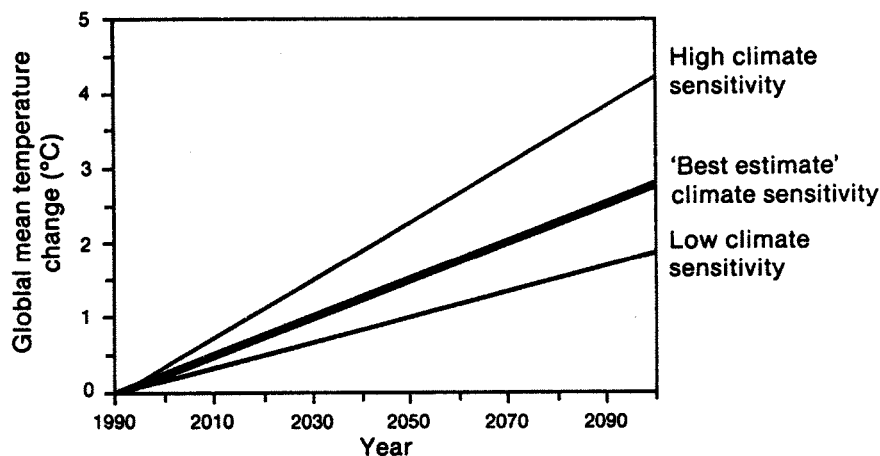
At the Geneva Conference, ministers from 66 nations had urged that prior to UNCED developed countries should formulate programmes, strategies and/or targets for GHG emission reductions. By UNCED the IPCC had collected sufficient information about the role of CO₂ in global warming to have set an initial CO₂ reduction target. The IPCC's two Scientific Assessments present consensus for immediate action. Had an overall stabilisation goal been incorporated into FCCC, then negotiations on national targets could have promptly followed the publication of the first round of national strategies.

The FCCC requires ratification through domestic legislation, and only comes into force 90 days after the fiftieth ratification. It may therefore be 1996, though probably 1995, before the signatories meet at a Conference of Parties.

A draft UK strategy will probably appear as part of the Sustainability Plan in the Third Annual Report of Our Common Inheritance in September 1993. After UNCED, the UK Prime Minister and other European Community heads of government agreed to the publication of their strategies before 1994.

The IPCC indicated that without GHG cuts then temperature increase would range between 0.2 and 0.5°C per decade. Two studies have addressed the question of tolerable limits to climate change. Both emphasise the importance of the rate of climatic change. The International Project for Sustainable Energy Paths concluded that, on the basis of forests' abilities to migrate, the warming rate should be reduced to 0.1°C/decade. The Advisory Group on GHGs concluded that to allow ecosystems to adapt, secure world food supplies and establish sustainable development the tolerable limits to temperature increase are 0.1°C per decade, and 1°C overall.

Both studies suggested that there are critical thresholds for atmospheric GHG concentrations beyond which discontinuities and positive feedbacks may occur. If the magnitude of temperature increase exceeds 1.5°C



Global temperature change (scenario IS92a), IPCC

there is a risk of triggering positive feedbacks, such as the release of methane from permafrost. Global warming is expected to be greater in polar regions and a 0.3°C increase in temperature per decade could release additional CO₂ over 60 years equivalent to 19% of unabated fossil fuel combustion.

Whether such feedbacks occur depends in part upon how sensitive climate is to GHGs. Since atmospheric concentrations of GHGs respond slowly to changes in emissions of the longer-lived GHGs, and given the magnitude of time-lags in ocean temperature response, it is necessary to take action in anticipation of proof. The use of the precautionary principle is qualified in the FCCC by having to be cost-effective.

The FCCC specified that the costs of producing a GHG inventory and emission reduction strategy by less developed countries will be met by the GEF. Funds committed to GEF are purely in relation to demands likely to be placed upon it under FCCC. The FCCC requires Parties to the Convention to make "equitable and appropriate contributions".

A proposal for a worldwide compensation plan for climate change victims through an international insurance fund has been taken up under Article 4 of FCCC. The aim is to compensate the economies most vulnerable to sea-level rise and cyclones, such as Papua New Guinea and some of the Association of Small Island States.

Joint implementation programmes would permit industrialised countries to increase their CO₂ emissions by funding emission reductions or forest planting in other areas. The term "respective capability" in FCCC permits one country to offset its CO₂ emissions by investing in emission reduction or afforestation in another country. The destruction of forests in industrialised countries led Malaysia to suggest during FCCC negotiations, a threshold of 30% for the retention of

original forest cover, up to which all developed countries should be obliged to plant, and down to which Malaysia and others could deforest.

A comprehensive approach to limiting global warming would seek to balance the budgets, or match the sources and sinks, for each GHG. If this is adopted after atmospheric concentrations of GHGs have been brought down below the thresholds of potential damage, then sustainability should follow.

There is a conflict between the stabilisation of all individual GHGs, and the mechanism for obtaining CO₂ reduction credits set out in the FCCC. Atmospheric imbalances will result from increases in emissions or concentrations of one GHG made in exchange for reducing those of another.

Balancing act

The US has proposed that all sources and sinks of GHGs be included, under which carbon dioxide credits may be obtained for policies enhancing carbon sinks and reducing sources other than CO₂ and CFCs. US lobbying for the comprehensive approach is partly aimed at claiming CO₂ reduction credits for taking action on climate by reducing chlorofluorocarbons (CFCs). However, under the FCCC such credits can only be obtained for reductions in GHGs other than CO₂ and CFCs. The finding that the reduction in radiative forcing due to ozone depletion in the lower stratosphere by CFCs approximately balances "on a global scale and over the last decade" the radiative forcing of CFCs in any case diminishes the role of CFCs in climate change. However the act of balancing ozone and CFC greenhouse effects may ignore geographical differences in action.

The conclusion that CFCs have a Global Warming Potential (GWP) of zero relative to CO₂ is wrong and in the case of some Hydrofluorocarbons (HFCs) and Hydrochlorofluorocarbons (HCFCs) estimates of GWP have increased because

of revised estimates of their lifetimes (eg HCFC-22 from 1500 to 1600 years). This is significant since CO₂ reduction credits may be obtained for reducing emissions of HCFCs and HFCs.

By forcing energy prices to reflect the risks of climate change, carbon taxes can create economic incentives to use less carbon-intensive fuels and products and should encourage innovative technological change. Although nuclear power would probably not be subject to carbon taxation, the full nuclear chain emissions of CO₂ and methane produced through nuclear generation of electricity exceed those attributable to efficient combined heat and power stations fired by gas. Over 80% of these CO₂ emissions arise through the energy related costs of fuel enrichment and reprocessing.

Were there to be a substantial expansion of nuclear power, limited uranium reserves would soon result in more CO₂ being released from dealing with nuclear fuel than from the direct use of fossil fuels to produce electricity ("The nuclear industry's CO₂ myth", *Safe Energy* 80). A full cycle assessment or "cradle to grave" approach would require companies to include waste production and raw material suppliers' CO₂ emissions in their environmental audits. If adopted it would raise interesting questions as to the correct location for carbon/energy taxes.

Because of the lack of price-responsiveness in the oil market, the level of carbon taxes would have to be relatively high to achieve significant emission reductions. Business generally resists unilateral action to avoid competitive disadvantage, and under European Commission proposals firms competing with non-European Community neighbours would be exempt. This could also present problems if carbon taxes are incorporated into future FCCC protocols since Article 4 (6) of FCCC allows for discretion to be applied to economies in transition, especially in Central and Eastern Europe.

The fate of carbon and energy taxation revenue is not clear. The US proposal for global collection to augment the GEF is logistically infeasible. National and multinational schemes are more realistic but may be oriented towards fiscal neutrality rather than reducing emissions. However if other tax reductions are linked to energy efficiency, fiscal neutrality may not be easy to achieve.

If a global level for permissible GHG emissions could be agreed upon it could be subdivided into permits to emit GHGs, allocated to individual nations but tradable with other nations, ideally

for a fixed time period only and in return for clean technology. Whether on a modified per-capita basis or not, this will present major challenges in the negotiations of FCCC protocols. Such a system could provide an economic incentive to exploit cheaper emission reduction measures earlier, and if abatement costs are lower in one country than another, then the leasing of surplus permits from a country with higher costs will lower the total cost of a given emission reduction.

Permits require accurate measurement, monitoring and record keeping, which is unlikely to be possible in most countries. International inspectors would therefore be required, and disclosures and consequent public pressures would have to be relied upon to ensure compliance. Developing countries would oppose a scheme which allowed industrialised countries to buy up spare permits, so transfer for limited periods of time may be more politically acceptable. Such leasable permits would protect developing country interests while giving industrialised countries time to reduce their CO₂ emissions below the permitted level.

Allocation

Obviously the critical question is how to initially allocate targets among nations. Developing countries may not accept permits which could restrict their full industrialisation. Equally, industrialised countries might not accept permits below their current emission levels.

The European Community is important because of its collective responsibility for extensive GHG emissions, because some individual member states have set ambitious reduction targets, and because the scope for European Community-level action is considerable and such action may encourage similar joint initiatives elsewhere.

Climate change presents a unique challenge to policymakers since so many departmental interests are involved. In the European Commission Directorates-General's (DG) pecking order even DG XVII (Energy) carries more weight than the DG XI (Environment). This is likely to be challenged by the 5th Environmental Programme, entitled "Towards Sustainability", but the lack of policy integration from the European Commission to date is likely to continue for some time.

The introduction of an energy component into European Commission carbon tax proposals aims to discourage a shift to nuclear power "with its different set of environmental problems". A European Community carbon/energy tax would probably set different targets with Germany, France, Denmark and the

Benelux countries carrying along the southern countries, Ireland and, to a lesser extent, the UK, as occurred with the Large Combustion Plant Directive.

The direct regulatory approach favoured by the European Commission makes the adoption of market-based policies such as tradable permits less likely than strict quotas and taxes. Nevertheless, much will probably be left to individual member states to decide in terms of policy choices. The Montreal Protocol was unusual in that the European Community negotiated on members' behalf for reduction targets, while individual states acted on technology transfer.

Within the UK's highly centralised government there is remarkably little integration of policymaking. Whitehall does not like to think about the long term, and prefers to displace tensions rather than address their substance. An ambitious strategy could deliver at least a 1% annual decrease in GHG emissions.

The Treasury, with particular responsibility for carbon taxation, would be a major player in the delivery of such a reduction strategy. The Department of the Environment must provide real support for energy efficiency, the Department of Trade and Industry for renewables and the Department of Transport for public transport. The forthcoming Department of Environment consultation paper on climate change policy options should give some clues as to the likely offerings from Whitehall, and will test public opinion.

Social anxieties about nuclear power and fossil fuel combustion have long been the source of grass-roots support for NGOs. The challenge is for northern NGOs to empathise and link up with their less well resourced southern partners to address equity issues and campaign for the redistribution of the world's resources. These were definitely not issues in the early 1970s when many environmental NGOs were founded, and when success partly lay in self-interest on the part of northern consumers.

Having traditionally focused on social and political aspects of environmental issues, as well as the underlying physical causes, a NGO contribution to negotiations and policy formulation is essential. In their absence policymakers may ignore precaution and cling to notions of scientific certainty. A new role for NGOs, brought in by businesses to discuss environmental auditing, is also emerging. This may be seen as an extension of their participation in government policymaking through evidence presented to Select Committees and Public Inquiries, but must not diminish their role in agitating for the adoption of radical targets.

The greatest need for GHG emission control lies in the excessive growth of the transport sector. Such runaway development can only be limited by a coordinated policy including changes in fuel economy, prompted by market and regulatory measures; switches to use of rail rather than road transport, both for passengers and goods; and the introduction of realistic charges for fuel and road use. Ultimately, the success of these measures will depend upon changes in personal lifestyles and land use policies.

CBI support

The Confederation of British Industry (CBI) believes that its members could cut CO₂ emissions by 30% by good housekeeping and investments in energy efficiency which would pay for themselves within 5 years. With its Business and Industry Commitment to the Environment programme and its Environment Committee, the CBI has long been vocal on energy issues. In 1988 it submitted evidence to the House of Lords Select Committee on Science & Technology on the Greenhouse Effect which strongly urged investment in energy efficiency, CO₂ abatement equipment, combined cycle gas turbines and CHP through tax relief or grant aid.

Perhaps the most progressive industry in terms of responses to the threat of climate change has been the \$1 trillion insurance lobby. Some companies reduced their cover in Florida after Hurricane Hugo in 1989, and saved billions of dollars by avoiding Hurricane Andrew claims at the end of September 1992. Catastrophe losses to the insurance industry, currently running at \$20 billion a year, may escalate to \$100 billion unless changes in cover are offered. This will have knock-on effects in other industries, and may successfully challenge the overriding influence of the oil lobby.

It is not obvious how the UK government will deliver GHG reductions. Its traditionally reactive policies, delaying tactics, preference for a voluntary approach, negligible grasp of the Precautionary Principle, and hopelessly non-integrated policy and regulatory institutions, argue against the UK being capable of putting ambitious precautionary policies into effect. Policy analysis must address not only central government, industry and NGOs, but also local government and individuals, both as voters and as consumers. Pressure from individuals may be the only way to set realistic targets for the protection of the earth's climate. □

"Climate change: policy, impacts and sustainable solutions" a paper by Paul Gill is available from SCRAM, at £3.00 (plus 30p p&p).

Energy efficiency campaigns come, and energy efficiency campaigns go, but government departments' consumption of energy just keeps on growing. ANDEW WARREN, Director of the Association for the Conservation of Energy, reports on the sorry state of Whitehall's energy saving efforts.

Whitehall energy farce

THIS is the tale of an 18% increase on energy bills in one year. It is also a tale of invisible Whitehall offices.

It is exactly two years since the government set up its Ministerial Group on Energy Efficiency. Chaired by the then energy secretary, John Wakeham, it consisted of ministers drawn from every government department, each with a "special responsibility for the promotion of energy efficiency."

Eighteen months later the Department of Energy was closed down. And the Ministerial Group was abandoned, its work being subsumed into the all-purpose Green Ministers' Group.

During its existence, the special energy efficiency group produced but one publication, an annual report for 1990-91. Although it did not conclude its existence until after the end of the financial year 1991-92, it seems that a second annual report is not to be forthcoming.

That is a pity. For it might have provided some explanation as to precisely why its main original pledge to reduce Whitehall's own energy bills, has gone so woefully astray.

With much fanfare, the commitment was made. As the annual report stated, the key objective would be "to set an example in Government through the development of policy initiatives, and by taking forward the Energy Efficiency campaign on the Government Estate."

The target would be to provide "annual fuel savings rising to 15% over the five years from 1990-91 to 1995-96." And the line of responsibility was clear: "Ministers on the Group will regularly monitor their Department's progress in improving energy efficiency performance and are responsible for ensuring that the 15% saving target is achieved" (emphasis added).

In this unique annual report, a detailed table was included. Department by department, it gave figures for expenditure on energy, levels of investment in energy efficiency (all down to the exact £), and expenditure per square metre.

Last month the Government published "This common inheritance: the second

year report". This was — as the title suggests — a follow-up to the famous 1990 environment white paper much trumpeted by the then prime minister, Margaret Thatcher. The new white paper provides details of all the 'green' actions that have been taken.

It also has a table, which covers just the same information on energy expenditure — overall spending, efficiency investment budgets, and spending per square metre — as had the Ministerial Group's annual report.

It was the overall figures that alerted us to the fact that all is not well. In 1990-91, total expenditure on fuel had been £288.77 million. In 1990-92, it was £341.47 million. This is an increase of £52.7 million, or 18%. Fuel prices in commercial buildings certainly did increase over this period — but by nothing like that much.

Profligate

Some departments have done better than others. Indeed, three (environment, health and Northern Ireland) had actually decreased their energy spending. But the other twenty one had shown an increase, sixteen of these by over 10%. Amongst the largest increases were Customs and Excise (up 68%), foreign office (up 54%), education (up 48%) and transport (up 40%). The Ministry of Defence alone increased its spending on energy by almost £40 million.

But perhaps there was greater comfort to be found for the future. Perhaps all these profligate departments had been investing in energy conservation measures, to cut future budgets? No such luck. Reported expenditure on energy saving dropped from £20.4 million to £13.1 million, a drop of 35%. However, as two ministries were unable to provide energy efficiency expenditure figures (Defence and, unbelievably, Energy are the culprits), these figures are inevitably a little misleading. Certainly some departments have increased spending dramatically, but others have dropped substantially. Health is down 96%, DTI down 74%, Welsh Office down 34% — and the Treasury plummeted to zero expenditure. During the entire 12 months, the Treasury — the one

department supposed to understand the concept of investing to save — spent not one penny on energy saving.

More pertinently, practically no departments followed the Audit Commission's rule-of-thumb: allocate a sum equal to 10% of energy bills for energy efficiency measures. Only five out of twenty-four hit this target. The average spent was just 3%.

As the white paper conceded, "aggregate progress has so far been limited". However, it did seem as though one set of statistics — that for energy expenditure per square metre — had increased only a little. Overall, it was up from £9.49 to £9.63 per square metre, just 1.5%. Many departments claimed to have reversed that trend, with their 'performance ratio' actually improving.

But how could this be, when there had been an overall 18% increase in spending? There could be only one answer. The relevant departments are now occupying far more office space than before. By dividing the cost per square metre into total expenditure, it is possible to establish just how much room is being used.

In the Treasury's case, the sums worked out at 29,860m² in 1990-91 and 42,808m² in 1991-92, an increase in floor space of 43%. The Department of Transport, by the same token, leapt from 287,525m² to 372,515m² a 30% increase. An apparently, there was a 7% increase in prison space, as Home Office (prisons) leapt from 2,164,435m² to 2,324,479m²: enough to thrill the lock 'em-all-up lobby.

Now, I may have missed something. Perhaps all this trumpeting about the slimming down of Whitehall is so much baloney. Perhaps civil servants have secretly expanded their office space by these enormous amounts.

But perhaps the truth is that, despite all the years of Secretaries of State calling for new energy efficiency drives, Whitehall still does not have a clue about the costs of its own buildings. And if that is the case — as I suspect it is — then it bodes ill for the success of the nation's overall energy saving campaign. □

Energy policy predicament

TRADE and Industry Secretary Michael Heseltine invoked a classic political ploy in announcing a review to stave off the furore over pit closures ("Coal chaos", *Safe Energy* 91). However, he must now find a solution to the energy dilemma.

The measure of his task has been highlighted by the hurriedly arranged Trade and Industry Select Committee inquiry into "British energy policy and the market for coal". There is no quick fix, and a collection of vociferous vested interests are defending their corners.

The root of the problem is the botched privatisation of the electricity industry cocked-up initially by Cecil Parkinson and salvaged at the eleventh hour by John Wakeham. Wakeham pulled off the rescue by deferring key elements of the privatisation until after the sell-off, and conveniently until he was long gone.

The most noteworthy of these sidesteps was the 1994 nuclear review, but matters of regulation, pricing and competition were also neatly postponed.

No doubt a more sensitive or shrewd political operator than Heseltine, or one with a clearer knowledge and understanding of the issues, could have dealt with the pit closures less calamitously, but the key questions being thrown up by the review were going to have to be dealt with in any case.

In evidence to the select committee, several of the major players in the electricity supply industry (esi) had strategies on offer which provided a degree of protection for British Coal, while at the same time protecting their own interests.

Vested interests

National Power (NP), the UK's largest generator, suggested that the franchise sector of the esi be reserved for British Coal. Such a plan would preserve the National Power/PowerGen duopoly of supply, via the regional electricity companies (RECs), to the largest section of the esi — households and small businesses.

Nuclear Electric (NE) argued for a "balanced fuel supply pattern" which would see coal demand falling from 54 million tonnes (Mt) to 44Mt over five years, a market share for gas increasing

from 8% to 20%, and a protected market of 22% for nuclear power.

The RECs, with the exception of Eastern Electricity, have proposed a delay in the liberalisation of the esi to allow increased coal purchases. Unlike NP's suggestion, the RECs would be free to compete in generation for the franchise market, and their monopolistic supply position would be protected. The trade-off would be a reserved place for coal, increasing demand from 40Mt to 55Mt.

Many of those giving evidence have suggested closure of NE's decrepit Magnox stations which are already well past their 'best before' date, in total they represent the equivalent of around 9Mt of coal.

The roughest ride at the select committee was given to the electricity regulator Professor Stephen Littlechild. This is somewhat bizarre given the roles of: NP and PowerGen (PG) in reducing their demand for



David Shaw

British coal by importing foreign coal; British Coal for failing to secure markets for its product and its crass handling of the pit closure plan; the RECs in their unnecessary dash to gas; and the government in its dereliction over energy policy.

The select committee felt that Littlechild ought to do something, while Littlechild believes he is carrying out his duties as laid down by Parliament. His tardiness in investigating the costs of new gas generation — probably borne from his paramount belief in increased competition — was, however, negligent. Littlechild's stance could well see him axed to allow a more interventionist approach — a government U-turn by stealth.

Front runner as Littlechild's successor is Dieter Helm, an Oxford

economist, who has argued for "a more sane approach to blending the needs of the market with the post-corporate phase" and has advocated diversification in generation as gas prices will rise while coal costs will fall.

The select committee is, meanwhile, considering proposals for the setting up of a new energy agency to help oversee strategic decision making. This could involve the merging of the electricity and gas regulators, Offer and Ofgas, with enhanced powers.

Intervention

While the select committee wends its way through the inquiry, the Department of Trade and Industry (DTI) review is now being overseen by Peter Loughhead, previously a Treasury official in the financial services division. Both investigations are due to conclude in January.

Heseltine is by nature an interventionist, and while he has little room for manoeuvre, he may be able to salvage something from the chaos. His position is helped by the slowing down of the dash to gas, with eight projects having been delayed or abandoned.

And the Office of Fair Trading has given clearance for the RECs to act in unison to sign a three-way deal with British Coal and the generators, NP and PG, though the RECs are said to be reluctant to sign any such deal in advance of Heseltine's January white paper.

Given the response to the pit closure plan, Heseltine is unlikely to reprieve coal at the expense of any single alternative. An across the board pruning of capacity seems probable, with coal remaining the prime target.

The ten pits under notice of closure look doomed — but perhaps one will be reprieved to 'authenticate' the 90 day review procedure. Further pits from the original hit list of 31 could be picked off one by one, while some method for restricting imports might be devised at least in the short-term. NE's Magnox stations could be eased out, but in such a way as not to hasten their expensive decommissioning. And the slow down in the dash to gas may be encouraged — possibly through a new cost evaluation process administered by Offer. It will be a major achievement if Heseltine can put together a package which spreads the pain sufficiently to dilute the opposition. □

UN efficiency zones

DEMONSTRATION energy efficiency zones could soon be established in central, eastern and southern Europe as part of the United Nations' Energy Efficiency 2000 project.

City-scale projects have been proposed to "stimulate enterprise and initiative in market approaches to energy efficiency". Thirteen possible projects have been identified in the former Eastern Bloc together with a housing energy efficiency scheme for Valletta, Malta.

The zones, similar to urban or regional development zones established in Western countries, could demonstrate energy-efficient technology, provide information, give financial incentives, and provide international assistance.

It is intended that successful measures would be replicated nationally once proven

on a local scale. The individual schemes vary widely, but the general approach is the recognition of the environmental and economic benefits of energy efficiency.

Four of the projects are in the Russian Federation: Vornovo State Farm; Reutov town rehabilitation project, in Moscow region; a combined heat and power plant at Tushino, District of Moscow; and Severnij new town, District of Moscow.

The state farm project, which might save 1.5 to 2GWh a year, could be applied to the 6,000 roughly analogous state farms throughout the Russian Federation and would have an impact on the scores of thousands of crop producing farms.

A project in Bratislava, Slovakia, which would include the use of renewable energy, is geared towards the provision of information, education and training. For the Ceska Lipa Region, in the neighbouring Czech republic, the main concern is in providing environmentally friendly

and energy-saving infrastructure for an area which has been devastated by years of uranium mining.

The city of Pecs in Hungary, another area affected by uranium mining, has already received support from several international organisations for environmental and energy improvements. It has plans for a wide range of energy efficiency measures including low-energy housing development and improved energy management systems in public buildings.

The 'Brundtland Town' concept where energy consumption and environmental impact are reduced to a level compatible with sustainable development is proposed for Vilnius, Lithuania in co-operation with the Danish Energy Agency and the Danish Technology Institute.

Other projects are proposed for Deva, Romania; Maribor, Slovenia; Lvov, Ukraine; and Kragujevic and Novy Sad in Serbia. □

Efficiency boost

ENERGY efficiency projects have been given a boost by electricity regulator Professor Stephen Littlechild. Following his recent report on energy efficiency ("Energy efficiency", *Safe Energy 91*), Littlechild has announced that spending on energy efficiency projects would be a legitimate business expense for regional electricity companies (RECs).

This will allow RECs to recoup their costs through the existing price control mechanism. However, it doesn't deal with the problem of increased per unit system costs which result from reduced demand

— this expense cannot at present be passed on to consumers. This has already been raised with Littlechild, and it remains to be seen whether appropriate changes will be made when the price controls are revised in April 1994. Littlechild has stated that energy efficiency issues will be taken fully into account.

The RECs are now able to invest, along with British Gas, in a new government agency, the Energy Saving Trust, which is headed by former energy minister Lord Moore. The Trust, a Conservative manifesto commitment, is a main plank of government environmental policy and aims to identify energy efficiency projects to reduce carbon dioxide emissions. □

Glasgow's more efficient

SINCE 1980 energy conservation measures have saved Glasgow District Council £5.1 million.

With a total expenditure of £2.47m since 1981, their Energy Conservation Unit (ECU) has provided substantial and continued reductions in fuel consumption and energy costs without reducing service delivery.

The energy consumption of the council's major properties has been cut by 25% with a consequent reduction in pollution. The ECU provides technical input to the Housing and General Services capital programmes, and this year's savings amount to £995,000.

Measures applied include low-cost retrofit of draughtproofing, thermal insulation, time switches, low-energy lighting, new boilers and solar heating. Houses, museums and libraries have been equipped with centralised building management systems. □

Cllrs against acid rain

AN Norwegian delegation of councillors came to Britain on 30 November to raise awareness on acid rain. The delegates, part of a lobby group called Councillors Against Acid Rain (CAAR) met with Scottish and English councillors and leading scientific experts in Aberdeen.

The seminar, hosted by Grampian Regional Council, highlighted the severe effects of acid rain on southern Norway: the lakes and rivers have no fish, the forests are dying, and in rural areas drinking water from private sources contains high levels of aluminium, a health hazard to the young and elderly.

Councillor Erik Mørch, chair of CAAR, warned delegates that "the UK is experiencing similar effects with acid rain to Norway and action should start immediately before the situation is serious."

As a result of the seminar, the North Sea Commission of the Conference of Peripheral Maritime Regions (CPMR), an international lobbying organisation of regional councils, is to bring forward proposals for councils to lobby governments and the European Commission and initiate actions themselves to lessen the effects of acid rain. These plans will be put to the General Assembly of the CPMR North Sea Commission in Scotland on 22-23 April 1993.

■ Proposals for dramatic reductions in air pollution emissions have been made in a recent report* by the Swedish NGO Secretariat on Acid Rain. The findings follow an international conference held in Göteborg, Sweden earlier in the year attended by over 20 representatives from environmental groups throughout western and eastern Europe.

The report calls for a strategy to reduce acid rain through a 90% reduction in emissions of

sulphur dioxide and oxides of nitrogen (NOx). The demand for such dramatic cuts stems from the estimate that acid deposition in over three-quarters of Europe exceeds critical loads (the maximum amount that an ecosystem can tolerate without being changed or damaged).

The seminar also called for reductions of 75% in emissions of volatile organic compounds (VOCs) and ammonia, and through the NOx and VOCs cuts a reduction of 75% in tropospheric ozone concentrations. The reductions are based on emission levels in the early 1980s.

Proposals to meet these targets include:

- using renewable energy sources;
- increasing energy conservation;
- increasing efficiency of energy production, transmission and use; and
- applying best available techniques in the energy, transport, industry and agriculture sectors. □

* "Critical loads for air pollutants", Swedish NGO Secretariat on Acid Rain, 1992.

Renewables prospects

THE long delayed report by the government's Renewable Energy Advisory Group (REAG) ("Reviews delayed", *Safe Energy 91*) is now expected to be published in the near future.

According to reports in *The Independent*, establishment influence has drowned out more sympathetic voices on the group, and a target of just 1,500MW of renewables by the year 2000 will be proposed. This compares with the government's present target of 1,000MW, which has been widely criticised as

grossly inadequate, most prominently by the Energy Select Committee which called for 3-4,000MW.

REAG, which is headed by Dr Mary Archer, was brought together in 1991 by the then Energy minister Colin Moynihan. The delay in publishing the report, originally expected in early '92, led to speculation that the government, whose interest in renewables seems to have declined since the general election in April '92, may be watering down REAG's findings.

■ A further setback to renewables is the continuing discussions between the UK government and the European

Commission (EC) over extending renewables subsidy under the Non-Fossil Fuel Obligation (NFFO) ("Renewables stalemate", *Safe Energy 91*).

The 1998 cut-off was imposed by the EC to prevent continuing subsidy of nuclear power, a developed technology, but it was always reported that, as in other countries, further subsidy of renewables would be acceptable to the EC. The failure to reach agreement has been blamed on the EC's competition directorate, but speculation is now growing that the UK government is trying to include a continuing nuclear subsidy in its plans, and that this has caused the problems with the EC. □

Dam discussions

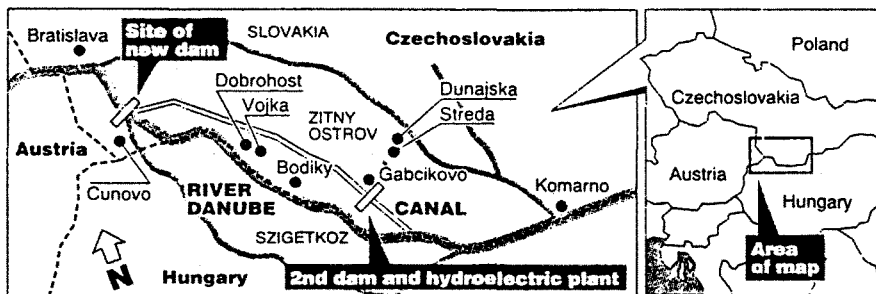
THE dispute between Hungary and Slovakia over the controversial Gabčíkovo hydroelectric dam on the Danube ("Dam near finished", *Safe Energy 91*) is to go to arbitration.

Slovakia has completed the first stage of their plan to divert the Danube at Cunovo along a specially built canal to the dam and turbines at Gabčíkovo but has agreed not to proceed further until a ruling is made. A panel of scientists from the two countries, together with European Commission experts will now investigate.

The Hungarians, originally partners in

the project, argue completion will cause further extensive environmental damage, affecting the water table and important wetlands along the Danube, while the Slovaks claim that it will be more environmentally damaging to leave the development idle.

The Slovaks, who became independent from the Czechs on 1 January 1993, have agreed that a final decision should be made by international arbiters or the Court of Justice in The Hague. The work already done by the Slovaks may be irreversible, and observers in Brussels suspect that proceeding with the project in some form may indeed be the least damaging option. □



Bio-diesel buses

READING Transport has begun a trial fuelling three of its buses on rapeseed oil instead of diesel. It is the first time a bio-fuel has been used in UK public transport.

Novamont, the fuel's Italian makers, claim it emits no sulphur dioxide, halves deposits of particulates — the heavy black smoke given off by diesel — and cuts nitrogen oxide and carbon monoxide emissions.

The fuel, known as 'bio-diesel', is already used commercially in other European countries, especially Italy where it fuels public transport in cities with air pollution problems.

Doubts have, however, been raised about the fuel's environmental benefits and long-term prospects. The abundance of rapeseed is due to European Community subsidy of the crop, mainly to produce cooking oil. And the overall environmental impact and efficiency of the fuel needs to include the energy intensive cultivation and the necessary addition of methanol to the oil. □

Chicken shit

CHICKEN power is now a reality following the official opening in November of what is claimed to be the world's first commercial power station fuelled by poultry litter.

The £25m plant at Eye, Suffolk, will generate 12.5MW of electricity from 130,000 tonnes a year of fowl litter — a mixture of wood shavings, straw and droppings.

Fibropower, the company which has built the plant, says that carbon dioxide emissions will be two-thirds less than from coal stations. Another environmental benefit is that the incinerator ash can be used as a nitrogen-free fertiliser without the

problem of methane gas emissions which result from direct use of poultry litter on fields.

The project, part of the 1990 renewables order, is the brainchild of Simon Fraser who used the process to fuel a whisky distillery from forestry clippings. Without its Non-Fossil Fuel Obligation subsidy the project would not have been economic. "But in the long term," Fraser claims, "this type of energy production is competitive with other generating methods."

Another chicken powered plant, of 13.5MW, is being built at Glanford, south Humberside by Fibrogen, a Fibropower sister company. Together they will use just under one-fifth of the 1.5 million tonnes of poultry litter produced annually in the UK. □

Waste lobby

FOUR of the UK's largest waste-to-energy companies have formed a lobby group which aims to promote the role of renewable energy sources during the government's review.

With local authorities having to contract out their waste-management functions by April '93, the lobby group believe there is a large market for generating electricity from waste. They argue that modern waste incinerators produce lower emissions than decomposing waste in landfill sites — the current disposal route for over 90% of the UK's 30m tonnes of household rubbish.

Over 20 projects are being considered in the UK, but unless they are assured a subsidy they will not be economically viable. □

Wave progress

A cautious boost was given to wave energy during a two-day European Commission conference held in Cork in October. The leading wave energy teams from all over Europe were represented and they were given a strong hint that there will be more funds available soon from Brussels for building a pilot plant — probably at Galley Head in southern Ireland, writes David Ross.

While the news of renewed support was welcomed by the researchers, many were disappointed by the small scale of the proposal. The likelihood is that the EC will hold back from the decisive step of financing a wave power plant in the open sea and continue paddling on the beach. The selected plant is expected to be a 500KW shore-line oscillating water column (OWC).

Dr Giancarlo Caratti, for the EC, insisted it was too soon to go ahead to the 1MW offshore module that is widely regarded as the logical next step.

"We are ready to have full European co-operation on an on-shore plant now," Dr Caratti said. "We need it in the water. Let us go for what is ready. But I remain completely open to an off-shore plant — as a second phase."

The conference was called by the EC in preparation for a meeting of its Council of Ministers on 10 December '92, at which decisions are expected on funding. The EC gave 1.2m ecus (about £850,000) for 1992 and pessimists fear that the next tranche will only be 2m ecus which is scarcely an advance.

The OWC may only get half of this money, and considerable additional support from the host government or utility would be required.

Many of the 45 scientists and engineers attending, who came from the UK, Ireland, Norway, Sweden, Denmark, Portugal and Spain, argued for a more adventurous approach.

Dr Martin Greenhow of Brunel University, one of the early researchers with the Salter's Duck team at Edinburgh University, said: "we have already had experiments in OWCs in Islay, Norway

and Portugal. We have got to go offshore with a floating or flexible structure, with mass produced modules."

Professor Stephen Salter took the opposing view. He argued that work in the laboratory could provide nearly everything that could be learned by going to sea at this stage.

Tom Thorpe of ETSU (the Energy Technology Support Unit at Harwell, which oversees the British programme), who has been conducting a survey for three and a half years on the British wave energy programme, said they needed to design a device with a structure which lent itself to mass production. Without revealing anything of his own conclusions, he said that Professor Michael French of Lancaster University had started along this road with his invention of the PS Frog (pitch and surge). Shaped like an upturned paddle, it uses the lateral movement of the waves. It is widely regarded as an elegant means of capturing the energy of the waves and is an outsider which could attract a lot of official support because of its likely lower costs. □

Wind planning problems

ONLY two of the 17 wind farm projects in southwest England included in the 1991 Non-Fossil Fuel Obligation (NFFO), have so far managed to receive full planning permission. The reluctance of Devon and Cornwall planning authorities is proving a major hurdle to wind power development.

Poor site choice, believes Peter Crone of Farm Energy, a Devon based wind engineering consultancy, is one reason for the authorities reluctance to give projects the go-ahead: "Many of the sites have not been terribly well chosen ... Some were considered to be sited too near villages and some very small projects proposed for sensitive areas were refused because the planning authorities felt the contribution to the National Grid did not compensate for the loss of amenity."

Cornwall does, however boast the first two commercial wind farms in the UK: at Delabole, under the 1990 NFFO; and at Carland Cross. The success of these two projects may help others over the planning hurdles.

The rush of planning applications came at a time when there were no relevant



The Carland Cross wind farm in Cornwall

policies to guide councillors through the planning issues. According to John Pender, head of development control with Kerrier District Council: "These were very innovative projects for the council to consider and at first there were no guidelines against which planning officers and the council could assess them. We now have a

better policy background — and we have since seen wind farms in operation."

The government's "Planning policy guidance note on renewable energy", issued in draft form in December 1991, was well received by renewable energy groups, and a final version is expected before the end of 1992. □

LA offshore wind

THE USA may soon see its first offshore wind farm, at a site near Los Angeles. Plans are under way to get permits for the siting of 20 to 30 500kW Vestas V39 turbines two to three miles offshore on a breakwater at Port of Los Angeles.

With air pollution being such an important issue in the area — the

smoggiest in the USA — the plan has received the preliminary backing of the local government agency responsible for air quality. Ranji George, programme supervisor in technology advancement at the South Coast Air Quality Management District (SCAQMD) said: "We have always supported wind technology but this is the first project we are seriously considering." There is the possibility that SCAQMD will give financial support to the project.

Some local residents have objected to the proposal. At a public meeting with the developers several people complained that the turbines would be noisy and ugly. Further concern has been expressed about the impact on birds. Brown pelicans and least terns nest in the area, and a study will have to be carried out to see if there would be any affect on the birds' mating, roosting and flight patterns. □

REVIEWS

Privatising British Electricity: restructuring and resistance by Andrew Holmes

Financial Times Business Information;
1992, 155pp, £280

Andrew Holmes casts his cynical and incisive eye over the electricity supply industry (esi) (predominantly of England and Wales) and looks to the future. His cynicism is well placed and his analysis revealing.

While covering similar ground to other authors, Holmes tackles the subject with fresh insight. An understanding of the political manoeuvrings together with a knowledge of the inner workings of the electricity industry combine to present a detailed overview of events.

Holmes precedes his account of the privatisation process with the pointed comment: "Now that the system is up and running, there is a temptation to look for underlying logic in the way events have moved and to invent retrospectively a

degree of calculation which was never there."

The two main characters in the story are uncompromisingly dealt with. Cecil Parkinson was incompetent and unable to face Margaret Thatcher with the truth that nuclear power could not be privatised. John Wakeham, "the arch fixer", was able to pick up the mess created by Parkinson and force through privatisation to a near-impossible timetable by cajoling and threatening the vested interests who had got the better of Parkinson. The long-term problems that his quick fixes would cause were of no concern to Wakeham.

The Scottish industry is not dealt with in any detail, but the suggestion that: "The Scots have a much less onerous contract with Scottish Nuclear than their Eng-

lish equivalents have with Nuclear Electric," does not square with the reality that Scots pay a higher per capita nuclear subsidy than do the English, albeit more cunningly disguised.

The importance of the fact that no-one is now responsible for ensuring that there is sufficient capacity is neatly put: "Essentially electricity works on the Micawber principle: demand 100MW, supply 101MW, result happiness; demand 100MW, supply 99MW, result black-outs."

Holmes digresses from the esi to consider wider environmental matters: "The imperative to protect the environment ... appears a more complicated phenomenon in the 1990's than it did a decade ago. Everyone is green now. The oil companies whose products help virtually to turn London, Tokyo and Los Angeles into gas chambers every summer, claim to be green because they sell unleaded petrol. Every section of industrial and political society has donned the green mantle, however tenuous their

claims to a good environmental record may be. Thus the public, whose anger is the only motive force for environmental change, believes that the need to protect the natural world is universally accepted and acted upon. The same public drives the vehicles which turn cities into gas chambers."

In dismissing the notion that the UK esi could offer a template for other countries he states: "Like any other system, that of the UK reflects the preoccupations, prejudices and problems of the economy that created it. In the UK's case, these include a large national coal industry, a cluster of old nuclear power stations, a manic belief in the efficacy of competition and a power-consuming public too docile to object."

And in a Conan Doyle pairing, Holmes quotes Professor Patrick Moriarty: "The price of electricity is what the government wants it to be." A timely reminder to Michael Heseltine and his energy review.

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REVIEWS

Earth in the balance: forging a new common purpose by Senator Al Gore.

Earthscan; 1992, 407pp, £14.95.

"If the world is to avoid environmental catastrophe, advanced economies must undergo profound transition" so says veteran environmental campaigner and vice-president elect of the USA Senator Al Gore.

Gore's environmental education began early. As a boy growing up on a small farm he remembers how important it was to stop "up the smallest gully before it gets started." If the gullies got out of control he tells us, then deep slashes are cut through pastures, leading to the loss of valuable and fertile top soil. Yet on neighbouring farms the formation of gullies were not checked. From this, he learnt a valuable lesson: "People who lease the land for short-term profits often don't consider the future. From fence row to fence row, they strip-mine the top soil and move on. And even if you

own the land, it's hard to compete in the short term against somebody who doesn't care about the long term."

Vietnam taught him to be "wary of all chemicals that have extraordinarily power effects on the world around us. How can we be sure that a chemical has only the powers we desire and not others we don't?" He recalls traversing through the countryside of Vietnam which following the unleashing of the herbicide Agent Orange had come to resemble the surface of the moon. At the time he was grateful for its corrosive power, and it was not until many years later after learning it was suspected of causing chromosomal damage and leaving a legacy of birth defects that he "came to feel differently about it."

As a student he was introduced to the idea of global

environmental threat when one of his professors became the first person in the world to monitor CO₂ in the atmosphere.

Gore entered Congress in 1976 and since then he has been pushing environmental issues onto the American political agenda: organising hearings on global warming in the late seventies, establishing — with the support of a few others — a Superfund Law to clean up hazardous waste sites, formulating policies for the reduction in stockpiles of nuclear weapons and pushing for improved energy efficiency.

Gore promotes a "Global Marshall Plan" based upon the post world war 2 "European Recovery Programme". His plan would involve "wealthy nations" allocating money for transferring "environmentally friendly technologies to the Third World and to help impoverished nations achieve a stable population and a new pattern of sustainable economic progress." We must, believes Gore, "negotiate international agreements that establish global constraints on acceptable

behaviour but that are entered into voluntarily — albeit with the understanding that they will contain both incentives and legally valid penalties for non-compliance."

His Global Marshall Plan, as presented in the book, presents distinct policies on population, energy, economics, treaties and agreements ... For each section, Gore also sets out what he sees as the US's role.

Here Gore has set out his vision for all to see, and it will be interesting to find out how much of it is shared by the man who will be the next president of the USA, Bill Clinton.

Self-promoting volumes emanating from American politicians are common in election years, but Gore's environmental monograph is refreshingly different. *Earth in the balance* is substantive, passionate and well written, as might be expected of the former journalist. Perhaps we can look forward to a new cliché in the Whitehouse lexicon of snappy retorts: "Read my book."

MIKE TOWNSLEY

Nuclear Power and Global Warming

A lot of money is being spent on promoting nuclear power as an environmentally-friendly energy source. Humanity can't afford to let this go unchallenged. The Centre for Alternative Technology demonstrates the real safe alternatives to fossil fuels. Our education facilities creatively bring people in touch with the planet we all depend on for our survival. Being "green" starts with a recognition that it is impossible to survive if we destroy that which keeps us alive. The Centre's purpose, then, is to promote Earth-friendly practices as well as point out the causes of today's environmental problems. You can help us in our work by joining the Alternative Technology Association.

As a visitor to the Centre, you may be inspired to change your life. As an ATA member you can actively work for change, encouraging others and leading by example. You will receive Clean Slate, the AT magazine, and have access to CAT information and education publications and facilities.

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To join contact NATTA c/o EERU, Faculty of Technology, Open University, Milton Keynes, Bucks., MK7 6AA.

LITTLE BLACK RABBIT



Trust turkey

Following a lengthy trawl, Lord John Moore was the surprise choice to head the government's new Energy Saving Trust. The official press release announcing his appointment was at pains to stress Lord Moore's credentials based on a spell he spent as an energy minister. He was, according to the press release, the moving spirit behind the National Energy Foundation, now chaired by Dr Mary Archer.

Fact No.1: Lord Moore left the Energy Department in 1981.

Fact No.2: The National Energy Foundation was established in 1988.



Statistics

Little Black Rabbit's favourite pro-nuclear magazine, Nuclear Forum, has been reporting the success story of Scottish Nuclear. In amongst a host of statistics is the information that Scottish Nuclear made a £13.7 million profit in 1991/92.

What Nuclear Forum doesn't tell its readers is that Scottish Nuclear received a £1.4 billion debt write-off and £110 million in government-underwritten provisions for Hunterston A (in addition to £270 million previously given).

Nuclear Forum also points out that Scottish Nuclear does not benefit from the

Fossil Fuel Levy. It doesn't mention the inflated contracts with Scottish Power and Scottish Hydro which pay around 3.7p per unit — contracts which were signed when the major shareholder in all three companies was the Secretary of State for Scotland.



No truck

Plans by AEA technology to send a lorry from Dounreay on a mercy mission to war-torn Bosnia have been terminated at the last minute. The truck was to have joined a charity convoy taking relief supplies to the former Yugoslav republic.

As with nuclear accidents, the problem would appear to be one of insurance — or the lack of it.



It's a gas

Dr Michael Clark, the former Chair of the Energy Select Committee, has been a powerful critic of government energy policy — or the lack of it. He now finds himself investigating energy policy on the Trade and Industry Committee whose findings could influence Michael Heseltine.

The committee will finish its inquiry in January, which will allow Clark to take up a new post as a parliamentary advisor.

And who will be paying him for his advice on how to improve their position?

British Gas — a company for which the outcome of Heseltine's energy review will have a major impact.



Repentant

"We must emphasise the future benefits of nuclear power, and also the possible consequences if nuclear power is not developed for future years." So said Edmund Wallis, manager of Oldbury Magnox power station, in 1979.

Ed Wallis has moved on since then, and is now chief executive of PowerGen. And he is now calling for an end to the £1.2 billion a year nuclear subsidy and closure of Nuclear Electric's "30-year-old, geriatric, high-cost Magnox stations."



Bleak Christmas

Lord Mason, the former Northern Ireland and Defence secretary, has sent out a novel Christmas card: a stark watercolour of a desolate coal mining landscape with a headstone bearing the message "RIP Yorkshire pits".

The card was commissioned from Yorkshire artist Ashley Jackson who has painted 25 copies of the card.

Lord Mason has sent cards to the Queen and the prime minister with a note saying there will be "sadness and despair" in mining areas this Christmas.

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