

SCRAM ENERGY BULLETIN



THE SCOTTISH CAMPAIGN TO RESIST THE ATOMIC MENACE, 2 AINSLIE PLACE, EDINBURGH. 031-225 7752

No. 3 DECEMBER/JANUARY 1977-78 10p

INSIDE THIS ISSUE

- * Wavepower
- * Nuclear Power and the Trade Unions
- * Solar Power in the City
- * News and much more.....

SAVE IT... OR SELL IT?



The South of Scotland Electricity Board has recently launched a £400,000 public relations campaign in order to try and persuade the Scottish public of the 'benefits' of electricity, in particular of nuclear electricity. One third of the money is being spent on press, TV and radio advertising.

With government exhortations to "Save It" and gloomy predictions of an "energy gap" before the end of the century, the public could be forgiven for believing that the priority in Energy Policy was to save it rather than to sell it. The SSEB's campaign, however they try and defend it in terms of "providing information", is a concerted attempt to sell more of their product - electricity. Consumers would do well to question whether their money is being well spent.

But then the SSEB has its own problems to solve. As a result of their greatly over-estimated demand forecasts in the 1960s, they built too many power stations. Thus they have a rather embarrassing surplus capacity of supply. In 1976-77 the maximum demand was for 4,307 MW, whereas the total available capacity was as much as 7,183 MW. In addition there is a further 1,320 MW due to come on stream within a year from Inverkip. Even allowing for the normal

Digitized by (over 17.)



The site at Torness, East Lothian.
Will it remain untouched?

TORNESS

The revelations in our last Bulletin concerning the plans to build a nuclear power station at Torness, East Lothian, caused quite a stir.

Readers will remember that we had ascertained that the SSEB does not in fact have permission to build the type of nuclear reactor at Torness which the government is likely to choose for its next nuclear programme and that, when the government does opt for a reactor type, the Secretary of State for Scotland will have the option of calling a new public inquiry.

This does not mean, as some have unfortunately construed it, that there is bound to be an inquiry. Far from it! It will take a great deal of public pressure to convince Bruce Millan that there is sufficient concern to re-open the question of Torness.

When the government announces its reactor choice (before Christmas?), SCRAM will be issuing a circular giving reasons why Torness should be the subject of renewed public scrutiny and urging people to write expressing their views to their elected representatives. It will be coming your way if you are one of our subscribers.

safety margins and for the electricity exported to the North of Scotland (accepting for a moment a general policy of export), this is too high by at least 20%. Any, albeit artificial, stimulation of the market can improve the situation. Hence the high advertising budget.

In any case, there is good reason to suggest that the role of electricity in any rational energy strategy has been much exaggerated. Electricity is of course an invaluable source of energy for certain very noticeable uses, such as TVs, stereos and lighting, but for the majority of our requirements, which are in the form of low-temperature heat (mostly space-heating), electricity is an expensive and wasteful source.

You are using a very high quality supply, inherently inefficient in production (power stations can be no more than about 30% efficient), to meet a very low quality need. You are using a sledgehammer to crack a nut. It would make much better sense to use District Heating Schemes, solar collectors, central coal boilers or gas to heat our buildings, and conserve electricity for those purposes for which it is specifically needed. Such a policy the SSEB would find hard, if not impossible, to swallow.

Their familiar enthusiasm for nuclear power is particularly pernicious. In the face of mounting public disquiet, the SSEB is trying to improve the battered nuclear image. Whether nuclear electricity has been, or will be, comparatively cheap is a matter of continuing controversy (it seems to depend on who does the sums), but in the last resort it is irrelevant. For it is the environmental, social and political costs that are worrying people and these may well overrule simple economics.

How do you cost the dangers of long-lived radioactive waste? What price freedom of information in a plutonium economy? What price death in, or life after, a nuclear war?

"NUCLEAR POWER NO THANKS"

A summary of the case against nuclear power and a consideration of the alternatives. 32 pages. Produced by Friends of the Earth Cambridge. Available from them or from SCRAM at 25 pence.

(postage extra)

---o0o---

DEATHS AT WINDSCALE

On November 15th, awards of £22,441 and £8000 were made in the High Court in Carlisle to the widows of two plutonium workers at BNFL's Windscale plant.

For more than 4 years, the General and Municipal Workers Union has been fighting for Mrs. Gladys Troughton and Mrs. Joan King, who were claiming damages against BNFL.

The length of time which it has taken for these cases to be resolved highlights the difficulties inherent in attributing death or illness to radiation suffered at work. Indeed, while in the case of Mr. Troughton it was concluded that on the balance of probabilities the myeloma (a form of cancer) from which he died was caused by radiation, in the case of Mr. King (who died of a brain tumour) expert opinion was divided as to whether his tumour was radiation-induced.



WINDSCALE

It is a matter of concern that it has taken so long for these cases to be resolved. BNFL were understandably proud of their claim that no deaths attributable to radiation have occurred in the UK - but they will no longer be able to claim this. Public fears will only be heightened by their apparent reluctance to admit responsibility.

Since the workers at Windscale are the sector of the population most at risk from radiation, it is to be hoped that BNFL will be encouraged to tighten up their safety standards. It is also important that monitoring of health is not confined to workers at the Windscale plant but is extended to all those who have worked in the plant in the past. Such monitoring is only now beginning to be undertaken.

SCRAM & the UNIONS

In general, one gets the impression that the majority of trade unions probably favour nuclear power, believing the professional experts' claim that what exists today is a clinically clean industry necessary both for jobs and for further industrial development.

It is a picture which is understandable because of the very complexity of the subject, the nature of our closed society and the secrecy surrounding the industry due to its origins in the manufacture of the bomb.

However, in the experience of the Dumfries and Galloway branch of SCRAM, the picture is not wholly a pessimistic one. When trade unionists have been presented with views of the "other side", common sense has prevailed and a progressive stance has been taken by local trade unions against the nuclear menace.

Bill Stout, a prominent member of SCRAM SW and of the Dumfries Labour Party, here describes the nuclear debate within Scottish Trade Unions.

For example, the Dumfries and Galloway branch of the National Association of local government officers, with 850 members and forming part of the fourth largest trade union in Britain, successfully had a motion carried by the Scottish Trade Union Congress at the 1977 annual conference. In addition, the local branch had two amendments to motions on the nuclear energy programme accepted for debate at their own annual conference.

Both motions expressed concern at the harmful implications of the nuclear energy programme as detailed in the Flowers' Report and called for a ban on it by the Secretary of State and urged the development of research on other energy sources.

Locally too, the Transport and General Workers Union initiated a motion condemning the dumping of nuclear waste in the Galloway hills. This was then adopted at the TGWU Scottish level and then presented to the STUC.

Paradoxically, both unions at the national level at the 1977 STUC then supported a motion for the development of the commercial fast breeder reactor! The STUC, recognizing the contradiction of having on the one hand accepted a motion against the dumping of nuclear waste and on the other of having accepted a motion in favour of the FBR, then referred both motions to the General Council. This paradoxical situation is an interesting one for us all, for the acceptance of both motions was not the result of the anti-nuclear lobby opposing the pro-nuclear lobby, but rather the result of immediate evidence being presented and then accepted.

Had there been a prolonged debate on the issues, a very different situation might have resulted. As it was, the anti-nuclear case against the FBR was weak and fragmented and no convincing evidence was presented for alternative energy forms. But it was not so locally in the Dumfries and Galloway region. Thurso Trades Council had made a request at the beginning of the year for support from the Dumfries district Trades Council for a CFBR to be built at Dounreay - their request having been endorsed by the STUC. At their first meeting, the instinct of the Dumfries Trades Council was to support the STUC recommendation. However, at the request of a SCRAM trade union delegate, the Trades Council decision was postponed until SCRAM's case had been heard. An unusual enough event, in that SCRAM was not a trade union and the Dumfries Trades Council was not in the habit of hearing non-trade union evidence against another Trades Council seeking its assistance. Following the presentation of evidence by a SCRAM speaker, the Dumfries Trades Council unanimously condemned the CFBR.

Following a talk to the Dumfries branch of the National Union of Railwaymen on the transportation of nuclear material - again by a SCRAM member - the railwaymen expressed deep concern and called upon their national executive to be especially vigilant on their behalf. The NUR for the South West of Scotland has publically condemned nuclear dumping and has given support to SCRAM.

Clearly SCRAM has a long way to go to win over trade unionists, especially at the national level. The Windscale Inquiry and its report in the mass media is beginning to show that there is one common point to the arguments - the need for more information.

I believe that the Dumfries and Galloway branch of SCRAM has shown that information can be disseminated and understood; and when this has been done, trade unionists have adopted a positive and progressive anti-nuclear stance.

POWER FROM THE WAVES

Recently, and particularly in the UK, power from ocean waves has been identified as a potential source of very large amounts of energy. Its attractions have been widely celebrated and it has been suggested as a partial alternative to the Breeder Reactor in future energy policies. The suggested technologies, although relatively simple, are untried on a large scale and the layman may be forgiven for reserving his enthusiasm. Ecologists, although sympathetic to the use of recurrent energy sources, may be apprehensive of the envisaged scale of Wave Power installations. They may also wonder why governments are sympathetic toward Wave Power research at the apparent expense of wind, solar and tidal power. Advocates of nuclear power, jealous of their research budgets, mutter about Bolshevik plots.

This article is an attempt to put the attractions of Wave Power into perspective.

THE ENERGY GAP AND FUTURE ENERGY POLICIES

Most authorities agree that world stocks of oil and gas will be unable to meet even the present demand for more than another 20 or 30 years. Long term commitment to conservation of these fuels, which at present contribute about 2/3 of this country's primary energy needs, seems unlikely. Moreover, they will have an increasing value as chemical feedstocks to industry. The need for alternatives is obvious; the question is what kind?

In "Fuel's Paradise", Peter Chapman of the Open University's Energy Research Group, describes three possible energy policies :

- 1) Business as usual, involving continuing devotion to exponential growth fuelled ultimately by the Breeder Reactor;
- 2) Technical fix, a middle path of slow expansion using a mix of new and existing energy sources, including nuclear power;
- 3) Low growth, a non-nuclear future with maximum use of solar energy and waste industrial heat, leading to virtual national self-sufficiency at the cost of reduced living standards.

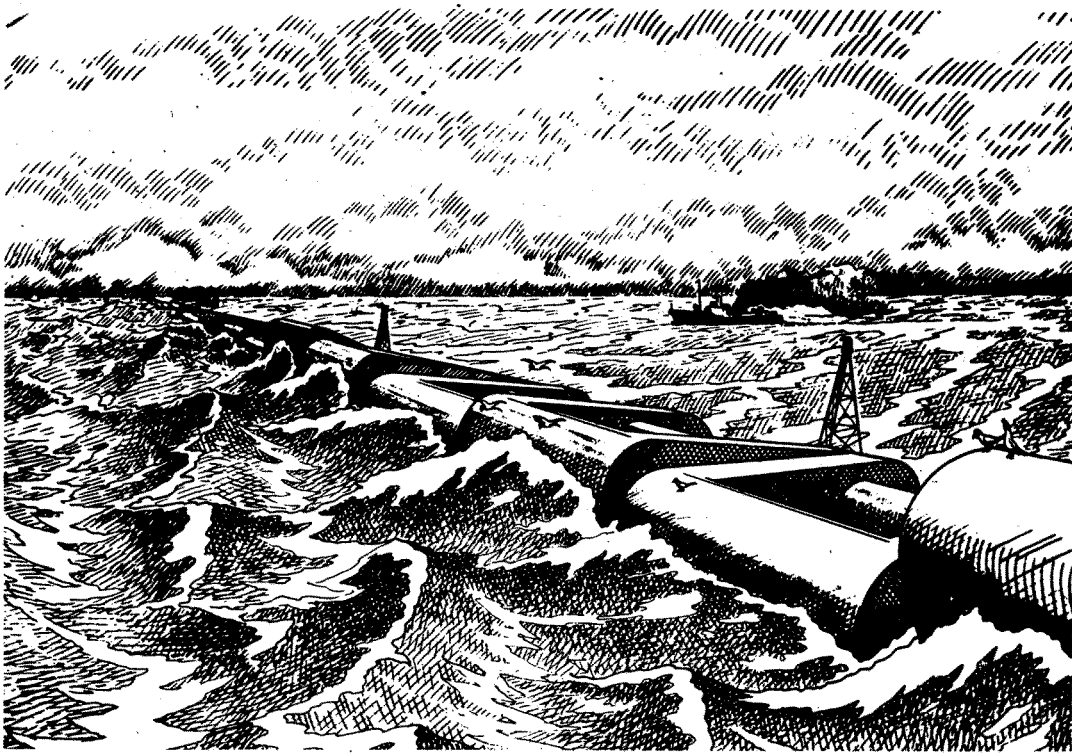
Chapman's own preference is for the adoption of the technical fix philosophy, followed by a long-term move towards the low growth pattern. There isn't room here to go into the details of such a policy but it does combine a concern for making the best and most efficient use of all resources with the realisation that growth must sooner or later be curtailed, if for no other reason than to avoid the potentially disastrous thermal pollution of the biosphere.

Wave Power would fit harmoniously into this policy if it could be developed and maintained at a realistic price in labour and capital.

THE SIZE OF THE RESOURCE

We are fortunate in having a great deal of information about the potential power in ocean waves off the UK. The most promising sites lie on a line stretching from Lands End in the South, around the West of Ireland, past the Outer Hebrides and on up to Shetland. Most relevant data has been collected from weather ships 400 miles out in the Atlantic. Wave conditions there are thought to be typical of those immediately off the West coast and this has been partially confirmed by some data collected in this area.

Waves travel very long distances before losing much of their energy. A typical Atlantic wave will take 250 miles to lose half of its power. In the meantime, while the original wave is decaying, new waves are being continually generated and enlarged by the action of the wind. Ideal wave fields thus contain a good mixture of locally generated energy with an underlying swell of longer waves originating sometimes in storms hundreds of miles away. These combine to yield an average power level off the UK of about 90 kilowatts per metre. This is correctly referred to as power density and the total power available at a site is obtainable by multiplying the power density by the length of the exposure to the prevailing wave direction. 90 KW per metre is equivalent to 180 times the average per capita consumption of electricity in the UK, but to obtain it wave generators would have to be 100% efficient. Such machines are Utopian. Although the most



Artist's impression
of string of Salter
Ducks at work somewhere
off the Hebrides
sometime in the 1980s

promising devices record efficiencies of 70% and more in small scale tests, there has to be a power limit above which the generating machinery opts out. A realistic estimate of the average power available from Wave Power sites off the UK would be 40kW per metre. At that rate, the total site described above could yield 66,000 Megawatts on average.

This corresponds closely to the total installed generating capacity of the British electricity boards. It is a paper figure, but it does illustrate the potential size of the resource. The investment in money and labour to utilise it all would be a bit like building all of Britain's motorways and all the vehicles on them. The comparison is interesting because wave power systems would use concrete in vast quantities as the main structural material and the mechanics of the power generation would be of similar complexity and scale to vehicle components. Unlike thermal power stations with massive 500 megawatt generators, the operating environment of Wave Power systems requires large numbers of small-sized generators working together, so that when faults occur individual units can be isolated automatically without disturbing the rest of the system. Maintenance must wait till Spring or Summer. Costs of wave-generated electricity will be at least 3p per unit at

today's prices, making it more expensive than fossil power. However, as coal, oil and gas prices inevitably rise, they may overtake those of Wave Power, where the principal costs are in capital and maintenance.

USING THE ENERGY

How much, if any, of the potential Wave Power available is ever exploited depends not only on the engineering of the devices themselves but as much on the ability of the country to use the energy. In common with other renewable energy sources, Wave Power outputs will show considerable day to day and seasonal variations. Whilst one of its most attractive features is the high Winter output, coinciding with high energy demand, there are times particularly in Summer when output would drop well below the annual mean.

The most convenient way to distribute wave generated power is in the form of electricity and this fluctuation has led electricity boards to consider Wave Power only as a saver of conventional fuels. They argue that Wave Power would not reduce the need for existing plant as it could not be relied upon all of the time. A less pessimistic proposal would be to retain enough of this plant to meet the peak Summer load and rely on the alternatives, including waves, to supply the additional seasonal load. Analysis of wave data has shown that the reliability of Wave Power in Winter would be at least as great as that of the present generating system taken as a whole.

(over...)

The attraction of the alternative sources is greatly enhanced by a generating system equipped with storage, but at present only a very limited pumped storage capacity is available. This may in the future be augmented by tidal power schemes which in the 2-basin form often proposed for the Severn are capable also of pumped storage. Short-term storage is also possible at the consumer's end where heat stores inside well-insulated buildings can be implemented. Sir Martin Ryle has recently pointed out that storage required to buffer a large nuclear system is exactly the sort which would make the alternative sources competitive.

THE ENVIRONMENT

A great attraction of Wave Power is its kindness to the environment. Nevertheless, its utilisation does require a transmission system and this inevitably will use overhead cables and pylons for the major part of the route. Underground lines are at least 17 times as expensive using today's technology. The energy route from the Hebridean wave fields runs through Skye. But visual pollution is less insidious than thermal pollution and if one unit of wave electricity saves one unit of fossil or nuclear energy, objectors will have to make the distinction.

Large systems will require co-ordination with seafarers. Most show understandable reluctance to dally in the best wave fields and installations can be much more easily illuminated than land hazards. As they will be semi-permanent, they will also appear on charts.

No significant ecological effect in the lee of Wave Power devices has been so far identified, though there is some possibility of interference with the spawning of certain fish such as herring.

THE FUTURE

The currently popular Wave Power devices have been extensively tested at small scale in wave tanks. The sophistication of these tests has increased and designers have much of the information required to start work on full-scale prototypes. In addition, at least one of the devices, the Salter Duck, is being tried out on a larger scale in the natural waves of Loch Ness where the wind patterns and long fetch provide a reasonable simulation

of an ocean environment. A great deal remains to be done on the design of the power take-off and transmission systems. Experimental work on these components will be carried out separately, before bringing all of the components together in a full-scale prototype sometime in the next decade.

WAVES AND DEVICES

Winds blowing across open sea transfer energy to the water. Winds themselves are atmospheric thermal currents and so wave energy is a manifestation of Solar Energy. Oceans act as gigantic reservoirs for this energy and deliver it to the shores of fortunate countries.

Water particles in a wave ideally move round in circular orbits. The water stays in one patch but the energy travels forward. The circular orbits are largest at the surface and decay exponentially with depth at a rate dependent on wavelength, being rapid for short waves and slow for long waves. The power in a wave is proportional to the square of wave height times the period of the wave. The long distances that waves travel after winds stop blowing imply that the orbiting water particles are very good at passing their energy on to their neighbours. The designer of a Wave Power device must fool these particles into treachery. The machine must appear to the water to have the same characteristics as the next bit of water would. This matching can be done in a number of ways.

THE MASUDA DEVICE of Japanese origin consists of a vertical chamber placed over the wave. Water inside the chamber oscillates up and down, sucking and blowing air through a turbine to generate electricity.

COCKERELL's RAFTS consist of a number of rectangular floats in the direction of the waves joined by hinges. Adjacent floats follow the wave profile and energy is extracted from their relative motion.

THE SALTER DUCK is cam shaped in cross section and its nose nods up and down with the waves about a central spine. The cylindrical rear transmits little energy past the duck and the immersed front section or paunch is shaped to match the movements of water particles.

solar power in the city



Despite gloomy statements about the lack of sunshine in Scotland, one organisation is in the process of installing an ambitious solar water-heating system. The Fountainbridge Housing Association, as a part of the modernisation of a tenement building in Watson Crescent, Edinburgh, is installing solar panels.

The solar panels are marketed by Pontins (who use them in their holiday camps) and are being installed as part of the modernisation plans drawn up by the architect Alan Mitchelson. With regard to the solar panels themselves, the combined expertise of Peter Greenwood (Director of Building Sciences, York University) and Howard Ward (Head of Construction Studies, Plymouth Polytechnic) has been used. In a sense this is significant, since it puts the use of solar panels in its place within the construction industry instead of making their installation an afterthought on the part of the motivated and wealthy.

The solar panel on the roof will pre-heat water to 30-60 degrees C and inevitably it will be more efficient in Summer. It will operate in conjunction with conventional immersion heaters charged at 'white meter' rates. The 15 tenants of the building will pay a service charge of £25 per year for the facility. This means that for the Fountainbridge Housing Association the installation cost of £6000 will be recovered in 16 years. Since the system has an estimated life of 30 years, the investment makes sound economic sense for the Housing Association.

The benefit to the tenants is not so easily quantified. The hot water will be cheaper (by about 50%) than with a conventional heating system; but it is difficult to tell if this represents a genuine saving since it is unlikely that the tenants would normally maintain a constant supply of hot water. On the other hand, it can be said that to have hot water constantly available is of undoubted benefit.

The Fountainbridge Housing Association is to monitor the system; and it is believed that the Housing Department of the Edinburgh District Council is closely following its progress. If the system is successful, can we hope to see similar developments in council housing?



17 Watson Crescent, Edinburgh,
Britain's first solar-panelled tenement

DEESIDE URANIUM --- PUBLIC MEETING ---

On Thursday 10 November the public packed Banchory Town Hall to hear the SSEB and Friends of the Earth explain their views on uranium exploration and extraction.

FoE (Aberdeen) were lucky enough to have Walt Patterson there to discuss the national and international issues and both Mrs. Marjorie Linklater of the Orkney Heritage Society and Councillor Mrs. Sybil Roebuck of the Orkney Islands Council to explain what happened in Orkney.

It was, to say the least, a stormy and controversial meeting, with many Deeside residents present as well as a number of local councillors and the M.P. Mr. Alick Buchanan Smith.

Both sides on the platform took some stick. There was the inevitable resentment against FoE Aberdeen as outsiders to Banchory and even more natural resentment against the SSEB for planning to devastate the area. The feeling of the meeting surged back and forth and gradually mounted against the SSEB, especially after Mrs. Linklater's speech. But the most sensational moment occurred at the last minute, when a local geology lecturer took the wind out of everyone's sails by claiming that his latest information indicated that local uranium deposits are virtually non-existent and could never justify mining!

The meeting launched a local residents' action group, a petition and another meeting to allow opponents of extraction to discuss further action. Meanwhile, it is to be hoped that the SSEB will start asking questions of the Institute of Geological Sciences and the Aberdeen University Geology Department...and if they still persist with an application for test-drilling, it is to be hoped that it will be firmly rejected, on a large number of grounds.

We all know how concerned the nuclear industry is for our health and how proud it is of its safety record. So, suppose for a moment that you were Chairman of the UKAEA and a dissident Russian scientist claims that an explosion of nuclear waste in the Southern Urals 20 years ago killed hundreds or even thousands of people. Subsequent investigation by a TV team produces more evidence, including CIA reports of the disaster. What would you do?

Would you dispute the fact that such a disaster could occur without bothering to investigate the claims? Would you simply dismiss all the evidence because with your 25 years' experience in the nuclear industry you know better? And would you inform the nation that you don't think it really matters whether it happened or not?

No, of course you wouldn't. But Sir John Hill, who actually is the Chairman of the UKAEA, did!



Sir John

You probably think I am making this up unless of course you saw the recent 'World in Action' report on ITV; it is certainly hard to believe that the head of the British nuclear industry could be so irresponsible. Why is it that the UKAEA doesn't want to know the facts, whatever they might be? Might it be that if a fatal accident, let alone a disaster as Dr. Medvedev claims, was proven to have occurred, then this could harm UKAEA's expansion plans?

The more nuclear installations we have the greater the chance of a serious accident, and considering the callous lack of concern for the safety of people in the surrounding areas, displayed by Sir John Hill, then there is cause for serious anxiety. It is very worrying that Sir John thinks it doesn't matter. Just how many risks is the UKAEA prepared to take to push their technology ahead? Does it matter to them what dangers we may be subjected to? Given Sir John Hill's disgraceful comments, I feel justified in asking.

"What if it did happen?" Sir John Hill asked. What indeed?!

Little Black Rabbit

Tony

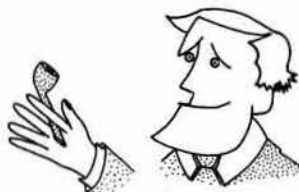
writes to you

Dear "Homicidal",

"Having trouble reconciling the fact that while public money is spent urging you to "Save It", more public money is spent urging you to buy more electricity?"



"Can you still not understand how those who in the past have called the AGR programme "a catastrophe we must not repeat" are now able to order more AGRs?"



"The solution to both these problems and many others lies in a whole new attitude of mind."



DOUBLE-THINK ELECTRIC

The views expressed in this Bulletin are not necessarily those of SCRAM. Comments and contributions are therefore always welcomed!

All correspondence should be sent to:

Mike Leven, Editor SCRAM,
2a Ainslie Place, Edinburgh 3.
(031-225 7752 office hours)

subscribe now!

I wish to subscribe to the SCRAM Energy Bulletin for 1 year (6 issues).

Name.....

Address.....

.....

I enclose cheque/PO for £1.00

(cheques payable to SCRAM; no receipts issued unless requested)

Signature.....

Date.....

Please send this form, subscription fee (plus any donations!) to SCRAM, 2a Ainslie Place, Edinburgh 3. Thanks.