

SAFE ENERGY

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NUCLEAR WASTE

Managing the future

ENERGY DIVERSITY

**Putting eggs in
energy baskets**

RADIATION AND HEALTH

**BNFL links with
DNA study**

ENERGY FUTURE

**Solar energy for
survival**

NUCLEAR SECRECY

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COMMENT

A lot of attention has been paid recently to the government's proposal to dump low-level nuclear industry waste into local landfill sites. The question is: why has the government made such a politically naive suggestion? A suggestion which takes the nuclear debate into every part of the UK.

Is it simply down to a lack of political nous? Is it because the UK's radioactive waste management policy is in such a state that it doesn't know what else to do? Or is it playing a clever game? Could it be putting forward such an outrageous proposal to draw the public's attention away from the real meat of the Department of the Environment's (DoE) consultation

document on radioactive waste management policy? Will it simply withdraw the proposal at some later date, making a great show of a concession to the environment lobby, and hence claim green credentials?

The DoE's green paper is a stark admission of the abject failure which is the UK's radioactive waste management programme. We don't have a research programme into how high-level radioactive waste can be handled safely. Intermediate-level waste — which we do have a research programme for — still has nowhere to go. And low-level waste is piling up at such a rate that the industry is running out of places to hide it.

What of the proposal to loosen the safety noose around the neck of Nirex? The company, according to the DoE, should no longer need to show that the chances of any one individual, in any one year, contracting a fatal cancer is less than one in a million. Why not? Because, it is a justifiable but impossible target.

The landfill suggestion must be opposed, but only in the context of the bigger picture. In opposing the use of local landfills for nuclear industry waste, the very industry which has created the waste must also be opposed. The only sensible and sustainable response to the radioactive waste riddle is an end to production, only then can the debate be properly progressed.

FEW people ever believed the government when it claimed VAT was being put on domestic fuel and power for environmental reasons; it was a fund-raising move.

However, the scrapping of the increase in VAT from 8% to 17.5% does leave a gaping hole in the government's programme for meeting its international commitment to stabilise carbon dioxide emissions at 1990 levels by the end of the century. And it is a hole that will be harder to fill than was the financial shortfall in Chancellor Kenneth Clarke's budget.

Another major plank of the government's programme, the Energy Saving Trust, is already cracked — severely underfunded thanks to

decisions taken by the gas and electricity regulators.

In an attempt to stave off the backbench VAT revolt, the Chancellor tossed an extra £30 million to the Home Energy Efficiency Scheme. It was a welcome move, but a comprehensive home energy efficiency programme, aimed at saving energy and giving people warm homes they can afford to heat requires billions not millions of pounds.

Energy efficiency is the most cost-effective way of cutting CO₂ emissions, and it is wrong that people should have to live in damp, cold homes.

Diana Maddock, the Liberal Democrat MP for Christchurch, who won first place in the ballot for a private

member's bill, is to propose a bill on warmer homes and energy conservation. A similar proposal earlier this year by one of her colleagues, Alan Beith, had the support of the majority of the House of Commons but was 'talked out' by government supporters.

One of the backers of Beith's private members bill, Tory MP Robert Jones, has since become the environment minister responsible for energy efficiency. He now has an opportunity to show that he has not been bought off.

The government would be crazy to once again ignore the majority view of the House. Or does it care naught for the fuel poor, the environment and its own international commitments?

AFTER eight years with Scram, latterly as co-editor of *Safe Energy*, Mike Townsley is leaving to become a freelance journalist and consultant; he will continue to contribute news for the journal. Mike has made a considerable contribution to Scram and *Safe Energy* over the years, we shall miss him and we thank him for all his hard work.

FROM 1 January 1995, Scram and the *Safe Energy* journal will become a project of Friends of the Earth Scotland (see below for address and phone number).

We believe that this move will strengthen both organisations and improve our energy campaigning.

Safe Energy will retain its remit of covering nuclear power, renewable energy and energy efficiency developments in the UK and worldwide.

While the move will bring financial savings, we will be a self-financing project, relying on the continued generosity of our supporters.

CORRECTION

In the article "Solway Firth radiation worries", *Safe Energy* 102, 'critical group' dose rates for Dumfries and Galloway, and Cumbria were incorrectly given as 160mSv and 190mSv respectively;

the correct figures are 160 and 190 micro-sieverts. Our apologies to readers and to the author, Dr David Sumner.

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FEATURES

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NUCLEAR WASTE As the government considers the future of the nuclear industry and reassesses its policy on nuclear waste management, **Dr Patrick Green**, senior energy campaigner at Friends of the Earth (England, Wales and N. Ireland), argues that the industry's future lies in managing the radioactive waste it has already created, rather than producing more.

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ENERGY DIVERSITY The diversity value of nuclear power compared to renewable energy sources has been assessed by **Andy Stirling**, an independent consultant and part-time Research Fellow at the Science Policy Research Unit, University of Sussex. Here, he summarises the methodology and conclusions of a report produced for the Consortium of Objecting Local Authorities as part of its submission to the government's nuclear review.

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RADIATION AND HEALTH **Janine Allis-Smith**, of Cumbrians Opposed to a Radioactive Environment, reports on worrying links between British Nuclear Fuels and a major study of genetic material from West Cumbrian babies at the Westlakes Research Institute.

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ENERGY FUTURE As fossil fuels decline, other sources of energy will be needed to fill the gap. **Kerr MacGregor**, senior lecturer in energy engineering at Napier University, Edinburgh, and Chair of the Scottish Solar Energy Society, outlines his personal view of a solar future.

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NUCLEAR SECRECY **Llew Smith**, MP for Blaenau Gwent and a former MEP, looks at the wide range of excuses used by the UK government and its Whitehall civil servants for keeping information on nuclear issues from the country's elected representatives.

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CONTRIBUTIONS

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Scram reserves the right to edit

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Dounreay contamination

A confidential report into radioactive contamination on the Dounreay foreshore has highlighted the site's chronic waste management practices.

The leaked report, produced by Dounreay's operators, AEA Technology, details the discovery, since 1979, of 136 "radioactive metallic particles" on the Dounreay foreshore. However, despite the establishment in 1984 of an inquiry into the finds, AEA Technology is still no closer to identifying the source of the contamination.

Since 1984, on average a dozen particles have been found annually, including 12 in 1993 and six by November 1994. The finds, each between 1mm and 3mm long, have been dominated by Caesium-137, although four were composed mainly of cobalt-60. Most date back to the early 1960s and are believed to come from spent research reactor fuel, which is reprocessed at Dounreay.

In a statement issued to the work force after the report was leaked to the press, the site's director, John Baxter, said that the ongoing contamination "does not pose a hazard to the environment." Yet, the report states: "The dose rates from these particles are, however, substantial and surface dose rates in excess of 50mSv an hour are obtained from some ...

"The possibility, albeit remote, of ingesting a particle has been considered."

The report has been sent to the government's Radioactive Waste Management Advisory Committee (Rwmac) and the Committee on Medical Aspects of Ionising Radiation (Comare), both of which have begun their own investigations into the problem.

Possible leaks

Nine different possible routes for the contamination are considered in the report, including leaks from drains, cooling ponds, low-level waste pits, effluent tanks and an unlined waste shaft. AEA Technology also focus on three specific incidents which could have caused the contamination: a spillage in 1965, when a lorry fractured a temporary pipeline carrying water and "possibly some active particles"; an explosion in the "waste shaft" in 1977; and leaks following the clearing of blocked effluent pipes in 1983 by "high pressure jetting."

The report says, however, that these incidents would probably have released a finite number of particles which should now be found in decreasing numbers: "experience has, however, shown that the

rate of finds has remained fairly constant and other possible sources which involve a continuing movement of particles into the environment must be considered."

It further notes that: "A number of areas of contamination in the parts of the site adjacent to the foreshore are known to exist. In some cases the types of contamination are not well characterised and it is possible that the ground may contain radioactive particles as well as widespread lower level contamination."

While the Authority is adamant that there has been no cover-up, arguing that details of the finds have appeared in Scottish Office Statistical Bulletins, Alex Smith, a Labour MEP, has written to the President of the European Commission calling for a special investigation. In the letter, Smith says "I believe that there is evidence that the special team sent by the Commission from the 10th to 14th May 1993 to Dounreay ... may not have been given full and frank details by the management at Dounreay."

If, however, the team was privy to the AEA's ten-year investigation then Smith wants to know how they could give the assurance that: "The liquid discharges into the Pentland Firth and airborne discharges from the stacks of the Prototype Fast Reactor, Dounreay Fast Reactor and the Fuel Cycle Area, were found to be monitored continuously for all radionuclides of interest."

"The team verified the operation and efficiency of the above installations. The sampling locations and analytical laboratories were visited. The locations, procedures and equipment were found to be adequate for the purpose."

Further exacerbating the problems of safety at Dounreay is the AEA's decision to cut back the size of its radiation monitoring teams. A move which one member of the plant's health physics team believes will stretch safety cover to breaking point.

From January the size of the shift monitoring teams will be cut back "due to lack of funding."

Tony Benn was laughed at when he asked about safety at Dounreay in a meeting with senior UK Atomic Energy officials, in 1976 when he was Energy Secretary.

Benn recounts a conversation in his diaries: "During the 1970s, public concern about the safety of nuclear installations became a real issue, by which time I was Secretary of State for Energy, I had responsibility for the experimental fast breeder reactor at Dounreay which used plutonium required for the weapons programme."

"But here the safety rules appeared to be different on the grounds that it was a research establishment run by the Atomic Energy Authority. I discussed the problem with Arthur Hawkins the new chairman of the generating board and other officials."

"... I asked about safety ... very interesting. They said it just isn't safe. I think the term was 'geologically or structurally or in some other way physically unstable' and I said: 'you mean the problem of melt-out.'"

"They said 'yes', that the core might melt and go right through; what is called the Chinese syndrome — it melts itself right through to China on the other side of the Earth."

"Ned Peddy, who's a nephew of Lord Peddy of the Co-op movement, said: 'Of course the Americans have now ordered for their fast reactor a concrete containment ...'

"I said: 'If it is unstable what about the present reactor?'

"Peddy said: 'Don't ask me about safety at Dounreay' and everybody laughed."

"I said: 'I have to ask'

"'Well' they said, 'the AEA have different safety standards from the Nuclear Inspectorate because they are doing research and development.'"

"I suppose the plain truth is that Dounreay really isn't safe — that's why it's there." □



Mike Townsley

Dounreay: leak report leaked

Waste dump criticism

DOUBTS have been expressed in a new report* from The Royal Society over plans by Nirex to build a repository for low and intermediate-level waste under Sellafield.

Nirex asked and paid the society to review its general scientific strategy.

Endorsing the government's commitment to deep disposal, the society comments that if it proves impossible "there will be a need for more surface storage facilities and for a programme of periodical repackaging of wastes, with concomitant health risks to workers and the public and with additional costs."

However, it seems less than convinced by Nirex's approach to site selection, commenting that: "This early definition of a potential repository zone (PRZ) makes their scientific task more difficult: instead of being able to proceed in stages, by showing there are locations in the area that are potentially suitable for a repository, and then by determining by a process of optimisation which of these locations is preferred, Nirex have set themselves the task of demonstrating that a particular volume of rock is suitable."

"The optimal siting of a repository should be determined through highly iterative interaction between the scientists and the design engineers, as the scientists' understanding of the site characterisation develops. The study group has seen no evidence of such a close relationship."

Much of The Royal Society's criticism concerns the disposal of long-lived intermediate-level waste (ILW). It favours the idea of building a two-stage repository. The first would be in the area currently being investigated by Nirex and would host low-level waste and short-lived — half-lives in the order of decades — ILW. The second, "contributing to a sounder strategy for the UK, requiring extra time and further work, would be aimed at finding an acceptable location within Sellafield area (sharing access with the first phase) for a smaller repository for long-lived ILW, and possibly HLW [high-level waste]."

The society encourages consideration of the possibility that "a repository, at least for long-lived waste, might be sited further to the west and somewhat deeper."

Optimistic timetable

The society further views the Nirex timetable as "optimistic". Although it believes "construction should begin as soon as is practicable..." on the Rock Characterisation Facility. Scepticism is enhanced by the society's reservations over the exact location of the repository within the Sellafield area. "The PRZ may have to be extended to cover a wider area, which will take longer to characterise in detail."

It is also critical of secrecy surrounding Nirex's work: "We were forcibly struck during this study by the extent to which some scientific reports of Nirex are protected from wider scrutiny by being classified 'commercial-in-confidence'".

The society is also highly critical of the lack of research into HLW disposal in the UK and notes the trend away from reprocessing towards interim storage of spent fuel, observing that there is also no work being done on direct disposal of spent fuel.

■ Calls for a wide-ranging inquiry into plans to dump nuclear waste under Sellafield are being backed by the government's Radioactive Waste Management Committee (Rwmac) which wants the inquiry into the proposed Nirex underground Rock Characterisation Facility (RCF) at the site to consider "issues that are wider than the RCF itself."

Rwmac is critical of the idea that the RCF, which many see as a Trojan horse which will create unstoppable momentum for using the Sellafield site, could be given planning permission after an inquiry restricted to only local planning issues.

Sir John Knill, chairman of RWMAC, says the committee's "long-standing view is that there should be a two-stage inquiry. The first would examine generic issues, which would consider alternative sites, and it is the Committee's opinion that this should be held when the RCF is being considered." The second would focus on a detailed safety case when the final repository planning application is submitted. □

* "Disposal of radioactive wastes in deep repositories", The Royal Society, November 1994; 194pp, £27.50.

Wrong site for dump

NIREX has broken UK, European Union (EU) and International Atomic Energy Agency (IAEA) guidelines in choosing Sellafield as the site for their nuclear waste dump according to a Greenpeace report.*

Entitled Earthquake, the report says the site selection criteria used by Nirex to chose Gosforth near Sellafield have never been clarified begging the question "as to whether the decision was based on political expediency or scientific evidence."

While the international guidelines are not legally binding, they do present a consensus view on site selection criteria.

The UK's own criteria say that "areas selected should be ... outside regions of abnormally high seismicity." But the EU comments that "seismicity shall be low," and the IAEA states: "The site must be in an area sufficiently removed from fault zones that earthquakes are unlikely to affect the wastes."

However, reports Greenpeace, the site is less than 3km away from a major fault zone which, according to HM Inspectorate of Pollution (HMIP), "may be currently active." An HMIP report

said: "Current evidence suggests that the fault-bounded West Cumbrian coast may be tectonically active, and by analogy with the 1865 earthquake at Rampside, that seismic pumping of ground water may occur around Sellafield." The report adds that "hydrogeological changes accompanying earthquakes could be the most severe hazard affecting a nuclear waste repository."

Referring to the 1865 earthquake, Greenpeace warns: "A similar earthquake could obviously bring radioactive water flowing up to the surface. Yet Nirex do not even consider this 'most severe' risk in the four volumes of their interim safety assessment report."

International consensus

Greenpeace's report further highlights the international consensus that the site should have relatively simple geology, unlike Sellafield which the government describes as "geologically and structurally complex."

Nirex also ignores the recommendation that underground water flow should be low or negligible. Greenpeace cites a Glasgow University report which said the measured flow rates at Sellafield are "40 times too great to be acceptable" and concludes that the proposed repository is

"in a poor position where flow directions ... are towards the surface."

The area is situated near a major sandstone aquifer that is an important water resource and "might be used for drinking water by future generations." The government's own criteria argue that "... any flow pattern should be such that flow lines do not lead to fractured bed rock or to potential aquifers."

Sir Hugh Rossi, Chair of the Commons Environment Committee in 1989, said the Gosforth site was "in political terms .. the easiest solution," however, he said the science must also be right "and that must be the most important thing."

Greenpeace concludes: "The immense scientific problems with the Gosforth site have become clearer since this statement was made... The folly of neglecting site selection criteria in favour of the 'politically easiest' solution has been clearly revealed. It remains to be seen whether the science is indeed 'the most important thing' or whether the local population will be forced to accept the dump regardless of the consequences." □

* "Earthquake: how Nirex is ignoring international safety guidelines on the siting of a nuclear waste dump", Greenpeace, November 1994.

NE privatisation doubts

NUCLEAR ELECTRIC'S hopes for privatisation have taken a serious knock. The company's losses, before the non-fossil fuel levy, have increased and it admits that the levy will remain high, at around 10%, for the time being.

Its interim results show an increase in losses from £118 million last year to £126 million this year, before the levy. After levy receipts of £625 million the company's 'profit' jumped by £2 million to £499 million.

However, in announcing the results, Nuclear Electric (NE) expressed the concern that the electricity regulator, Offer, was failing to collect enough from the levy to meet the £9.2 billion it needs by 1998 — when the levy is due to end — to meet decommissioning liabilities. It now fears that it will not be possible to reduce the level of the levy but still claims it will be profitable without the subsidy by 1995-96.

In 1990, the company's chairman, John Collier, said: "I'm absolutely fed up with the idea of a nuclear levy — it gives the public the idea we are a lame duck ... it is very important that we continue to get that levy decreasing. I want it down."

NE also wants any shortfall in the levy, currently around £200 million, collected within a year of the levy expiring in April 1998. However, the regulator could take up to 2002 to collect the shortfall. Launching the interim results, NE's chief executive Bob Hawley said: "We wish the

government would take its levy and liabilities and go away."

NE has also rejected as outrageous proposals from Offer that there should be an asset swap between it and Scottish Nuclear (SN) to curtail the growing influence of the companies in the electricity market. Offer believes that by giving SN some of NE's advanced gas-cooled reactors and similarly giving NE either Torness or Hunterston "would protect consumers against the nuclear companies' market power." Collier commented: "Is this to be the result of improved performance?"

Nuclear review

NE also took the opportunity to comment on progress with the government's nuclear review; Collier said it was "gratifying to see support for privatisation from industry commentators, senior City analysts and even the regulator himself."

Collier also dismissed the anti-nuclear arguments put to the government by anti-nuclear organisations: "We have seen the arguments that the UK doesn't need nuclear power to meet CO₂ emission targets — despite the frankly implausible nature of such a notion. We need all reasonable measures to limit CO₂. We have seen doubts cast on our assertion that Sizewell B has been built to time and cost — despite clear proof to the contrary — the figures are in the public domain. And we have seen pessimism concerning our costings for further nuclear power station construction and the assumptions we have

made — despite the rigour with which we and others have crawled over those figures ... after all, if the plant is built it is we — a privatised NE — who would have to live with the consequences of getting it wrong."

On new build Collier said: "Our advice is that it is possible. But is it desirable? We would only go ahead if we thought we could add shareholder value and if the market conditions were right."

■ Meanwhile, the man who pulled the plug on nuclear privatisation in 1989, John Wakeham, now Lord Wakeham, has entered the fray.

In an unusual move, Wakeham sent an open memo to the President of the Board of Trade, Michael Heseltine, arguing that the nuclear generators should now be privatised and all subsidies should be scrapped.

He further called for the establishment of a state agency to oversee the decommissioning of nuclear plant and to administer the huge liabilities over a period up to 150 years.

Wakeham has clearly lost touch since being kicked upstairs by John Major. The memo argues that the industry has proved it can operate successfully and safely in a competitive market, adding: "The sooner they are privatised the better."

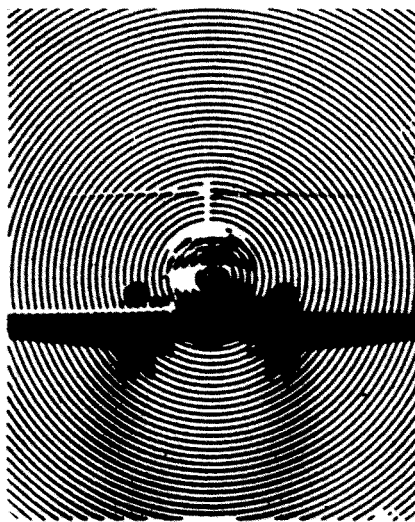
Wakeham also commented: "Scottish Nuclear consider their proposal for dry fuel storage represents a significant cost saving to them and I believe they should be allowed to proceed with them as soon as possible." □

Transport troubles

FLIGHTS of plutonium between the UK and Switzerland should not be permitted until safety criteria have been revised to meet international standards now under discussion, says the US based Nuclear Control Institute (NCI).

In a letter to the UK transport secretary, Dr Brian Mawhinney, the NCI argues that plans to fly plutonium-uranium mixed oxide from Carlisle to Zurich in Switzerland, over the next 12 months, should be abandoned pending the outcome of an ongoing International Atomic Energy Agency (IAEA) review of guidelines for air transport of radioactive material.

At the request of the UK government, the IAEA has drawn up new, more stringent guidelines for air transports. NCI comments: "While their proposal for a specific air-transport standard is an improvement over the existing standard that applies equally to all transport modes, there is considerable room for improvement since the draft falls far



short of much stricter US air-transport requirements."

Current IAEA standards call for the transport flask to be dropped onto an unyielding surface from a height of nine metres, the equivalent of a 13 metre per second (m/s) impact; the new standard would require impact tests of 85m/s. But the US requires a transport flask to withstand an impact at 129m/s or for international trans-shipments to

withstand the actual crash test of a cargo aircraft at an impact velocity of 282m/s.

Transport flasks tested to the old standards may not be strong enough to withstand a high-speed air crash, according to the IAEA, which says that "clearly individual member states have the option to forbid" transport of radioactive waste until the new guidelines are drawn up.

Since British Nuclear Fuels is prepared to ignore the IAEA's advice and carry on business as usual, it is up to the Ministry of Transport to put a halt to these dangerous flight," warns NCI president Paul Leventhal.

The NCI concludes: "Air shipments of plutonium and other radioactive materials under existing lax standards poses an unacceptable risk to the public. We urge an immediate halt to such transports and call on the British government to instruct its representatives to the IAEA to support stringent new guidelines comparable to existing US standards that would ensure adequate protection of public health and the environment." □

Dungeness danger

HAIRLINE cracks in the steam pipe welds in one of the Dungeness B AGRs "pose a serious threat" and could force the station to close, according to a confidential Nuclear Electric (NE) report.

Dungeness B has been shut down since early September following the discovery of the cracks, and NE is preparing to submit detailed safety reports for reopening the station to the

Nuclear Installations Inspectorate.

The company is concerned that there may be further cracks in pipe welds within the concrete reactor vessel. It is very difficult to inspect these pipes and if damage is found then it would be both costly and time consuming to repair.

According to John Large, an independent nuclear engineer, failure of a pipe within the reactor vessel could be disastrous, leading to the release to the atmosphere of some 30 tonnes of radioactive coolant gas. NE admits that this is a "possible scenario" but claims

it is a "scare scenario." As an alternative, NE says it is possible that any release of radioactive gas could be within the site's authorised limits.

NE's technical support manager, Derek Dominey, says the cracks are only a few millimetres in length and are confined to the surface of the pipes. According to Dominey they are a well-known phenomenon which is caused by stress during the welding process: "We have not yet reached the point where we are satisfied that there is no problem but I am confident that we shall." □

Chernobyl to close?

EUROPEAN UNION (EU) pressure on Ukraine to close Chernobyl looks as if it will finally pay off, as the country's Foreign Minister, Hennady Udovenko, assured a meeting of EU foreign ministers that Ukraine is committed to the plant's closure.

The declaration, made at the beginning of October, should now unlock some Ecu500 million of EU funds and a further £200 million for the Group of Seven major industrialised countries.

According to one EU diplomat: "This is the first time that ... Ukraine has said to the West it is politically committed to closing Chernobyl. We hadn't known where we stood before. Now we do."

EU and Ukrainian officials are now considering how and when the plant can be closed. According to the EU: "This



will be far from an easy task. There is more demand for energy in Ukraine than there is in France. What is clear after our talks with the Ukrainians is that the sums of money they will need are far greater than we have put on the table."

Ukraine is seeking closer links with the EU as it tries to break out of Russia's shadow. However, the EU made clear

that further co-operation depended on the closure of the notorious station. The German Foreign Minister, Klaus Kinkel, left his Ukrainian counterpart in little doubt that the plant's closure was non-negotiable: "I have one clear statement: Chernobyl must be shut down. It will not be easy because of Ukraine's energy needs, but the risks are just too great." □

North Korea-US deal

NORTH KOREA has agreed to abandon its high-plutonium-yielding graphite reactors in exchange for two western-built and financed light-water reactors, which pose a much smaller proliferation threat.

After 19 months of tense and tangled negotiations, and as many false dawns, US negotiators finally made the last Stalinist State an offer which was too good to refuse.

In exchange for closing its operating magnox-type reactor and abandoning work on two more, North Korea will receive two shiny new light-water reactors, worth \$4 billion, courtesy of a consortium including Germany, China, Russia, Japan, South Korea and the US. It has further received good intentions from the US that full diplomatic recognition could be achieved, thawing the 'cold war'

status that has prevailed in relations between the two states since the 1950-53 Korean War.

Welcoming the agreement, North Korea's first deputy foreign minister, Kang Sok-ju, said it should "eliminate the so-called suspicion about our nuclear programme."

The US ambassador, Robert Gallucci, who headed the negotiating team, said the deal also included provision for an International Atomic Energy Agency (IAEA) safeguards inspection of two nuclear sites at Yongbyong which could yield evidence of a clandestine nuclear weapons programme. However, the exact details of the safeguards inspection have yet to be announced. Even if the safeguards inspectors do finally gain unlimited access to the North Korean programme, it is difficult to say what this will achieve.

According to the IAEA director, Hans Blix: "Humpty Dumpty has fallen down." Blix commented earlier this year that even if tests were carried out on spent fuel from

the Yongbyong complex it would not be possible to determine how much plutonium had been extracted: "There is no way to put Humpty Dumpty back together again."

According to South Korea the two new stations — which they will build — will not be operational until 2003. In the meantime the US has promised to provide oil to make up the North's energy shortfall.

This leaves plenty of time for relations to deteriorate once more. North Korea is a highly secretive state where government propaganda depicts the South as a land of harshly exploited beggars, certainly not capable of supplying state-of-the-art nuclear power stations. Now, however, it will have to risk opening up its borders to thousands of South Korean engineers.

North Korea's economy is in a bad way and the country's dictator Kim Jong Il, who has only just taken over power following the death of his father Kim Il Sung, is believed to have only the most fragile hold on power. □

NUCLEAR WASTE

The nuclear industry has a future — this doesn't involve either privatisation or the construction of new nuclear power stations — it is needed to manage the legacy of radioactive waste it has created over the past forty years, argues Dr PATRICK GREEN, Senior Energy Campaigner at Friends of the Earth (England and Wales).

Managing the future

NUCLEAR ELECTRIC wants to be privatised. Yet, it admits that nuclear power stations cannot be built without massive government subsidy.

Further, the nuclear industry is unable to "prove" that its plans for the disposal of radioactive waste will be safe. New nuclear power stations will add to the mounting legacy of radioactive waste that will be passed on to future generations.

Friends of the Earth (FoE) believes that any attempt at privatisation will be a waste of public money and result in a continued failure by the industry to manage its legacy of radioactive waste.

There is an alternative. The government could use the opportunity provided by the nuclear review to restructure the industry into a nuclear waste management industry.

Forty years ago when the government first established its commitment to nuclear power the public was told that it was entering a new era of cheap power. Nuclear power didn't meet this early promise, leading to the failed attempt at privatisation in 1989. The resultant five-year moratorium and nuclear review presents the industry with a final opportunity to prove itself.

When the government announced the terms of reference for the review, the Energy Minister, Tim Eggar, stated that it was the government's belief that: "the future role of nuclear power in the UK's electricity supply will depend on it proving itself competitive while maintaining rigorous standards of safety and environmental protection."

The onus, therefore, is on the industry to demonstrate that it has met the goals set by government, namely that it has proved itself both safe and economic. As the government has acknowledged, a key test of the industry's case is: "Whether any new nuclear power stations could be built with private sector finance."

On this basis, if during the review the industry fails to prove that it is either economic or safe, it will have failed to meet the task set for it by the review.

Nuclear Electric (NE), the state owned nuclear generating company, wants the

government to privatise it and allow it to build a new reactor at Sizewell in Suffolk (Sizewell C). In the run-up to the review, NE bullishly claimed: Sizewell C could be profitable without government subsidy and funded entirely from the private sector; it was reducing the huge costs of radioactive waste management and decommissioning; and the company, therefore, was fit for privatisation.

In its evidence to the nuclear review, NE further claimed that nuclear power was "essential" and the most cost-effective way of combating climate change.

Nuclear fails key test

In contrast to NE's claims, FoE's evidence to the review demonstrated that the nuclear industry has failed to prove either that it was economic or safe.

FoE's evidence demonstrates that:

1) NE has failed to comply with the critical objectives it set for itself for the nuclear review: to reduce the level of the Nuclear Levy and to start Sizewell B on time and within budget.

In 1990, John Collier, chairman of NE, commented: "I'm absolutely fed up with the idea of a nuclear levy — it gives the public the idea that we are a lame duck. It is very important that we get the levy decreasing. I want it down."

In 1990/91 the levy was £1195m, in 1991/92 £1265m, in 1992/93 £1280m and in 1993/94 the levy was £1230m.

Sizewell B is massively over budget and has missed its planned start-up date.

2) NE has now admitted that new nuclear power stations cannot be built in the private sector without significant government subsidy.

It now estimates that at least £1000m will be needed. Independent estimates suggest that the real level of subsidy could be four times higher.

NE argued that this subsidy was justified because nuclear power was essential for combating climate change.

3) Nuclear power does not offer sufficient strategic or environmental

benefits to justify continued state support.

In particular, FoE's evidence found that nuclear power is one of the least cost-effective ways of combating climate change (16th out of a list of 17 options, see table below). The most-cost-effective way of combating climate change is to invest in energy efficiency.

4) The problems presented by the legacy of nuclear wastes created by nuclear power have not been solved. Therefore, nuclear power is not environmentally sustainable.

Nirex, the nuclear industry's radioactive waste executive, cannot prove that its proposed nuclear waste dump at Sellafield will be safe. Nuclear waste will therefore have to be stored and passed on to future generations.⁽¹⁾

Privatisation

FoE has argued that these failures mean that it will be impossible to privatise NE.

In 1989, the government decided not to proceed with the privatisation of the nuclear power stations because it would have been "simply impossible to privatise nuclear power in any real sense of the word." If the government had carried on with privatisation, "nuclear power — although in private hands — would have effectively remained in the public sector."

Carbon dioxide abatement options in order of cost-effectiveness

CO₂ saving by 2005 (million tonnes)

Fuel switching	8.07
Appliance efficiency improvements	25.97
Industrial CHP	20.80
Lighting efficiency improvements	32.72
Small-scale CHP	6.89
Cooking efficiency improvements	4.05
Service sector space heating	31.63
Advanced gas turbines	35.28
Water heating	8.63
Industrial motive power	22.92
Domestic space heating	34.69
City-wide CHP	12.17
Renewables	17.29
Process heat	15.44
Industrial space heating	7.77
Nuclear power	33.24
Advanced coal technology	3.19

Source: Efficiency Without Tears, FoE, 1992

FoE considers that this situation still applies today. NE now accepts that private capital will not be forthcoming without government subsidy and has failed to justify why such continued subsidy should be provided.

NE has argued that even if the government decides not to subsidise Sizewell C, the company should still be privatised. In this case, the company has suggested that it "would examine other market opportunities which might lead to investment in alternative power plant or other business activities."

In FoE's view, such an attempt at privatisation would establish inappropriate priorities for the nuclear industry and would not represent value for money for the taxpayer.

The priority should be to ensure that the nuclear industry focuses its resources on the management of the formidable radioactive waste legacy it has created to date.

Institutional & policy reform

In FoE's view, the nuclear review must lead to government restructuring of the nuclear industry. As the Royal Commission on Environmental Pollution recommended in 1976, a new nuclear waste management body must be established which is independent of the nuclear industry.

It must be given free rein to start from scratch on nuclear waste management strategies, with a comprehensive approach encompassing all aspects of nuclear waste. This would include: high-level waste and plutonium management; strategies to minimise waste arisings from continued operation of existing reactors; examination of the rationale for reprocessing; the decommissioning of old reactors, submarines and other irradiated civil and military equipment.

The new independent body must allow open public debate and examination of all possible options and criteria.

Under a new pioneering policy for waste production and management, based on the government-endorsed principles of sustainable development, nuclear power and reprocessing should have no role and must be abandoned.

In addition, the government must face up to the scientific reality that development of a robust safety case for nuclear waste disposal is not currently possible and is extremely unlikely to be achieved within the timescales currently being considered for the development of the nuclear waste dump at Sellafield.

Disposal is not scientifically credible and if implemented now could not be relied upon to ensure public safety.

Given the uncertainties that pervade the long-term management of radioactive waste, it is essential that flexibility is incorporated into the strategy adopted. This means that the wastes must be fully and easily retrievable so that they can be treated or repackaged should the need arise. Under the constraints of current technology such flexibility may be achieved only through the adoption of above-ground retrievable storage.

It is essential that interim storage is developed in parallel with continued and rigorous long-term research and financial provisioning. This would allow the next generation to decide whether knowledge has increased sufficiently for a permanent solution to be adopted or whether storage should be continued. Financial provisions must be set aside in an independent waste fund so that the next generation has the resources to fund the waste management decisions which it decides are appropriate.

In this way, the UK may find a method of dealing with its nuclear legacy which is built on a foundation of public understanding, trust and a sense of responsibility to future generations. Without this, the management of nuclear waste in the UK will continue to be a litany of confrontation and suspicion and, above all, failure.

Waste management

It should also be recognised that managing the nuclear waste legacy does not predicate a declining industry. The acceptance of interim storage of nuclear waste requires a strong industrial and research base.

The UK was the first country to establish a nuclear power programme, and could be the first to develop an industrial-scale programme of decommissioning and waste management.

Within the UK, research for Cumbria County Council has concluded that there are "substantial" employment opportunities arising from on-site storage of radioactive waste and spent fuel at existing nuclear sites.

The submission from the British Nuclear Industry Forum says: "Significant business opportunities also exist in the growing world market for the management of all types of radioactive waste and the decommissioning of plant, both reactors and fuel cycle facilities."

This market is considerably more secure than the market for further nuclear power stations. Countries that have a

mature nuclear industry will be faced with the need to manage and store waste and clean up contaminated sites and plant, particularly in the former Soviet Union and in the USA.

Equally, employment in a nuclear waste management industry would be considerably more secure than in a declining nuclear power industry. This fact must be recognised by the nuclear trade unions if they have the best interests of their members at heart.

The market opportunities for genuine waste management and clean-up activities, as opposed to further waste creating activities such as reprocessing, is therefore clearly substantial.

FoE considers that government-led development of such an industry could therefore lead to the creation of significant economic and employment benefits and enable this generation to truly honour its commitment to future generations by ensuring that the substantial legacy of the 40-year failed experiment with nuclear power is managed in a scientifically credible manner.

Need for reform

FoE has recommended that the Sellafield site is established as a centre for excellence in nuclear waste management and decommissioning. (There is a large amount of decommissioning work to be done on the site itself).

Nirex should be disbanded and its responsibilities for waste management given, along with the responsibilities of Nuclear Electric and Scottish Nuclear (SN) for decommissioning strategy, to a newly constituted body which will run the Sellafield site. This body should be owned by the Department of Trade and Industry and operate within policy objectives set by the Department of the Environment.

NE and SN should remain in the public sector and be charged with operating existing AGR reactors until their phase-out at the end of their design lives. Further, the prolific nuclear waste production arising from continued operation of NE's Magnox reactors necessitates a review of their continued operation, geared towards their phase-out as soon as practicable. □

1 "Time to face reality", FoE Briefing; September 1994

Further information

"Beyond safe and economic", a submission from Friends of the Earth Ltd to the Nuclear Review, November 1994.

"Time to face the inevitable", a submission from Friends of the Earth Ltd to the Review Of Radioactive Waste Management Policy, November 1994.

ENERGY DIVERSITY

Amongst the powerful evidence submitted to the government's nuclear review by the Consortium of Objecting Local Authorities, was an assessment of the diversity value of nuclear power compared to renewable energy. ANDY STIRLING, author of the diversity report, summarises his methodology and conclusions.

Putting eggs in the energy baskets

OVER the past couple of decades, energy policy literature has provided a truly happy hunting ground for collectors of rhetorical platitudes. Perhaps foremost amongst the many examples is the notion of diversity. Both in its apparent innocence and in its benign connotations, it rivals the proverbial motherhood and apple pie. The need for diversity is repeatedly invoked in the energy policies of industrialised countries. It is dutifully alluded to in pronouncements by the European Commission and the International Energy Agency. For advocates of marginal energy options in need of public support, what could be better than an ostensibly neutral appeal to the general virtues of diversity?

Nowhere has the concept of diversity enjoyed a higher profile than it has in the UK electricity supply debate. The arguments put in 1984 by the government and CEBG for the Sizewell B PWR made prominent references to the need for diversity. The case made in 1988 for the Hinkley Point C plant was similarly both based and approved largely on the claimed diversity benefits. The provision of indirect public support for existing and new nuclear investments through the Non-Fossil Fuel Obligation (NFFO) and the Fossil Fuel Levy (FFL) was rationalised by the government on introduction of the 1989 Electricity Act almost entirely on the grounds of diversity. The claimed diversity benefits of nuclear power remain a key part of Nuclear Electric's case for further government support and guarantees for Sizewell C.

Given this high profile, it is remarkable that the concept of energy diversity seems largely to have escaped serious scrutiny. Despite explicit recommendations by the Inspectors at both the Sizewell and Hinkley inquiries, and clear undertakings by the then Energy Secretary John Wakeham at the time of electricity privatisation, neither the government nor the electricity industry have so far published any formal analysis of energy diversity. With the exception of a brief exchange initiated by the Council for the Protection of Rural England at the Hinkley Inquiry in 1988, even sceptics have failed seriously to criticise the diversity case for nuclear power. It is strange that diversity should remain

virtually unexplored, whilst other high profile strategic issues (such as environmental impacts) have spawned entire academic industries.⁽¹⁾

Perhaps the reason for this surprising neglect lies in a perception on all sides that diversity is simply a vehicle for special pleading, and so not worth taking at face value. Such cynicism is certainly encouraged by former Energy Secretary Nigel Lawson, who acknowledged subsequently that his own enthusiastic diversity argument for the PWR programme was simply an expedient code for "freedom from NUM blackmail". Yet, outside the energy debate, diversification remains a very important and well established element in government and corporate strategies. Wherever there is ignorance over the future, it is wise not to put all the eggs in one basket.

Given the volatility of resource prices, the technology dependency of electricity supply investments, the long lead times and large unit sizes of generating plant, and the high political profile and global exposure of energy supply chains, there does exist a genuinely strong argument for diversity in electricity supply. The questions are: What exactly is meant by diversity? What is it that must be diversified? What trade-off should be struck between diversity and other measures of performance? A novel "diversity optimisation" technique offers one way of answering these questions.⁽²⁾

A novel approach

When faced with the problem of ignorance, the traditional approach is to identify a variety of possible future scenarios and assign probabilities. From the point of view of the electricity industry, there are two basic problems with this. First, those scenarios which are actually considered tend to form only a fraction of the enormous range of possible permutations of future events. The results obtained are highly sensitive to the inclusion or exclusion of certain scenarios. Second, the assignment of probabilities to individual scenarios is an entirely subjective exercise. Even quantifiable performance criteria (like fuel prices) are notoriously unpredictable. Past experience is a poor guide to future performance. Beyond this, however,

many key aspects of the performance of the different generating options are intrinsically unquantifiable. Commercial developments, industrial action, regulatory or political changes, unforeseen environmental problems or the rise of international tensions may all exert indeterminate influences on the prospects for different options. The assignment of probabilities to such factors amount, at best, to guesswork. At worst, they are entirely spurious and dangerously misleading. Their complexity makes them vulnerable to error and invites deliberate or unintentional bias.

The key idea behind the diversity optimisation technique is that the solution (diversity) is more easily analysed than is the problem itself (ignorance). The state of diversity is defined as a combination of three subordinate conditions: variety, balance and disparity. 'Variety' reflects the simple number of options in a portfolio. All else being equal, the greater the number of options, the more diverse the portfolio. 'Balance' represents the degree to which reliance is placed on the different options in the portfolio. All else being equal, the more balanced the portfolio, the greater the diversity. Finally, the notion of 'disparity' addresses the degree to which the different options are qualitatively different from each other. As with any analysis, this is covered in defining the different generating options themselves — dividing them up according to their disparity under a range of criteria. Once options have been identified, it is a straightforward task to measure the variety and balance of any conceivable portfolio. Indeed, a simple mathematical tool called the Shannon-Wiener index has been derived from first principles for just this purpose in physics and information theory.⁽³⁾ It is routinely applied to the analysis of ecological diversity.

Diversification is a trade-off between the performance of individual options and the value of diversity as a hedge against ignorance. The lower the confidence in performance projections, the greater the value of diversity. Having identified a measure of diversity, it is a relatively simple task to calculate the optimal contributions by each option to a portfolio as a whole.⁽⁴⁾ The advantage of this procedure is that it requires only three basic steps: the identification of a set of

options; the assignment of ranks to express the best available performance data; and the assignment of an importance weighting to diversity. The results obtained are thus highly transparent, and easily checked for consistency or sensitivity to alternative assumptions.

Diversity optimisation can be used to make precise prescriptive recommendations. However, a more robust use is to generate a map of the way that the composition of 'diversity-optimal' portfolios vary according to the assumptions made. In this way, conclusions may be drawn which reflect a wide range of contrasting positions concerning the relative performance of the different options, and the importance of diversity itself.

Exploring different options

Nuclear power presently contributes less to the UK generating mix than does coal. Under some forecasts, it may in future contribute less than gas. To this extent, it seems clear that existing and new nuclear capacity (whatever its problems) does provide diversity. However, the real question is whether nuclear power offers the most efficient way of securing diversity. Are there alternative options which offer more cost-effective diversity benefits? According to the government's own assumptions and data, what would be an "ideal" mix of generating options?

The first step is to define the various electricity supply options themselves. The categories coal, oil, gas, nuclear, hydro, biomass, geothermal, wastes, solar, tidal, waves and wind provide a conventional basis for discussion. The renewable options distinguished here are, in many cases, amongst the most disparate in terms of their primary resources, their technologies, their suppliers, their distributions and their mode of operation. Indeed, it might justifiably be argued that the renewables might be divided up more than this and still remain no less disparate than the conventional options. It would certainly be difficult to claim that the renewables have been unduly favoured by dividing them up in this way. It is a simple fact, frequently acknowledged by government, that the renewables are highly disparate.

The next step is to assign ranks to all the various options to reflect their performance. The present provisional exercise uses recent government generating cost and resource data (at constant 8% discount rates),⁽⁶⁾ with a constraint applied to contributions by intermittent renewables. No consideration is made of any general environmental or supply security issues. This

means that the overall performance of many renewables may be felt to be understated. However, the effect of taking into account wider strategic issues (as well as cost estimates which diverge from those of the government) are explored by conducting a sensitivity analysis. A 'high' performance case is based on costs 33% lower than current government figures. A 'low' performance case assumes costs turn out 50% higher.

The final step is to assign a value to diversity itself. For its part, the position of the UK government is implicit in the argument made for new nuclear investment at the Hinkley Inquiry and in the stated rationales for the NFFO and the FFL. In short, each involves an acknowledgement that nuclear power demands a premium price. Payment of this price was rationalised, at least in part, on the grounds of diversity. The premium, divided by the additional diversity actually achieved, provides a rough measure of the UK government's valuation of electricity portfolio diversity. The inevitable uncertainty involved in this approach is also tackled by testing for sensitivity.

The UK electricity supply portfolio which is optimal under mid range (government) assumptions is shown in below. If the renewables are expected to work out 50% more expensive (or to pose correspondingly prohibitive planning difficulties) the optimal portfolio is also shown below. In these, as in all cases explored where nuclear costs exceed 2.9p/kWh, the optimal renewable contribution to the UK electricity supply mix is larger than that of nuclear power. Where renewable costs are assumed to be 50% higher than current government assessments and nuclear costs 33% lower than mid range estimates, the optimal nuclear contribution does begin to exceed that of the renewables. However, even under these extreme circumstances, official figures show that a firm renewable capacity equivalent to that of

a large PWR is still available in the UK at below nuclear costs.

The results of this exercise are clear. Over a wide range of assumptions concerning the likely costs of nuclear power, the fossil fuels or the renewables (and even without taking account of environmental or wider strategic factors) it appears that renewable investments offer a more efficient way of fostering diversity in the present UK electricity system. If the government truly believes that diversity is best achieved by the unfettered operation of electricity markets, then there can be no rationale for supporting any option on the grounds of diversity. If, on the other hand, it is judged that some form of intervention is justified in order to maintain or improve electricity system diversity, then it is clear from this exercise that such support would be far more efficiently directed at the renewables than it would at nuclear power. □

* Andy Stirling is an independent consultant and part-time Research Fellow at the Science Policy Research Unit, University of Sussex, and author of "New Nuclear Investments and Electricity Portfolio Diversity" Volume 5 in the submission by the Consortium of Opposing Local Authorities to the Nuclear Review, September 1994.

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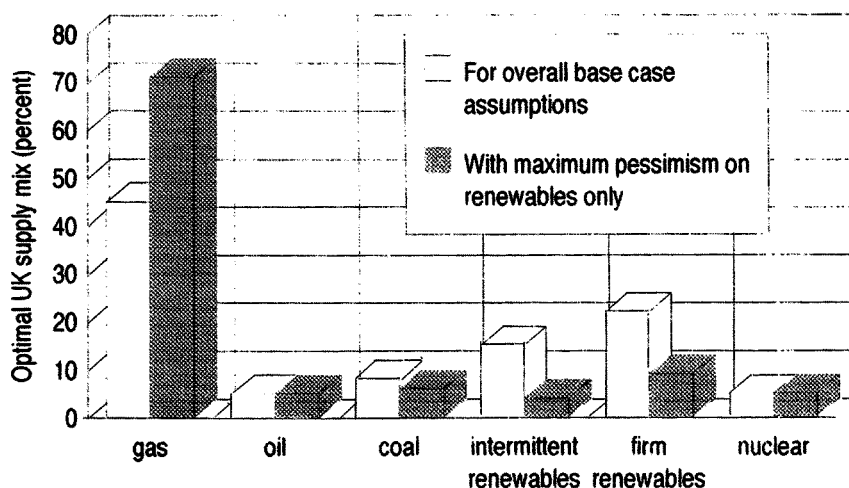
1 One such example of unjustified ambitions in analysis is provided by environmental valuation (A. Stirling, "Environmental Valuation: how much is the Emperor Wearing?", *Ecologist*, June 1993).

2 As outlined in more detail in A. Stirling, "Diversity and Ignorance in Electricity Supply Investments", *Energy Policy*, March 1994 and up-dated in ref 1.

3 Given by $-S_i P_i / \ln P_i$; where P_i represents the proportional contribution of each of i options.

4 The optimal contribution of any option is given by $\exp(R/D) / S_i \exp(R_i/D)$; where R is the performance rank of that option and D is the importance weighting for diversity.

5 Drawn, for the renewables, from ETSU-R-82 of March 1994.



RADIATION AND HEALTH

Can we trust the results of research carried out by bodies with an interest in the results of the work? If not, asks Janine Allis-Smith of Cumbrians Opposed to a Radioactive Environment (Core), should BNFL be allowed to dominate research into the DNA of Sellafield's children?

BNFL links with DNA study

WEST CUMBRIA Health Authority's ethics committee has approved, in principle, a plan to collect and store samples of genetic material and blood from 8,000 babies born in West Cumbria over the next five years at the BNFL laboratory at the Westlakes Research Institute, near Whitehaven. Research will be divided between the BNFL laboratory and the department of Child Health at Newcastle University, with BNFL funding to the project via a Westlakes Research (Trading) Ltd contract.

Following local media coverage in May, quoting Core's concerns about siting the proposed DNA bank at Westlakes with its strong BNFL link, the Welsh MP Llew Smith raised the question of the project in the House of Commons.

The *Sellafield Newsletter*, a weekly BNFL in-house publication, states: "While it could also help research into the effects of radiation, BNFL believes the study will prove there is no difference between genetic make-up of children born to Sellafield fathers and those from the rest of the region."

The pioneering project, reportedly the first in Europe, has as far as Cumbrian MEP Lord Inglewood, "can ascertain ... [there is] no government or European Commission backing," it is a "joint venture between BNFL and Newcastle University."

"If BNFL had applied in its own right to the West Cumbria Health Authority, to research West Cumbrian babies, would they have been given permission? If not, why are they allowed access through the back door?" wonder local parents.

Consultation

There is a strong feeling that before any agreement, even in principle, of siting the project at the BNFL laboratories was reached, full, public and open consultation should have taken place in West Cumbria. Several meetings of the ethics committee on confidentiality, coding and publication of results have already taken place without any input from local parents. The meetings were held behind closed doors with the minutes being kept from public scrutiny.

Public meetings, originally scheduled for June, were finally held on 8 November in Whitehaven (4pm) and Workington (7pm). The main speaker was Professor John Burn from Newcastle University, who, responding to criticism about the independence of the project, said the results would be published whatever they showed: "Perhaps our research will reveal that some people are more susceptible to radiation ... the research might actually help shut Sellafield down." Adding: "It is a gamble by BNFL."

So, how independent is the Westlakes Research Institute, which includes the BNFL Geoffrey Schofield Laboratory? What are the close Sellafield connections many people are concerned about, and how might such links influence the DNA research?

In 1991 BNFL company director Harold Bolter announced a £2.5 million hi-tech development, in the shape of a research institute sited, together with BNFL's new research laboratories, on the Westlakes Science and Technology Park. In his dual capacity as chairman of the West Cumbria Development Fund, which helped fund the £4 million business estate, Bolter promised new investment and creation of local jobs. To date, there is little evidence of extensive non-nuclear investment at Westlakes or of the promised diversification and jobs.

Nuclear companies

Of the firms who have taken residence at the Park the majority are nuclear-related and none have relocated in West Cumbria, their headquarters remaining elsewhere. Unfortunately for West Cumbria, confirmation of this lack of non-nuclear investment was given recently by the leader of Copeland Borough Council, Anne Bennett. Quoting from a report of research carried out by Newcastle University, commissioned by the West Cumbrian Development Agency, she stated that the report showed that, contrary to the notion of BNFL attracting investment into West Cumbria, it does quite the opposite, acting as a deterrent. This report has not been made public.

It is recognised that the need to perceive the Westlakes Research Institute as being 'independent', and having no 'connection' with BNFL, is promoted

strongly in the local media, particularly when an influential BNFL link might be considered insensitive or undesirable, as could be the case with health studies.

At the June 1994 Sellafield Liaison Committee meeting, Professor Steve Jones answered questions from Core on the DNA bank "as a Director of Westlakes Research Institute and not in his normal Committee role as adviser to BNFL." Also in June, Professor Jones was addressing the conference of the Institute of Mechanical Engineers on behalf of Westlakes but the chair felt it necessary to draw the delegates attention to Jones's links with BNFL. During the High Court leukaemia case in 1992, Jones appeared on behalf of BNFL and described himself as being "now the Director of Environmental Research at the Westlakes Research Institute, which is funded by BNFL in Cumbria, and corporate Environmental Adviser to BNFL." Confusing, but useful at times.

Nuclear links

A Westlakes brochure clearly identifies the BNFL interests at the Institute in the form of Director and Management appointments. Westlakes Chairman Dr Gregg Butler is also a member of the BNFL board, whilst Director of the Institute, Professor Roger Berry was until recently BNFL's Director of Health and Safety. Research Director Dr Andy Slovak is also BNFL's Chief Medical Officer and Business Director Tim Knowles is Head of BNFL's UK Group Corporate Affairs as well as being general manager of the West Cumbria Development Fund and Westlakes Properties Ltd, Director of the Northern Development Company and CBI Councillor, all of which give him "an extensive network of political and individual contacts which will be essential for the development of the Research Institute." Graham Smith, Chairman of Westlakes Properties is also Head of Sellafield. Research institute spokesman for the DNA project Dr Duncan Jackson was, until recently, BNFL information manager. Oddly, Professor Jones' connection with BNFL is not listed.

The brochure continues: "It is anticipated that once charitable status has been obtained, the genetics group, housed nearby in BNFL's Geoffrey

Schofield Laboratory, will also become part of the Institute."

Given that Dr Janet Tawn, head of BNFL's laboratory genetic research on Sellafield workers, will also be carrying out genetic investigations on the blood of West Cumbrian babies, it is not surprising that the "independent" label attributed to Westlakes is called into question by the many West Cumbrians who approached Core after the announcement of the DNA project. The proposal has been viewed with great scepticism; many people feel that such duality is totally unacceptable.

Many fear that in the event of genetic damage being discovered in the offspring of nuclear workers — the majority of Sellafield workers' babies would actually be born at the West Cumberland Hospital and included in the study — results damaging to Sellafield might be played down, published in some obscure medical journal and not receive the publicity which they deserve.

Some parents involved in the Sellafield High Court leukaemia cases, who believe radioactive contamination has caused leukaemia in their children, said that research carried out jointly by Westlakes and Newcastle University on behalf of BNFL had been used as evidence against them. With that experience, they are doubtful that future research would be used any differently.

Core understands and shares their concerns and believes that it is unrealistic to expect that the results from an industry-funded research programme, carried out by that industry, would present an unequivocal case against itself.

Clarification

Having publicly raised reservations, particularly on the siting and control of the project, Core has contacted some of the scientists and health officials mentioned in the initial press reports for clarification of the situation and further information.

"Why the West Cumberland Hospital? It is hardly representative of the UK or even Cumbria as a whole, serving as it does a community, a large majority of which consists of Sellafield workers and their families?" In replying, Dr Louise Parker from Newcastle Hospital, said that there was no difference between children from Seascale and Sellafield and those in the rest of West Cumbria. This is exactly what the BNFL newsletter said the company was keen to prove.

Research by the Medical Research Council on genetic damage as a result

of extremely low doses of alpha radiation and reports by Russian scientists of increased cancer risk as a genetic effect of ionising radiation show that there is a need for more research to be carried out. Unfortunately, funding for this work is being cut back, but can we feel comfortable handing it over to the nuclear industry?

Where does the Health Authority stand on this issue? Many people have concerns about the long-standing close co-operation between the authority and the BNFL laboratory, which carries out genetic and amniocentesis tests for them. Dr Joan Munro, Director of Public Health, said in reply to Core's letter: "My personal comments on the ethical issues is that the past research was concerned with samples collected anonymously with no possibility of being traced back to individuals. The proposed project will allow such matching and therefore is of a different nature to previous work, thus meriting wider public debate."

"Is it fair to ask parents to sign consent for their children's genetic material to be stored and safeguarded at a private establishment which has an interest in the outcome of the research?"

Core would agree that the proposed project is different and argues that, whatever the safeguards, tracing back to the individuals will inevitably be a possibility. Enlisting the support of local midwives to obtain consent, who will themselves be co-ordinated by a midwife employed by the project, is not exactly fail-safe. Dating of samples would make it relatively easy to look up the births in official records. There would also be a possibility that Sellafield worker's DNA records, held at BNFL laboratory at Westlakes, could be matched up with that of their offspring.

Core accepts that the goals of screening new-born infants for genetic diseases could be desirable as it is occasionally possible to alter environmental factors to minimise the damaging impact of that defect. But to safeguard confidentiality and our deeply held democratic principles of individual freedom, many of us wonder whether the ethics committee has taken the risk into consideration possible genetic screening for the workplace.

Early this century, for instance, if you had a fair, freckled complexion, you may

well have been turned down for a job in tar or creosote production as it was known that, with constant exposure, pale-skinned workers seemed to be at a greater risk of developing skin cancer. In 1981 a discriminatory policy, operated by the US Air Force Academy, was reversed; until then coloured applicants who showed that they carried a gene for sickle-cell anaemia — sickle-cell trait — but did not have the disease were excluded.

Genetic screening tests could be designed to identify individuals who appear to be more susceptible to occupational hazards — air pollutants, radiation or chemicals — and these could be used to make decision about the hiring and placement of employees.

Caste system

Will these babies being tested over the next few years, whose parents and grandparents make up the majority of the Sellafield work force today, not make up the majority of the Sellafield work force of tomorrow? Taken to the extreme — could we not, considering the possible BNFL privatisation and profit motivation, one day see a caste system of workers, stigmatised by being or not being genetically resistant to radiation? Although possible, it is unlikely that genetic screening would actually be used to make the workplace safer for those individuals more at risk. Is the ethics committee capable, authorised and prepared to take that decision on their behalf? Have we got in place the legal safeguards to protect the confidentiality of screening, information which one day could be shared by businesses, like personal credit rating?

Is it fair to ask Cumbrian parents to take that decision and to sign consent for their children's genetic material to be stored and safeguarded at a private establishment which has an interest in the outcome of the research, rather than a totally independent National Health establishment or the Medical Research Council? Is it fair to involve midwives to get that consent?

We all like to believe that most scientific endeavours serve the best interests of humankind. But the sad truth is that the major users of scientific knowledge today are the military and private industry and, as a result, power and profit are the main motives for acquiring new knowledge.

Would BNFL consider donating its millions — our millions, it is a publicly owned company — to set up a totally independent unit to carry out this particular DNA project? Agreement to do so would calm many fears and allay many doubts. ▽

ENERGY FUTURE

Britain currently has an energy glut, but fossil fuels will become scarce relatively soon. KERR MACGREGOR, senior lecturer in energy engineering at Napier University, Edinburgh, and Chair of the Scottish Solar Energy Group, gives his personal view of a solar future.

Solar energy for survival

IN about one human lifetime from now it is likely that the world will have run out of oil and gas. Between them, they presently contribute nearly two-thirds of global energy consumption and they come in a form which makes them unbeatable for ease of transport, storage and combustion. Unfortunately they are finite. Accumulated from solar energy over millions of years they will effectively have been exhausted over a brief fossil fuel era lasting, at best, a few hundred years. Our solar inheritance will have been spent.

The only other fossil fuel of any significance is coal. According to published energy statistics we have several hundred years of coal left — based on present consumption rates. However, if coal alone were asked to fill the oil/gas gap then its consumption rate would almost triple and its life would decrease accordingly. In addition, though it is now possible to transform solid coal into liquid and gaseous forms, these will be substantially more expensive than the oil and gas we now so easily get from under the land and sea.

The big shadow hanging over coal is its environmental impact. It may be possible to reduce the sulphur and nitrogen oxides — major constituents of the acid rain cocktail — resulting from combustion but, as yet, there

appears to be no prospect of capturing its carbon dioxide (CO₂) emissions which are substantially greater, on an energy for energy basis, than those of oil and gas.

I believe that our children and grandchildren will face such a serious energy crisis that they will need coal as a major energy contributor and that we will need to develop all the best technological tricks that we can in order to minimise its environmental impact. But I don't think it desirable or possible that the world a century from now will be entirely coal fired.

Nuclear power

At this point the nuclear cavalry ride to the rescue. No CO₂, no acid rain, no NOXious smogs, no limit to fuel reserves (provided you can make fast breeders or, better still, fusion reactors work), what more could you ask?

However there are few snags. Nuclear is already one of the most expensive ways of generating electricity. Fast breeders will be more expensive and fusion more expensive still. Despite massive government support and subsidies over nearly half a century now, nuclear's contribution to global energy needs is still a meagre few per cent (between three and five, depending on how you do your sums) and it is improbable, to say the

least, that it could be expanded to the sixty or so per cent which would be needed to replace oil and gas within a century. In addition, with the problems of decommissioning and waste disposal now looming the industry worldwide seems to be generating liabilities faster than power. The oil/gas gap may be serious but I for one do not wish to hand on a legacy of derelict nuclear power stations, fuel stores, reprocessing plants and waste dumps to my successors. Remember that a century from now Torness 1 (the one you can visit today) could still be sitting there decaying and waiting to be decommissioned, alongside derelict Torness 2 and Torness 3.

And now we come to the renewables, and they seem too good to be true. No fuel to run out, no waste, no emissions and very low running costs. The problem is that renewables usually incur rather high capital costs to build and are not therefore generally competitive with non-renewables, at least not in conventional economic terms where external costs such as pollution are omitted. There are some exceptions, notably hydro power which presently contributes about as much as nuclear to world electricity demand and is considerably cheaper. But the big question remains: can the renewable energy sources fill the oil/gas gap a century from now?

DATA ABOUT THE SUN

Age	: Almost 5 billion years.
Mean distance from earth	: 149 600 000 km.
Period of rotation	: 25 days at the equator
Diameter	: 1 392 000 km (109 x the earth's diameter.)
Mass	: 1.993×10^{27} tons. (333 000 x earth's mass.)
Temperature	: 15 000 000 °C at centre. 6 000 °C on surface.
Energy radiation	: 380 000 000 000 000 000 000 kW.
The earth receives	: 170 000 000 000 000 kW.
Total world energy consumption	: 7 000 000 000 kW (1979)

THUS SOLAR RADIATION REACHING THE EARTH WAS 20 000 TIMES GREATER THAN THE WORLD'S TOTAL CONSUMPTION OF ENERGY - EVERY YEAR (1979) !
BECAUSE OF INCREASED ENERGY CONSUMPTION, THE 1990 FIGURE WAS : 15 000 TIMES GREATER.

I don't pretend that it will be easy, but I think that they can and should. I also believe we will have to think very hard about our priorities. There is little point in repeating the nuclear mistakes of throwing most of our resources into an energy source which is going to hit the environmental buffers.

For example, I find wind power an exciting and attractive technology and I think it could be a significant global energy contributor, but I know that, on land at least, it could be quite severely constrained by a shortage of environmentally acceptable sites. Similarly for further hydro power, while the limiting factors for wave and tidal power will be suitable coastal sites.

Solar future?

That effectively leaves solar energy, at least the direct use of solar energy. It has been said that the only thing you can be certain about with energy forecasts is that they will be wrong. However, I will now stick my neck out and predict that a century from now solar energy will be the really big player on the energy field.

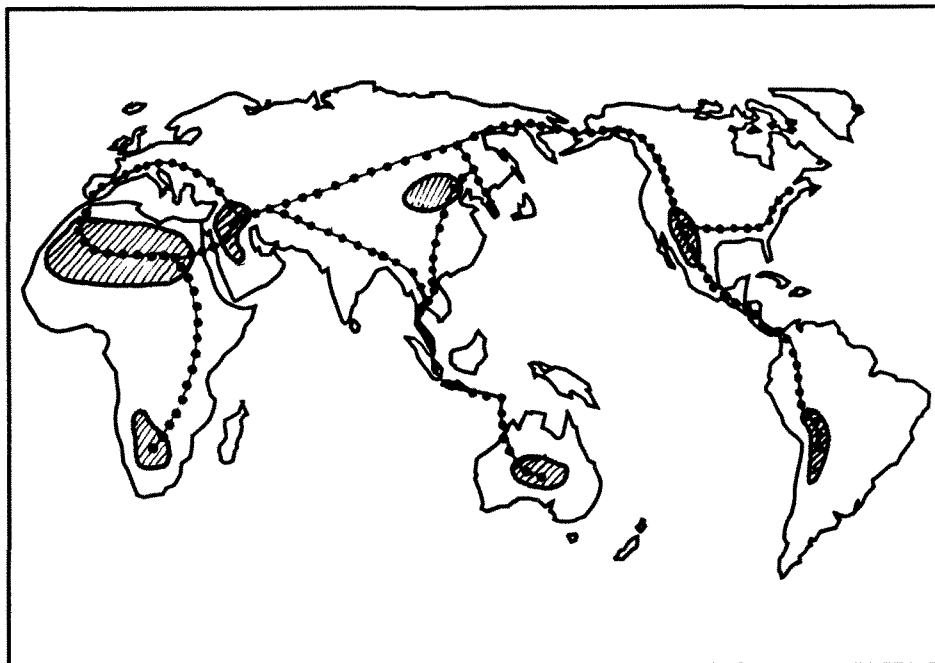
I predict that energy from solar grown biomass material will be a significant contributor to the production of solid, liquid and gaseous fuels for the world. The most serious constraint to its development will come from competition for land from the food crops which will be needed to feed the world a century from now.

I predict that the development of new materials and techniques will mean that local production of solar heat, light and electricity using, for example, the wall and roof surfaces of buildings, will play a major part in reducing the demand for centrally produced and bought-in energy to service our buildings. A reduction of at least 50% is already quite possible with existing technology.

Desert collectors

However, that still leaves a big energy gap, especially with an expanded population. And I am now going to stick my neck really far out and predict that this gap can be filled by solar energy collected from the deserts of the world.

The two key technologies, I believe, will be photovoltaics (PV) — the one-stage conversion of sunlight to electricity using semiconductor



Possible linkage of major solar resource areas

Source: *New renewable energy resources*, World Energy Council, 1994

materials formed into solar cells — and solar thermal power (STP) — the use of high temperature concentrated heat to drive engines and generators.

Both technologies are in their infancy but growing fast. PV, usually based on silicon, one of our most abundant elements, is still expensive and conversion efficiencies are quite low (typically 5-15%), but we have now reached the interesting stage where falling costs and rising efficiencies are leading to increasing markets and production, and therefore to further cost reductions. I think it quite possible that PV could be competitive with electricity from fossil and nuclear fuels within a decade.

“Unless we find an energy source to plug the massive gap left by the disappearance of oil and gas then our survival on this planet will be precarious.”

STP has had less publicity but has actually made even better progress than PV. For example, an Israeli-based company has installed some 300MW of STP plant in California, generating electricity at competitive rates. New developments in low-cost mirrors and durable efficient high temperature absorber materials will, I think, keep STP as the front runner in solar generated electricity well into the future.

The big advantage which solar electricity enjoys is the abundance of desert land, generally quite barren but bathed in sunshine, which is available in almost every continent. Only a small proportion of the world's desert would be needed. For example, a quick calculation shows that 10% of the Sahara covered in PV cells with 10% conversion efficiency could, theoretically, supply the world's present entire energy demand.

Rose-tinted sunglasses

A world powered by solar energy generated in the deserts may well bring social, economic and political problems, particularly since most of the world's remaining oil lies under the desert sands. We will obviously need some clever, but not impossible, new technologies, such as superconductors and a global grid to get electricity to where it is needed without too much loss, and the development of hydrogen as a clean alternative energy carrier and storage medium, but unless we find an energy source to plug the massive gap left by the disappearance of oil and gas then our survival on this planet will be precarious.

You may think that this is merely the dream of a scientist with sunstroke, but I think it entirely possible — provided we have the vision. The challenge is to do it before the oil and gas run out. □

NUCLEAR SECRECY

The UK government and its Whithall civil servants have a whole range of excuses for keeping information secret, from 'national security' to 'disproportionate cost'. LLEW SMITH, MP for Blaenau Gwent and a former MEP, recounts the problems in obtaining details of matters nuclear.

House of shame

ALL governments lie to Parliament. Ironically, I could not say that in Parliament itself. Everything said by Ministers, or indeed any MP, is deemed to be true, because all MPs are 'Honourable' or even 'Right Honourable' gentlemen or ladies. Outside the hallowed halls of our 'Mother of Parliaments' this absurd fiction is seen for the nonsense it is. Within Parliament, MPs are forced into the use of ludicrous euphemisms such as calling a lie a 'terminological inexactitude' — a phrase coined by Winston Churchill.

I spent ten years in the European Parliament (EP) and have been an MP for nearly two and a half years. While I have encountered an obstructionist attitude when trying to gather information for my two EP nuclear reports — prepared in 1988 and 1993 for the Energy and Environment Committees respectively — the secrecy of the British government and nuclear industry dwarfs any problems I encountered in Brussels.

Our Parliament has built into its rules of procedure various agreements and precedents that ensure back-bench MPs are often thwarted in attempts to keep to account government Ministers and indeed quangos and public sector bodies such as those in the nuclear industry.

Veils of secrecy

If you talk to politicians from other European Union (EU) countries, or the US, they are amazed at how secretive the British government and its Whitehall civil service are. When it comes to nuclear matters all the veils of secrecy come down together!

Successive governments have abused parliament through deliberate dissimulation over the establishment of the atomic energy (bomb) programmes in the late 40s, as has been highlighted in Brian Cathcart's recently published book, *Test of Greatness: Britain's struggle for the Atom Bomb*.

Cathcart shows how the infamous admission to Parliament, on 12 May 1948, that Britain had embarked upon an atomic bomb programme was shamelessly manipulated by Albert Alexander, then defence minister in Attlee's Labour government. George Jeger, a Labour backbencher, was not

only primed with his question but also given an appropriate supplementary question to ask.

Jeger asked if the Minister was satisfied that adequate progress was being made in the development of the most modern type of weapon. Alexander replied: "Yes sir. As was made clear in the statement relating to defence ... research and development continues to receive the highest priority in the defence field, and all types of weapons, including atomic weapons, are being developed."

Jeger then asked for "any further information on the development of nuclear weapons." He was told: "No, I do not think that it would be in the public interest to do that."

Cathcart called this a little piece of pantomime, recalling a comment from Dick Crossman in the *New Statesman* in 1963 that this was the kind of question put to "enable a Minister to conceal the true situation while going on record as having made an announcement."

D-Notice

On the same day the Attlee government issued a 'D-Notice' media gagging order, to consolidate the secrecy.

When Churchill was re-elected Prime Minister in 1951, he told Parliament he was "rather astonished" that well over £100 million was spent on atomic energy development "without Parliament being aware of it." However, he wholly commended the expenditure.

In October 1954, Churchill's government decided to build the H-bomb. The following January, the Cabinet decided to make its strategy public, but fearing an adverse reaction, decided to manipulate the announcement. Churchill wrote in a memorandum — released in 1986 under the 30 year rule — that: "The Government would be embarrassed if there was any premature disclosure of this decision," adding "there would be advantages in publishing the Government's programme for civil development of atomic energy before announcing their decision to produce thermo-nuclear weapons."

From its beginnings civil nuclear power was used as a cynical, if convenient, shield behind which to mask military nuclear plans.

Although Churchill's Chancellor, Rab Butler, did try to institute more openness and parliamentary accountability — on the grounds that MPs were bound to ask for more information — his views received a "summary dismissal" from Cabinet colleagues. This pernicious secrecy has bedevilled the nuclear industry through to 1994.

There are many procedural rules and devices — some established by Parliamentary precedent dating back to the middle of last century — that deny MPs, and hence the public, critically important information on a wide range of matters. The real problem, however, lies with the institutional system of Parliament and Whitehall and not the mean or malicious spirit of an uncooperative minister.

Public interest

This can be illustrated by two refusals to answer Parliamentary Questions (PQs). On 12 April 1976, Gordon Wilson asked the Energy Secretary, Tony Benn, what were the current levels of monthly consignment of plutonium from Dounreay to the BNFL plant at Windscale. Benn replied: "It would not be in the public interest to give this information"

In written reply by Benn to Wilson on the same day he stressed that he was "anxious that there should be a wider knowledge and understanding of the facts about nuclear power, including its safety and environmental problems. My officials are considering with other Departments and organisations concerned how the facts can be made more widely known."

Some might note the contradiction between Tony's two replies. This reflects a dynamic tension that was going on in the Department of Energy at the time. Further details on how Benn fought internal battles with his departmental civil servants, and BNFL in particular, to obtain more independent information on Windscale/Sellafield can be gained from his published diaries. Details can also be obtained from a book, *The Secret Constitution*, written by Benn's Parliamentary Private Secretary at the time, Brian Sedgemore.

What both accounts demonstrate is how the civil service try — and often succeed

— in manipulating information available to Ministers, let alone Parliament.

On 25 May 1989, Benn asked the Energy Secretary if he would set out those areas of information in regard to the civil nuclear fuel cycle — from uranium import to the storage of radioactive waste by BNFL — about which it was his policy not to publish full details in *Hansard* for reasons of commercial confidentiality or national security? Michael Spicer, a junior energy minister, replied: "The information supplied on all these matters has to be restricted to some degree for reasons of commercial confidentiality or national security."

These two convenient opt-outs are of course notoriously deployed to keep vast amounts of nuclear industry information secret.

Seven years earlier, one of Spicer's predecessors, John Moore — now Lord Moore and head of the Energy Savings Trust — told a conference of the International Atomic Energy Agency (IAEA), in Vienna, that: "Our nuclear power programme should be an open book, where the public can see for itself that nothing underhand is going on."

We can all agree with those sentiments; the trouble is that the government simply puts secrecy before any open door policy.

Six months after his call for an open door, Moore told Frank Hooley that for reasons of "commercial confidentiality it would not be appropriate at this time to disclose" the source of uranium being sought by the British Civil Uranium Procurement Directorate for the BNFL uranium enrichment plant at Capenhurst.

Not available

Three years later, Robin Cook asked the Department of Trade and Industry (DTI) what the total amounts of uranium ore imported into Britain were and where they came from. Alan Clark responded with a curt: "This information is not available."

Three months later when asked if the DTI would take steps to collect the information Cook had requested, Clark said: "Statistics on trade in uranium are not available for reasons of commercial confidentiality."

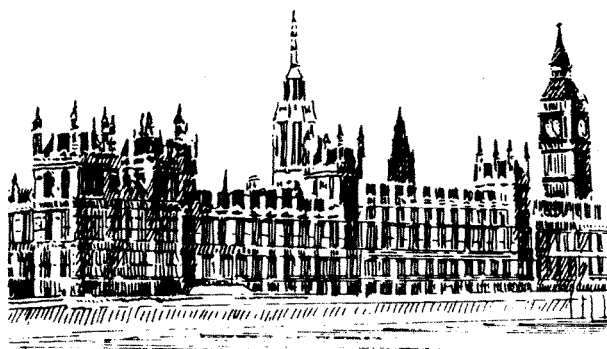
In 1987, Parliament was told that documents relating to the foundations of the UK's civil nuclear programme would be retained beyond the usual 30 years because "disclosures of such documents

would be contrary to the national interest."

It was further informed that details of the cost of research and development of the Magnox and AGR nuclear programmes, and how much of this cost had been borne by the electricity boards was unavailable because it "is not held centrally in the form requested and could be obtained only at disproportionate cost."

The all embracing justification of refusing information on the grounds of disproportionate cost is an insidious one. Even if a further question is put, asking only for information which would not incur disproportionate cost, ministers typically reply: "I have nothing further to add" — even when they have said nothing in the first place.

Although there are nominal guidelines adopted permitting up to £450 per question being spent by a department to answer Parliamentary questions, according to Treasury Minister Stephen



Dorrell, last November, the average cost incurred is £97 for a written question and £225 for an oral question.

Clearly the main reason for declining to respond on the grounds of disproportionate cost really refers to the cost of political embarrassment rather than finance.

When asked, in April this year, about the ten most expensive questions to answer over the last ten years, the Leader of the Commons, Tony Newton, replied: "This information could only be provided at disproportionate cost."

However, in July this year, Newton said that in the last parliamentary year, 11,153 oral questions were accepted for reply and 92,414 for written answer, at a total cost of about £11,473,583, or one-thousandth of the construction cost of Trident!

Put in this context, it is clear the Government, insultingly, pretends it cannot afford the financial cost of preparing answers to some questions. This is a nonsense.

What, the Government was asked in 1987, was the proportion of the total weight of plutonium reprocessed at Sellafield originating from Central Electricity Generating Board installations in the period 1970-85? Sorry: "It would not be in the national interest to disclose this information as this would assist the calculation of plutonium produced for defence purposes." An interesting admission.

Not the practice

Perhaps it would be possible to place in the Parliamentary Library copies of correspondence between the Energy Secretary and the chairmen of the CEGB between 1983 (when the Sizewell inquiry began) and May 1986, concerning the use of plutonium from the UK civil nuclear programme: "No, it is not the practice to publish correspondence between Ministers and the Chairmen of Nationalised industries."

This refusal is contrary to an open door policy, and has been made worse today as more and more parts of the public sector have been sold or hived off into quangos, or non-governmental public bodies as the government likes to call them, the chairpeople of which are not directly responsible to parliament. This is particularly the case with the nuclear industry, despite the massive sums of public money tied up in its operations.

Has the government become more open in nuclear matters in the 1990s — especially since Margaret Thatcher was deposed as Prime Minister? Since being elected to Parliament in April 1992, I have submitted many PQs. As a backbencher, not on any select committee, this is my only opportunity to publicly scrutinise government policies. I can, of course, write personally to ministers, but their replies are not readily available to a wider audience, whereas *Hansard* — where ministerial replies are printed — is available the next day to political or specialist journalists, and is also available in public and academic libraries.

I have had 2,555 written questions accepted for response. I say "accepted" because a significant proportion of questions, especially on sensitive areas — inevitably that includes nuclear issues — have been blocked by the Table Office in Parliament. The Table Office is the 'gatekeeper' office of civil servants who are nominally employed to ensure the questions submitted by MPs are 'in order' according to the rules of Parliament. In my experience the Table Office plays a censorship role, sometimes making

perversely biased judgements in favour of government Departments and Ministers to stop questions being forwarded for reply.

In preparation for a conference on low-level radiation at Newcastle University in 1992, at which I delivered a paper on nuclear secrecy, I tabled a series of questions to find out if government had become any more open on nuclear issues.

I put to Departments questions very similar to ones which a few years earlier they had refused to answer or take responsibility for. For example, in 1986, Robin Cook was told by Alastair Goodlad that he was asking the chairman of BNFL to reply to a question about how much of the depleted uranium stockpile had been re-enriched for British or foreign nuclear programmes since 1956. In July, two years ago, the present Energy Minister, Tim Eggar, replied that "over 15,000 tonnes of depleted uranium from reprocessing of Magnox irradiated fuel have been enriched for use in civil fuel." Progress indeed.

No such progress was found when I repeated the question on publication of correspondence between the chairmen of the nationalised nuclear companies and ministers. Eggar replied: "Further development plans are commercial matters for the companies concerned."

Similarly when asked if the DTI would indicate — without providing any information that would be commercially sensitive — whether or not BNFL or Nuclear Electric had applied to sell any depleted uranium abroad since 1990, Eggar replied: "All export licence applications are commercially confidential. Provision of this information is therefore a matter for the companies concerned."

Decommissioning

Again in 1992, Eggar told me that while it was the responsibility of BNFL to assess the cost of decommissioning the B204 and B205 Magnox reprocessing plants, as well as Thorp, "to the extent that Government programmes have benefited from the operation of the plants, Government will contribute an appropriate share towards the costs of decommissioning."

The Ministry of Defence, responding to a PQ, said that while the UK has "the appropriate expertise and facilities for dismantling UK nuclear weapons withdrawn from service," it was "not in the public interest to give details of the processes involved as they are classified."

The Department of Transport said that the number of nuclear fuel rods flown from overseas by helicopter to Dounreay in each year since 1979 was not available.

The Thorp issue showed Parliament at its best in many ways, as a series of MPs submitted increasingly pertinent questions, putting ministers on the spot. In late June 1993 there was the first Parliamentary debate on Thorp since the spring of 1978, when Parliament gave the project the green light.

One of the crucial issues was whether the plant would be profitable and I asked the DTI what steps had been taken to verify the financial projections made by BNFL. The energy minister said the company had advised him that to abandon Thorp would "cost the country as a whole over £1bn," and that the projection was made "with the assistance of the accountants Touche Ross." He concluded that while he was not in a position to verify every figure, he still considered the methodology "to be sound" and had "no reason to believe the numbers to be inaccurate."

The trouble with such an ingenious approach by a minister of a government that proclaims to be concerned about public expenditure is that it leaves very important financial decisions up to the vested interests of the nuclear industry concerned.

When I asked if he would place a copy of the Touche Ross report in the Parliamentary library — and hence the public domain — he declined: "This is a commercial matter for the company."

Confidential

I pushed the DTI on the subject, asking when BNFL made a copy of the Touche Ross report available to the government and what assessment of its robustness had been made. The DTI stated that: "In view of its share holdings the Department sees a large number of financial and commercial documents from BNFL on a confidential basis ...

"It would not be appropriate to confirm whether particular commercially confidential documents have been made available any more than it would be for [the Department] to disclose the contents of any that have been seen."

Earlier this year, both the Chancellor and the Prime Minister admitted to me that they had not seen the Touche Ross report. It does make me wonder, has any minister at all seen it?

As a final positive example, at the beginning of the year one of my questions to the DTI 'struck gold' in revealing the incredible way the civil and military industries are intertwined in this country.

Over many years various MPs have pursued the question of the number of occasions nuclear materials have been

withdrawn from safeguards applied under the voluntary agreements completed with Euratom and the IAEA as part of Britain's backing for the Non-Proliferation Treaty (NPT) safeguards regime. Full disclosure of these details has always been avoided for "national security reasons." However, this time, Eggar said that under article 14 — the withdrawal clause of the UK/Euratom/IAEA tripartite agreement — "571 advanced notifications of the withdrawal of nuclear safeguards have been made since May 1979."

The reply continued: "The majority of these involved either the temporary withdrawal of material transferred to MOD sites for processing before being returned to safeguards at civil sites, or, in the case of permanent transfers to MOD sites, the withdrawal from safeguards of material such as depleted uranium for source shielding or small amounts of other nuclear materials for analytical purposes."

Diversions

It is clear that some of the 571 withdrawals were permanent, and hence Britain has been involved in legal diversions of civil materials to military use. Greenpeace International used this in a report prepared for the first preparatory meeting for the 1995 review and extension conference for the Non-Proliferation Treaty held in January. The government was obviously not pleased that the UK's Non-Proliferation credentials were being undermined by the distribution to other governments of information it had recently released to Parliament. This is a clear example of persistence paying off in parliamentary probing.

Much of my work at Westminster — and before that in the European Parliament — involves working closely with pressure groups and local elected bodies, in obtaining information not easily available through other channels.

There remain many problems with the disclosure of information by government, Whitehall Departments and notoriously secretive bodies like the nuclear industry.

An MP has certain rights to official information not afforded to the private citizen, above those now provided by the Open Government Code of Conduct on access to Government Information. I intend to continue to seek the truth and disclose secrets the government does not want to release. □

*** This is an edited version of a talk given by Llew Smith MP, to the Nuclear Free Local Authorities' annual conference held in Manchester on 21 October 1994. Copies available from *Safe Energy* for £2.**

Budget moves

VAT on domestic fuel and power will not now be increased to 17.5% in April as planned, but remain at the 8% rate. After defeat for the government on an opposition amendment to his budget proposals, Chancellor Kenneth Clarke announced: "I have decided not to proceed with the second stage of VAT on fuel."

Clarke had earlier refused to take the opportunity of his November budget to cancel the proposed increase in VAT for domestic and charity use despite widespread opposition to the imposition of VAT last April and an improved economic position.

In his budget speech Clarke had announced a compensation package of £1 per week for single pensioners and £1.40 for couples, and an extra £10 million for the Home Energy Efficiency Scheme (HEES). And in an effort to quell the backbench revolt he announced a further £100 million for pensioners and another £20 million for the HEES.

This last-minute move was not enough to win the vote, but though the increased pension money will be clawed back, the increases in HEES funding will stay.

Annual support for HEES will therefore increase to £102.5 million. Andrea Cook, director of Neighbourhood Energy Action, had called for an immediate doubling of HEES funding to £145 million per year.

Under European Union regulations, VAT cannot now be removed from domestic fuel and power, but both Labour and the Liberal Democrats have called for it to be reduced to 5%.

Also included in the budget were a cut of £200 million in the government's road building programme and further increases in road fuel duty, which may have some environmental benefit, but weighed against that is a £300 million cut in rail investment and other cuts in public transport.

Though the prime reason for introducing VAT was to raise government income, it was also meant to cut carbon emissions by 1.5 million tonnes (mt) per year as part of the government's programme for stabilising CO₂ emissions. The VAT defeat, together with the severe underfunding of the Energy Saving Trust — charged with saving 2.5mt of carbon per year — leaves the government's programme in disarray.

The switch from coal to gas for electricity generation and the slower than forecast growth in the economy may be enough to meet the year 2000 target for CO₂ emissions, but a longer-term strategy is

urgently needed if the risk of climate change is to be tackled.

■ French prime minister Edouard Balladur announced in October that VAT on electricity, natural gas and district heat standard charges will increase from 5.5% to 18.6%, the same as that charged on consumer goods. However, the national utilities Electricité de France and Gaz de France, not the consumers, will have to carry the cost of the tax.

■ Dutch plans for an energy tax to promote energy efficiency and provide funding for renewable energy projects may be delayed. The conservative VVD party has proposed that the planned introduction of the tax in January 1996 be put back if the Netherlands is the only country in Europe going ahead with the proposal.

VVD's coalition partners, Labour and the centre-left D66, have reacted angrily to the suggestion, arguing that all parties agreed to the tax whether or not other countries implemented similar measures.

Denmark already operates a CO₂ tax scheme, the Swiss government is planning to introduce one and a new lobby group in Germany, the club for "Ecological Tax Reform", is calling for taxation of energy from non-renewable sources. □

Environment agencies

TWO new environment agencies, one for Scotland the other for England and Wales, are planned by the government to take over the functions of various existing pollution control, waste regulation and river authorities.

The original draft of the bill to establish the agencies, announced in October by Environment Secretary John Gummer, was widely criticised by environmental groups and existing authorities. While the National Rivers Authority in England and Wales presently has a duty to "further conserve and enhance" the environment, the new bodies would merely "have regard to the desirability of preserving" it.

And they were to "have regard to costs and benefits" in exercising their powers, to "minimise the burden on industry".

The weakness in the draft bill is thought to be down to fierce lobbying by Welsh Secretary John Redwood with Treasury and Department of Trade and Industry support.

Following the outcry over his first draft bill, Gummer has responded with proposals for wider powers and a "duty" on ministers to "further conserve and enhance the natural beauty, and of conserving the flora, fauna, and geology or physiographical features of special interest." But these changes are not sufficient for environmental groups which are still lobbying for the bodies to be given wider powers. □

Clean coal prospects

UP to 5,000MW of advanced clean coal generating plant could be installed in the UK early next century, according to a government report.*

Uncertainties in this forecast include electricity demand, fuel prices and the number of new gas-fired and nuclear plants, but there could be a £5 billion market for new coal-fired plant.

In a separate study by the US Department of Energy, the worldwide market for clean coal technology has been estimated at £600bn from 1993 to 2010.

Despite the UK government's pit closure plan of 1992/93, the Department

of Trade and Industry has continued some funding of research on clean coal technology, contributing £40 million to a £200 million programme since 1990.

The programme has three main aims:

- to encourage development of globally competitive industries;
- to increase the potential use of UK coal for industrial and power generation;
- to cut pollution emissions.

The report admits that even if a new commercial-scale plant was ordered tomorrow there would be no increased market for British coal before the end of the century. □

* "Clean coal technologies strategy report" Energy paper 63, DTI.

Carbon sinks

THREE-QUARTERS of Britain's organic carbon locked up in soils and vegetation is in Scottish peat bogs, according to a government funded study by the Institute of Terrestrial Ecology in Penicuik, near Edinburgh.

The estimated amount of carbon in these peat bogs, 22 billion tonnes, is more than twice that previously thought and the equivalent of 100 years of carbon emissions at present rates.

These findings will increase pressure on the government to halt the destruction of peat bogs, and forestry scientists have warned that even tree-planting on peat bogs would in the long run release large amounts of carbon dioxide into the atmosphere.

■ Norway's state oil company, Statoil, has announced plans to bury large quantities of carbon dioxide in the porous rocks of a gas field 1km under the North Sea.

The scheme has been designed to cope with CO₂ from natural gas production. Gas being supplied to Germany from the Sleipner field has a very high CO₂ content which needs to be reduced. If Norway allowed the gas to be discharged to the atmosphere it would increase the country's emissions by 3%. J

Renewables jobs

THE vast employment potential of environmental measures has been highlighted by two recent reports.*

Dr Terry Barker, of Cambridge University, for the Employment Policy Institute, considered the possible effects of a shift in taxation policy from employers' National Insurance contributions to road fuels or carbon emissions. Either option was calculated to create half a million new jobs by 2005.

A study by Friends of the Earth (England and Wales), on the impact on employment of environmental policy, concluded that the idea that environmental protection costs jobs was unjustified. While recognising that there has been a lack of extensive, quantified

research in most economic sectors, the report estimates that a strong environmental policy could create 33,000 to 78,000 additional jobs directly by 2005, and over 700,000 when indirect jobs are included.

Friends of the Earth's report includes a section on the energy sector which shows that investment in wind power could create around 450 jobs per TWh/year and thermal solar 248, compared to 100 for nuclear power.

The findings of these reports may well end up in the party political arena. The Tories have already embarked on a policy of annual increases in duties on road fuels but have also increased National Insurance. The Labour Party's environment policy document published last July ("Labour plans efficiency", *Safe Energy 101*) argued that a switch to environmental spending would create

jobs — though the new, pro-nuclear shadow Trade and Industry team, headed by Dr Jack Cunningham, may see things differently.

The Liberal Democrats are drawing up plans for cutting conventional taxes such as employers' National Insurance contributions, replacing them with taxes on energy sources and materials. And the Scottish National Party has long argued for a renewable energy research centre at Dounreay as a direct alternative to nuclear industry employment. □

* "Taxing pollution instead of jobs" by Dr Terry Barker; Employment Policy Institute.

"Working future? jobs and the environment", Friends of the Earth (England and Wales).

EU R&D

SUPPORT for renewables in the European Union has increased under the Fourth Framework Programme of Research and Technological Development, which was approved on 29 September.

From a total four-year R&D budget of Ecu12.3 billion, energy gets Ecu2.3bn. While more than half of this (Ecu1.3bn) goes to the supposedly mature technology of nuclear power, around Ecu0.45bn will go to renewable energy. Research and development projects receive up to 50% of their costs and demonstration projects up to 40%.

After a shuffling of EU budgets, the Thermie non-nuclear energy demonstration programme (Ecu134m) is now included in Science, Research and Development alongside the Joule programme (Ecu220m). It is also possible that the Energy Directorate will launch an extra Thermie sub-programme within the energy

budget, particularly for the dissemination of information.

Projects on the rational use of energy will get Ecu0.27bn and solid fuel and hydrocarbons Ecu0.28bn.

The increased support for renewables backs up the Altener programme, established in 1992 to promote renewables, which set targets for renewable energy generation within the EU, including 8,000MW of wind by 2005; there is currently around 1,400MW of wind power installed in the EU.

■ A directive is to be published by the European Community by the end of 1994 requiring electricity distribution companies to consider energy conservation as an alternative to buying in new supply sources.

Originally planned for last January, the proposed directive on integrated resource planning has met with fierce opposition from the electricity generating industry. But a commitment to proceed with the plan was drawn from the new energy commissioner, Marcelino Oreja, after some hostile questioning by the European Parliament energy committee. □

Energy charter

AFTER three and a half years of negotiations, a final draft of the European Energy Charter, for developing the energy resources of the former USSR, is due to be signed in Lisbon on December 17.

Over 50 countries are being asked to approve the Charter, but the US has said it cannot guarantee that the provisions can be made binding on its state governments and may not sign.

The Charter covers hydrocarbon fuels, integration of electricity and gas grids, energy trade and transit rules between West and East Europe, and modernisation of East Europe's nuclear plant.

Germany, which holds the European Union presidency until the end of 1994, is keen to see the Charter signed by all 50 countries.

Amongst the benefits offered by the Charter are a possible energy saving in Russia of 40-60% and a reduction in the estimated 10-40 billion cubic metres of gas lost annually through leaking pipelines and flaring. □

Wave boost

SHORELINE wave power development in the UK, denied funding by the government, has had an eleventh hour reprieve, writes David Ross.

Plans by Professor Trevor Whittaker of Queen's University, Belfast, for a follow-up to his successful shoreline demonstration plant on Islay looked doomed when the Department of Trade and Industry cut off funding for wave power last March ("Wave set-back", *Safe Energy 100*). Without financial support from government or industry Whittaker was unable to receive a £425,000 grant for matching funding from the European Union (EU) Joule programme.

While the government was not prepared to back Whittaker, his work was recognised by the scientific community, with the prestigious Royal Society awarding him the Esso medal "for outstanding contributions to the advancement of science or engineering or technology, leading to the efficient mobilisation, use or conservation of energy resources."

At the award ceremony on 24 November, Whittaker surprised the audience by announcing: "I have just signed a contract with Brussels and the second plant is under way." His saviour is Applied Research and Technology of Inverness, developers of the ART Osprey near-shore wave power device, which has also secured EU funding for its project

thanks to financial backing from several large companies, including GEC and British Steel.

This news added further to the discomfort of the guest speaker, Tim Eggar, the Minister who had pulled the plug on wave funding back in March. Eggar was sufficiently embarrassed by events to check that there would be no questions after his speech.

■ The ART Osprey prototype, which was due to be installed off Dounreay in September, has been delayed until various authorisations are obtained. Deployment is now expected when there is a suitable weather window in Spring 1995. In the meantime, ART is working on various efficiency improvements to the Osprey. □

Renewables Orders

AT the time of going to press, announcement of the first Scottish Renewables Order (SRO 1) and the third Order of the English and Welsh Non-Fossil Fuel Obligation (NFFO 3) had both still to be made.

In Scotland 139 projects, totalling 331MW declared net capacity (DNC), reached the final bidding stage of SRO 1. Included in this is around 250MW (500MW installed capacity) of wind power, hydro-electric and energy crops at below 6p/kWh — representing a potential capital investment of £0.5 billion. However, contracts will be awarded for only 30-40MW (DNC) of capacity.

The Scottish Office was due to have reached a decision on successful projects in October 1994, but has offered no explanation for the delay.

Scottish Office Ministers are expected to follow recommendations made by the electricity regulator, Offer, with selection being made only on the basis of bid price. This would result in 15 hydro schemes totalling 17MW, 12 wind projects (45MW) and two landfill gas (4MW) being awarded contracts. The bid prices for these projects are all 4.2p/kWh or less. Offer expects a completion rate of about 50% for wind power and 80% for hydro

and landfill gas, which Offer expects would give a total declared net capacity of around 35MW.

It is possible that the lowest bid projects in the waste and energy crop technology bands will also be included but with bid prices of around 5.0p/kWh and 4.8p/kWh respectively. Offer cautions that this would cost electricity customers about £21 million over 15 years in addition to around £44 million to £54 million for the lowest bid projects.

The role of the electricity regulator in the renewables orders' process is unfortunate. Offer has been responsible for assessing bids on the basis of technology, economics and planning — the 'will secure' test. But its recommendations to the government are far more to do with its job as electricity watchdog committed to keeping down costs for customers. Its logic is that it would rather not see any renewables introduced until they are cheaper than conventional generation, conveniently ignoring the fact that the NFFO and SRO are aimed at promoting the development of technologies so that they become economic.

Offer has been criticised for not being sufficiently rigorous with its 'will secure' assessment. Though 50 projects were excluded from the final stages, 22 were withdrawn by the applicants and another eight were too big. No projects were

thrown out on the basis that they were in unsuitable locations unlikely to gain planning permission.

The concentration on costs rather than environmental impact needlessly undermines one of the main aims of the SRO — generating electricity in a more benign way.

In England and Wales 520 projects totalling 2,464MW (DNC) are competing for NFFO 3, which will be for 300-400MW.

Advice from the electricity regulator Offer would, if accepted by Ministers, exclude hydro and energy crops with minimum prices of 4.3p/kWh and 4.9p/kWh, respectively. Offer suggests two options for selection: minimum cost or price convergence — which takes account of bid prices by technology band in NFFO 1&2. In either case, the Order would be swamped by waste to energy and landfill gas projects; wind power would get just 11MW of effective capacity at a marginal bid price of 4.0p/kWh under 'minimum cost' or 93MW at 4.5p/kWh under 'convergence'.

It is thought that Offer's advice will be less fully accepted in England and Wales. It is known that Energy Minister Tim Eggar is a strong supporter of biomass, and the exclusion of energy crops from NFFO 3 would not be to his liking. □

Wind guidelines

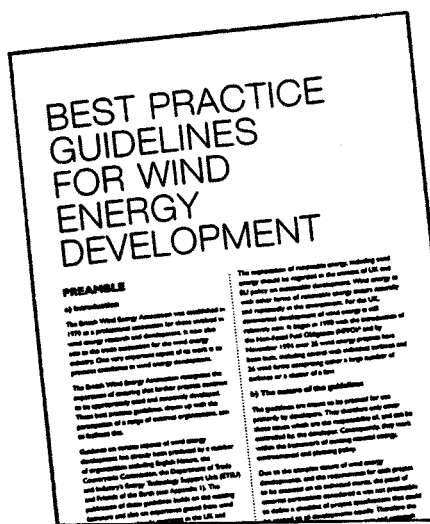
GUIDELINES for best practice in wind energy development* have been drawn up by the British Wind Energy Association (BWEA).

In part a response to vociferous opposition to wind power from groups like Country Guardian and unfavourable press coverage, BWEA — the wind industry's trade association — decided in July 1994 that guidelines should be produced.

BWEA involved a wide range of organisations in the process, including the Royal Society for the Protection of Birds, Scottish Natural Heritage and the Countryside Council for Wales, as well as international environmental groups and specialist agencies.

The guidelines are designed to "provide clear guidance on the environmental and planning issues that should be considered for wind energy projects and the dialogue that should be undertaken." Though directed at wind energy companies they should also be of interest to local authorities and local communities.

One of the earliest tests of the effectiveness of these guidelines may come in Scotland. BWEA member National Wind Power (NWP) — 67% owned by electricity generator National Power — is rumoured to have succeeded with half a dozen wind farm applications to the Scottish Renewables Obligation.



NWP was the developer most criticised by the Welsh Affairs Committee in its recent review of wind power ("Welsh wind report", *Safe Energy 101*), which reported that developers "had not always been sensitive to local concerns and on some occasions has given every impression of riding roughshod over them."

■ BWEA has also produced a leaflet *Wind energy — the facts* which summarises the potential for wind power, the environmental benefits, local views and the economics. □

* "Best practice guidelines for wind energy development", BWEA, November 1994 (Tel. 071 404 3433).

Solar developments

THOUGH rarely in the headlines, solar power continues to make steady progress towards wide-scale economic applications.

Developing countries with an abundance of sunshine but poor electricity supplies are providing a growing market for photovoltaics (PV). And in several European countries the use of PV panels and solar heating are being promoted.

The Danish government has launched a press advertising campaign offering 30% grants for solar heating. In Essen, Germany, an estate of 25 houses has been equipped with PV panels by RWE Energie, the country's largest electricity generator.

Longer-term developments include work on reducing the cost of PV cells by using cheaper, less pure materials, and attempts to mimic the photosynthesis process by which plants capture solar energy.

■ A non-party political pressure group, Eurosolar, is setting up a UK branch with a formal launch on 28 February 1995 at the House of Commons. The group, which aims to "advance every kind of renewable energy that is powered by the sun and that does not damage the environment, can be contacted c/o Frank Cook MP, 1 Parliament Street, Westminster, London SW1A 0AA (Tel 071 219 6874). □

REVIEWS

Unlawful Killing: The murder of Hilda Murrell; by Judith Cook.

Bloomsbury; 1994, 200pp, £16.99 (hb).

Ten years ago Hilda Murrell was murdered. She was 79 and a retired rose grower. Her body was found half-naked, with superficial injuries, in a copse 6 miles from Shrewsbury.

In *Unlawful Killing*, Judith Cook revisits the scene of her previous book "Who Killed Hilda Murrell?" with the help of many people who have investigated the perplexing and so-far unsolved mystery of Hilda Murrell's murder.

According to the police Murrell was the victim of an opportunistic burglary that had gone "tragically wrong." However, events suggest otherwise. Why would a simple burglar disconnected the telephone and then waste considerable amounts of time pouring through her files and papers? Why after being discovered would he be panicked by a 79-year-old woman into acts of extreme violence? And, what about the evidence of "sexual activity": the thief had masturbated on some clothing? Why would he then put Murrell in her own car and proceed to drive round town allowing no less than 69 people to see the car being driven erratically?

Why would the police change their story: originally they said the telephone had been expertly disconnected, later they claimed it had been yanked out of the wall; they also said she had been sexually abused, changing their story afterwards to saying there were signs of sexual activity?

Who was Hilda Murrell? She was a quiet lady who had long since retired from the family rose growing business, a woman who had studied medieval languages at Cambridge. She was the very picture of an English country spinster — what offence could she possibly cause?

Two things mark her out and hurl her into the murky world of the secret services. First she was passionately anti-nuclear and was due to present evidence to the Sizewell public inquiry. Some believed she had new and damning information, a belief strengthened by reports of a telephone conversation that she had, two months before she was killed, with Gerard Morgan-Grenville of Ecoropa, which she ended by saying: "If they don't get me first I want the world to know that one old woman has seen through their lies."

Was she becoming paranoid? It has since emerged that Sizewell objectors had been under surveillance by a private security firm called Zeus Securities, the client is widely believed to have been MI5. Zeus subcontracted the work to another agency who in turn employed a man known as Vic Norris or Adrian Hampson. Norris/Hampson was a convicted child abuser and was known to have links with Nazi organisations.

Second, her nephew, Commander Rob Green, played a central role in naval intelligence during the Falklands 'conflict', at the time the Belgrano was sunk while fleeing back to Argentina, not as the Government first claimed heading towards the British task force. The prime minister, Margaret Thatcher, had been extremely embarrassed by the leaks of naval intelligence that had forced her to change her story. Green had retired after the Falklands Crisis, and had to be a suspect for the leaks. However, Cook comments that no-one seriously believes that Green was the source of the embarrassing leaks. Murrell was down on his naval records as next of kin.

That's two reasons for the security services to take an

interest in this quiet, retired rose grower. Yet, the services say they have never heard of her, nor have they investigated her. Hard to believe.

What emerges in the rest of the book exposes the many holes and contradictions in the official story, and points to the opinion that Murrell was indeed victim of something which went tragically wrong, but not a simple burglary. What seems more likely is that Murrell disturbed a team of so-called freelance operatives for the secret services who panicked and killed her. Cook provides considerable documentary evidence for this and details the many attempts at cover-up by the 'establishment'.

A decade on, the mystery of Murrell's murder remains unsolved. Perhaps we will have to wait until the day the files of the British secret services are thrown open to the public in the way a mass of classified information is now coming out of the files of the former Soviet Union's KGB.

Cock-up, conspiracy or simple burglary, Cook's well researched and written book presents a depressing vision of civil rights in Britain and of British democracy in action.

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REVIEWS

Rebuilding Romania — energy efficiency and the economic transition; by Walt Patterson.

**The Royal Institute of International Affairs/
Earthscan; 1994, 203pp, £12.95.**

This is a fascinating account of a study into the role energy efficiency could play in reviving the Romanian economy and improving the quality of life. Walt Patterson, who initiated and led the study, is to be congratulated on his approach. He took the time to learn the language, forged close friendships with Romanian colleagues, learnt some of the culture and history of the country, and understood that solutions could not simply be imported blindly from the West.

As Dr Michael Grubb states in the preface: "Walt Patterson has broken new ground not only in aspects of the subject matter, but perhaps more widely concerning approaches to energy policy research in the region."

What, for me, weakens Patterson's generally excellent study is that on travelling east one item of Western baggage he did not leave behind was the belief in the omnipotence of the free market. Discussing the isolationist approach of the Ceausescu era Patterson states: "In principle, to be sure, an 'island economy' could function perfectly well, given adequate internal resources and an effective market economy to establish their value." It is the idea that something's only value is that put on it by the market that has allowed Western countries to ravage the environment in search of profits. And that is in no way mitigated by the fact that the environment has fared even worse under the centralist rulers of Eastern Europe.

The first few chapters, probably reflecting Patterson's own approach, look at the history and present position first of the country as a whole and then specifically at the energy sector.

For most Westerners

Romania is inextricably linked to the vivid images brought to us on our TV screens of the violent scenes surrounding the downfall of Ceausescu, and of the horrific sight of the country's slum orphanages. A much fuller, more rounded picture of Romania is to be found in the first two chapters of this book.

The story of Romania since the 'events' of December 1989 — the 'revolution' to those outside the country — is similar to other east European countries adjusting painfully to

country producing petroleum commercially in 1857, two years before what is generally regarded as the start of the petroleum era with the Drake oil strike in Pennsylvania, USA.

As well as oil, Romania has reserves of gas, coal, lignite and hydroelectricity. There is also considerable potential for small-scale hydro, geothermal, solar, wind and biomass: Romanian specialists estimate that renewables will contribute 5-10% of primary energy need by 2020. Hydro already supplies 2.6% (1991 figures) of Romania's energy and 67 new hydro stations are currently under construction which will bring this up to around 3%.

In assessing the prospects

mining rock as well as coal.

On the positive side, Romania already operates a form of demand-side management, and was the first of the emerging democracies in central and eastern Europe to designate a government body explicitly dedicated to energy conservation.

Many of the recommendations from the study — which Patterson is keen to point out was not his alone but also that of the Romanian experts involved in the process — will probably be familiar to *Safe Energy* readers; it is the circumstances in which they are to be applied that are unusual.

Not surprisingly given the state of the country's economy, no-cost and low-cost measures, energy audits and the supply of accurate and accessible information are considered priorities. And given their run-down state, investment in buildings, district heating systems, and many industries should show a quick return.

Patterson concludes that "Romania has the resources and the skills to become again a stable and prosperous member of the international community." Promoting energy efficiency could accelerate the process.

This really is an excellent book — also published in Romanian — which it is hoped will involve more non-Romanians in Romania, and involve more Romanians in energy issues, especially energy efficiency. "It aims to stimulate interest in the potential for improvements, and to encourage both Romanians and non-Romanians to take advantage of the opportunities."

And finally, after my review in *Safe Energy* 101 of Patterson's book "Power from plants" by the same publishers, I must point out that this book is furnished with an index. A move which I hope will be continued in future RIIA publications.

GRAHAM STEIN



Pete Sonderskov, *The Economist*

post-communist life. The prices of basic foods and fuel have soared, industry has collapsed even further, and there are a lack of resources for rebuilding the crippled economy.

Because of the slower pace of reform in Romania, it is behind countries like Poland, the Czech Republic, Slovakia and Hungary in the queue for foreign investment, making its transition even harder.

Romania is, however, "singularly endowed both with a profusion of energy resources and with long experience in their development." Until the 1980s, Romanian engineering had an international reputation for excellence. Romania was the only

for energy efficiency measures, one of the biggest problems facing Patterson and the team of Romanians is that though there is no shortage of energy data from the Ceausescu era it is unreliable. Patterson recounts that when a foreign visitor asked a Romanian energy specialist to explain the discrepancy between two graphs, which showed that power station emissions were at their lowest in the mid-eighties when output was at its highest, he answered "It's a lie. We were told what numbers to report."

Another example comes from the coal industry. Coal mines, struggling to meet ever increasing production quotas, met their targets by

LITTLE BLACK RABBIT

Phil Gallie MP



Back in *Safe Energy* 101, Little Black Rabbit reported on Tory MPs in the pay of electricity companies. Phil Gallie, who represents Ayr constituency, receives an annual payment from Scottish Power and a company car, but his silence over the utility's plans for 65km of electricity pylons through Ayrshire was thought to be purely coincidental.

However, Gallie has now told *Scotland on Sunday* that: "Economically, I would argue in favour of the link [pylons], but I have deliberately not done so. If anything my Scottish Power link [financial] has stifled my contribution in an area like that."

So, for the record, Scottish Power pays Phil Gallie an annual fee which prevents him speaking out in its support when it faces wide-spread opposition at a public inquiry. Good value for money there then.

Country Guardian 1



The recent report on wind power by the House of Commons Welsh Affairs Committee ("Welsh wind report", *Safe Energy* 101) was highly critical of the accuracy of evidence against wind power presented by the Countryside Council for Wales (CCW), the Campaign for the Protection of Rural Wales (CPRW) and Country Guardian.

CCW was strongly criticised by the Committee: "We found the casual approach of CCW witnesses to inaccuracies in their evidence ... quite unacceptable from a publicly funded organisation." Country Guardian was told that its arguments "are not assisted by being associated with inaccuracies and misrepresentations of many of the technical issues." And of CPRW evidence, the Committee said it "seriously undermines the standing and reputation of the CPRW that it is prepared to base its policy on such exaggeration and misinformation."

As well as all being lambasted by the Welsh Committee for the inaccuracy of their anti-wind evidence, the trio have something else in common: CCW and CPRW both got technical advice from Geoffrey Ratcliff, a Country Guardian activist.

... 2 ...



Country Guardian has also been embarrassed by the Centre for Alternative Technology's *Clean Slate* magazine publishing a quote from a former director of Country Guardian, Eddie Wren:

Our organisation has nothing to do with conservation. My mandate is to oppose all wind turbines. The people who pay me are not interested in looking after the countryside, only to stop wind power.

... 3 ...



Neil Kinnock, former leader of the Labour Party and now a European Commissioner, has become a bedfellow of Margaret Thatcher's former Press Secretary Sir Bernard Ingham. A paid adviser to the nuclear industry, Sir Bernard is vice president of Country Guardian, and Kinnock has now joined him as a patron of the organisation.

LBR assumes that Neil's wife Glenys, recently elected as a Euro MP, is less than pleased with her husband joining the anti-wind lobby for she is a patron of the Centre for Alternative Technology, a keen promoter of wind power.

... 4



In the running for the most tasteless press release of all time is Country Guardian's response to the issuing of guidelines for wind farm development by the British Wind Energy Association.

With Neil Kinnock's name alongside Sir Bernard Ingham's on the headed paper, CG declared:

Best practice guidelines for wind farm developers are like a best practice guide to child abuse.

Down in the dumps



Nirex, charged by the government with finding an answer to the problem of growing quantities of low and intermediate-level waste, took years to come up with the inspired idea of digging a huge hole under Sellafield and filling it with radioactive waste.

Because, for some reason, doubts

have been expressed about the safety of the 'repository', Nirex called in eight top scientists from the Royal Society to endorse its *dumpum subterraneum et forgetum*.

However, this PR stunt backfired at a press conference when the enthusiastic scientists came up with the idea of chucking high-level waste into the cavern as well. Nirex has always sought to placate Cumbrians by insisting that its dump would definitely only be for lower-level waste.

Labour pains



Anti-nuclear groups are seriously alarmed by Tony Blair's recent reshuffle of his shadow cabinet. Chris Smith, who told *Safe Energy* (101): "Labour will not allow any new nuclear power stations to be built," has been moved from the influential post of Environmental Protection (though admittedly to be replaced by the similarly minded Joan Ruddock), while pro-nuke Martin O'Neill remains at Energy.

The real horror comes with the new Trade and Industry team — responsible for energy policy. It is headed by the infamous Dr Jack Cunningham, MP for greater Sellafield, and at least three of his four juniors appear also to support nuclear power. The only possible exception is Nigel Griffiths, whose current personal views on this are unknown, but who — many years ago as a young and enthusiastic Edinburgh Councillor — withheld some of his electricity bill as part of a consumer protest against nuclear power.

With Labour's energy policy due to be produced soon, we may find Chris Smith's commitment to have been extremely short-lived even by political standards.

Labour pain



Giving further succour to the nuclear industry is George Adam, a Labour MEP and vice chair of the European Parliament's Energy Committee. Quoted in the nuclear industry magazine *Nuclear Forum*, Adam states: "We should never forget that the anti-nuclear people are anti-industry and anti-progress." Comments on a postcard to George Adam, MEP, European Parliament, Strasbourg, France.