SERA was founded in 1973 to campaign for the socialist policies necessary to combat the fouling of the environment and the squandering of natural resources. Membership is open to all individuals or organisations who share its aims.

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SERA

NUCLEAR POWER

Why Not?

SERA Energy Group

Socialist Environment and Resources Association

SERA

Preface

SERA is a labour movement organisation with consultative status within the Labour Party. It has affiliations from national unions, local branches, trades councils, and Constituency Labour Parties.

SERA has been campaigning over the past few years within the trade union and labour movements to stimulate discussion on energy policy, with the focus on issues of relevance to organised labour. We believe that nuclear power raises key issues for the labour movement.

This introductory pamphlet attempts to summarise our case against nuclear power. A separate pamphlet *Non-nuclear Energy Options for the UK* sets out our case for the alternatives.

The arguments here are developed further in *The Politics of Nuclear Power*, edited by Dave Elliott, to be published by Pluto Press in November 1978.

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What is nuclear power?

A tiny fraction of the uranium dug out of the ground consists of a radioactive material, Uranium 235, which under certain circumstances can be induced to undergo 'fission'—its atoms break up, releasing energy and radiation. The heat resulting from this can be used to boil water and raise steam—just as in a coal or oil fired power station—which can then be used to drive turbines to produce electricity.

Britain's first and second generation nuclear power plants both work like this—using carbon dioxide gas to transfer the heat from the reactor core. Some American reactors use water to transfer the heat from the reacot core.

One by-product of this process is the creation of plutonium in the reactor core from the non-radioactive uranium. Supplies of uranium 235 are limited and expensive to obtain, so it has been suggested that we use the Fast Breeder Reactor (FBR) to generate plutonium as a new fuel in greater quantities. the great hope of the nuclear lobby, but it is a much more complex technology, the associated risks are greater, and it would considerably increase the amount of plutonium and radioactive waste in transit between reactors and fuel reprocessing plants like Windscale. A public enquiry on whether we should build a full-scale FBR is likely in the near future.

Nuclear power—why not?

Britain's nuclear programme has been the subject of increasing criticism in recent years. The current proposed programme calls for the provision of a total of 40GW* of nuclear capacity by the year 2000—which implies the construction of 24 or more new nuclear plants. Many people are unsure of the wisdom of such a large programme on environmental and safety grounds. But Britain has around a dozen atomic power stations at present—producing 4% of our energy—and some of these have been operating without problems for a couple of decades. So what is all the fuss about? This pamphlet focusses on problems that are likely to concern us all—but particularly trade unionists and the labour movement generally.

Firstly, Britain's civilian nuclear power programme grew out of the atomic bomb programme and the link with weapons technology has proved hard to break. The first 'civilian' atomic power station at Calder Hall was in fact built to produce plutonium for the 'British independent nuclear deterrant'. The electricity it generated was incidental. Even so, some people hoped that the weapons programme could be turned to peaceful uses—'atoms for peace' was the slogan, and at the time it seemed a progressive demand. But there was an unavoidable technological link between the weapons and civilian aspects. Civil nuclear material can be diverted to weapons use. The civil nuclear route is one way in which non-nuclear countries can acquire all the facilities needed to make weapons with a perfectly legitimate cover for the operation.

As civilian nuclear power programmes expand, and as more and more fissile material is in transit between power stations and reprocessing works, the risk of illegal diversion of bomb-making material by terrorists or criminals inevitably increases. And of course it is not just 'terrorists' we have to worry about—but mainly governments. No system of treaties, inspection programmes or technical safeguards can protect us from this. In the right circumstances a government could produce a bomb in a matter of days or even hours, and it is South Africa, Brazil, Iran, South Korea, India and Pakistan that are reaching for this capability.

But we have lived with the threat of nuclear annihilation for quite a while now. People have lost interest. It has all become rather remote and unreal . . . and certainly it does not seem to be an issue of current significance for shop-floor activists . . . But that's not quite true: some of the implications for workers of the proposed expansion of nuclear power in the UK are far from unreal or remote. Take for example the impact of the need for tight security in the industry on the workforce and trade union rights.

Workers power versus nuclear power

Workers in the industry are subject to detailed screening on appointment and, as the Royal Commission on Environmental Pollution indicated in the Flowers Report, may be subject to special systems of surveillance while in employment—including the use of informers, infiltration of groups, phone tappings and opening of mail. Workers are covered by the Official Secrets Act, and if sacked automatically lose their right to appeal against unfair dismissal if the employer claims that it was 'for the purpose of safeguarding national security'. (T.U. and Labour Relations Act)

The normal operation of trade unionism seems likely to be inhibited in a number of ways—for example by restrictions of the provision for disclosure of information to shop stewards for bargaining purposes (Employment Protection Act). There's a specific exemption in the Act for 'information the disclosure of which would be against the interest of national security'. There is a similar let-out clause in the Health and Safety at Work Act—an area of key importance in this industry. Trade Union appointed safety representatives are specifically denied 'any information the disclosure of which would be against the interests of national security'.

Then there's the question of industrial action. Both British Nuclear Fuels Ltd (BNFL) and the UK Atomic Energy Authority (UKAEA) union agreements contain 'no strike' clauses. Despite this there have been unofficial strikes. The most recent was in the spring of 1977 over pay and conditions. It was brought to an end after 7 weeks following threats that troops would be used to break the picket line and bring in materials allegedly needed to maintain safety on the site. One of the stike leaders was also threatened with the 1875 Conspiracy and Protection of Property Act.

Obviously in this industry it is vital to maintain safety and security—but if this means forgoing hard won trade union rights we need to think very carefully before we expand it further.

*GW = 'Giga Watt' or 1000 megawatt, or 1 million kilowatts. A typical 1 bar electric fire uses 1 KW every hour.

Future energy needs

But surely, you'll be saying, we *need* the energy and so we'll just have to accept these problems. All too often opponents of nuclear power are accused of condemning us to a future of freezing in the dark.

Well, it is just not so. Firstly it is by no means clear that energy demand will continue to increase—it's been static over the past few years, and official forecasts for future demand have been falling continuously. A recent estimate by the Science Policy Research Unit at the University of Sussex suggests that we may in fact consume *less* energy by the year 2000 than at present as a result of improvements in energy conservation: consumption might be as low as 335MTCE.

A study by the International Institute for Environment and Development suggests that, given the likely adoption of conservation measures and efficient use of the energy available, the ownership of consumer durables, including cars, could increase, while energy consumption in the domestic sector would be only 60% of present. Savings could also be made in industrial and transport sectors.

We currently waste the majority of the energy we get from fossil fuels. For example, current generation of electricity to provide heat is only 24% efficient—that means that ¾ of the heat energy produced by the fuel (whether coal, oil gas or nuclear) is wasted—most of it rejected into the environment from cooling towers. Most of this energy *could* be used to heat houses, schools, hospitals etc through the intoriduction of *district heating schemes*. And then there are the 'alternative' or better described as renewable, energy sources—wind, wave, solar etc. Britain is in fact well placed to benefit from both the rational use of these and the export potential that will soon exist.

Official energy forecasts for the year 2000 in millions of tons of coal equivalent

Energy research and development in the UK (June 1976)	**420–700 MTCE**
Energy Policy Review (June 1977)	**500–650 MTCE**
Working Document on Energy Policy (October 1977)	**450–560 MTCE**
Current energy consumption	**342 MTCE**

Alternative energy sources

But can the alternative energy sources meet our needs? Well, despite being starved of funds, it is already apparent that the various alternative renewable resources—the sun, wind, waves and tidal power—could make a significant contribution to meeting our energy needs within a couple of decades. We currently consume 340 million tonnes of coal equivalent (MTCE) annually; it has been calculated that the renewable alternatives could provide half of this by the year 2000—and perhaps 200MTCE eventually. A target of 100MTCE by the turn of the century seems reasonable.

For example, by the year 2000 windpower units—mainly sited offshore—could provide 25% of our electricity and, given a means of storage, could be just as reliable, if not more, than nuclear. According to the International Solar Energy Society, solar energy could meet 14% of the UK's energy demand, (with flat plate solar collectors providing domestic and industrial space and water heating) while wave power systems, consisting of long chains of giant (50,000 ton) rocking 'ducks' could provide perhaps a third of our energy. Then there is the likely contributions from tidal power, biomass (fast growing fuel crops) and biosynthesis (organically derived fuels) and the savings that could be made from conservation: the Building Research Establishment estimates that improved insulation could save 15% of our primary energy while ACORD estimates that a 25% overall is feasible, given a major commitment to conservation.

In the interim, while the alternative renewable sources are developed fully, we have the remaining fossil fuels. Our stocks of coal will last 300 or more years at present levels of consumption (one recent official report put it at 900 years . . .) and can provide 120 MTCE or more annually. We obtained 200 MTCE annually in the 1950/60s before the cut-back in the coal industry. So there is no 'energy gap'—only a technology gap, which implies a major investment programme in the development of the alternatives. The alternative technologies are, in general, less complex than nuclear technology and should be easy to develop rapidly. Of course they will have to be subject to detailed environmental scrutiny, just as with any other energy source. And if we are to continue to use it more efficiently (in combined heat and power units) and that money is spent on pollution control and on improved mining safety. It is worth noting that coal mining deaths have fallen by a factor of ten in the last couple of decades—mainly as a result of the relatively small investment in mechanisation. And it is worth pointing out that even on the most ambitious nuclear scenario we would still have to rely on coal. So 'going nuclear' does not mean less mining deaths: but investing in automated mining could.

Official estimates of official contributions from alternative 'renewable' energy sources by the year 2000—*Select Committee on Science and Technology/ House of Commons Paper 534—1 (1977)*

Wind (offshore)	10—20 MTCE
Wave	15—25 MTCE
Solar	15 MTCE

Note: Each of these relatively conservative estimates amounts to more than we currently obtain from nuclear power.

The road to ruin

But surely nuclear power will support economic growth and underpin our prosperity? well, firstly, in terms of exports, nuclear power has not been a spectacular economic success for the UK—only two reactors have been sold abroad. And it presents major problems for the domestic economy. Nuclear power technology is very expensive. The sort of programme at one time being envisaged by the Atomic Energy Authority could absorb 10% of our GNP, starving investment from other parts of the economy, such as manufacturing and the public services. It would be like the Concorde but ten times worse—with vast amounts of taxpayers money being fed into the giant engineering consortia. Actually there are, these days, very few big companies willing to take the risk with nuclear power—it is not profitable enough, at least at the early stages. Large profits can only be guaranteed if you have a massive nuclear programme, so that plants can be mass produced. Indeed, the whole game of nuclear power plant construction has been based on the needs of the (private) industry to make profits—with scant regard for the actual needs of the consumer. The financiers and speculators would not be interested in a small nuclear programme—it's all or nothing. Despite the fact that it is pretty clear that we do not need large (or even small) numbers of new plant for several years: we already have 40% excess generating capacity.

Employment options

But surely you'll say, if nothing else, all this investment could at least create lots of *jobs*. Well, here again the answer is no, nuclear power is very capital intensive. The expansion of reprocessing facilities at Windscale will cost £600m and will create 1000 jobs. That's £600,000 per job—compared to, say, £20,000 per job in conventional industry. In general a unit of energy produced by nuclear technology requires more capital and less labour than the same unit of energy produced or saved by non-nuclear technologies. And the labour-intensive 'alternative' options tend to involve a wider

Jobs and energy

At first glance it seems reasonable to assume that increased energy production and availability will create jobs—jobs in power stations, in the firms that build generating equipment and in industries which use energy. But at the same time it is clear that, historically, energy and capital have been introduced to replace labour in order to increase productivity and profits. Much of the current mass unemployment is permanent 'structural' unemployment rather than temporary 'cyclical' unemployment—generated in part by the introduction of new labour saving devices. So increased energy use does not necessarily mean more jobs—it often means less—depending on the technology used.

In the energy supply industry it is the same story. Output has increased (for the CEGB by 34% between 1967—76) while employment has decreased (21%) as a result of the introduction of more 'efficient' technology and the acceptance of productivity deals.

That is not to say that technological advance and increased productivity is bad. But we must begin to ask 'productivity for what social end and at what social cost?'

range of job types and skills in a wide range of geographic locations.

Thousands of jobs could be created immediately in the construction industry if we invested large sums in a national insulation programme or in other labour and skill intensive projects, such as the construction of medium sized combined heat and power stations linked to district heating networks—jobs in the cities where they are needed.

Then there are the various new alternative renewable technologies such as windmills, wave and solar power systems. Wind and wave power could provide much needed employment in the aerospace and shipbuilding industries—as has been recognised by shop stewards at Lucas Aerospace, Vickers and elsewhere, who are campaigning for product diversification as an alternative to redundancies, while solar power development would mean work for the construction and materials industries.

Most of these new technologies tend to require more labour and less capital than nuclear power. For example, an official US report indicated that the capital to labour ratio for windpower is $33,784, compared to $79,721 for nuclear power. A report by the California Employment Development Agency estimates that a solar power programme could create 6.6 times more jobs than an equivalent nuclear programme.

SERA believes that it is possible to adopt an alternative industrial strategy which will meet needs and create jobs without requiring an enormous increase in energy production. Labour intensive conservation measures and the development of alternative energy technology options coupled with the support for a new skill intensive recycling, repair and renovation industry, could create many jobs without absorbing large amounts of energy. And energy saving advanced technologies could be adopted by industry and commerce which would enhance rather than replace skills as is the case with most types of automation at present. Note that such a strategy does *not* imply a return to primitive technology or frugal lifestyles; there would be room for considerable growth in consumption for most people but with the emphasis on quality rather than quantity.

Health and safety

Nuclear power is dangerous. Workers in the industry are exposed to hazards whose implications have yet to be fully appreciated. The industry is proud of its safety record, but this has been marred to some extent now by the recent events at Aldermaston, and frequent, widely publicised incidents at Windscale. The experts disagree as to the long term impact of contamination and exposure to radiation—a regular experience for many workers in the industry. It will be several years before we have conclusive scientific evidence either way. But it is clear that there *are* grave problems in the here and now. The GMWU recently succeeded in winning £30,000 compensation for two widows of workers at Windscale, whose deaths were allegedly the result of working with radioactive material. And it's not just workers who may be affected. A recent official report estimated that, given a 'worst case' nuclear accident, '. . . several thousand people would die within a few weeks, plus many others subsequently from cancers . . .' The chance of such an accident may be remote, but it cannot be ignored. The US Rassmussen Report estimated that a major accident (e.g. a melt down) might be expected only once in every 17,000 reactor (running) years. But with 1,000 reactors operating worldwide within the next decade or so, that means that an accident of this sort might occur once every 17 years . . .

Nuclear power—a multinational phenomenon

Britain is not alone in developing nuclear power. Our own programme is dwarfed by the giant US nuclear effort. They already have 70 reactors operating and some 150 or more under construction or on the drawing boards. Another 2000 are planned in the near future.

France and Germany also have very large programmes—with riot police being used to suppress the mounting opposition from local farmers, citizens and anti-nuclear groups. Pitched battles have ensued at reactor sites in Germany and France.

The Soviet Union is embarking on a somewhat small programme—it currently has around 25 plants operating, under construction or on order, giving them only around 50% of France's nuclear power output.

An early dream of the pro-nuclear lobby was that atomic power would benefit the Third World—but this has not proved to be the case. India's Canadian supplied reactor has simply provided a means for producing a bomb. But more worrying is the fact that Chile, Brazil, S. Africa and S. Korea are also the happy recipients of Western nuclear know-how. Britain provided technical assistance for a small 'research' reactor in Chile; Wimpeys have been building a reactor, designed by GEC, in S. Korea, and British Nuclear Fuels shares an interest in an international consortium which deals with the Brazillian reprocessing corporation, Nueleabra's (where 50% of our uranium ore comes from) and with S. Africa. RTZ—which has financial links with BNFL—meanwhile mines uranium in Namibia.

It is the familiar game of big business on an international scale with scant regard for the risks of proliferation, terrorist attacks or major accidents.

Conclusions

Obviously the problem of unemployment cannot be completely solved within a capitalist system which encourages the replacement of skilled workers by energy and capital intensive machines. Yet it is vital in the fight for socialism to challenge the logic of this use of technology and, in particular, to challenge nuclear technology. Nuclear power is a technological gamble developed by and for the capitalist system to serve its own ends.

Not only is nuclear technology dangerous in terms of our health and safety, in terms of long term waste storage problems, in terms of weapons proliferation etc, but it also threatens to reinforce the power of the state and the giant energy monopolies.

Nuclear power at present is insignificant in energy terms—producing less that 4% of our energy in the UK. Yet many energy planners and government officials would like to see it greatly expanded. That way the miners would be outflanked and it would pave the way for the growth of a sector of the economy in which trade unionism was undermined.

These are not the only reasons for the state's enthusiasm for nuclear power—but they are important factors from the point of view of organised labour—as are the general economic and employment issues raised earlier.

Immediate demands—create jobs not plutonium

1. A complete halt to any further nuclear power developments, apart from those required to improve the safety of existing plant and processes.

2. A national programme of energy conservation and building insulation The government has already announced a small (£250m) programme: a full-scale programme designed to insulate all 19 million homes would cost £1800m over five years and create 24,000 jobs in the construction industry, plus many more induced/indirect jobs in the materials industry and elsewhere.

3. Rapid development of *combined heat and power* and *fluidized bed coal combustion* technology. A full CHP programme would cost £3000m and take 25 years to complete. It would create work in the construction industry and for the power engineering firms, as would fluidized bed development. £200 m was recently allocated to coal technology Research and Development—including £50m £50m for fluidized beds. The other key areas are mining technology and pollution pollution control.

4. Rapid implementation of *solar power* for domestic space and water heating using flat plate collectors. Several local authorities have already set up solar housing projects. Demand for solar units in the UK and in the Third World is increasing steadily.

5. Major programmes of *wind* and *wavepower* development. A £1,500m windpower programme could supply 10% of our electricity, while a £1000m wave power project could allow us to generate a third of our power from the waves. Development of these techniques would create many jobs in the aerospace engineering and shipbuilding industries—as would the development of *energy storage* techniques.

6. Rapid development and implementation of *heat pump* systems for space heating. This could be a major industrial growth area, with an estimated European market of £1000 m by 1985.

7. Increased research and development on biosynthesis, biomass and on the use of hydrogen as an alternative fuel. A whole new industry seems likely to emerge in this field.

These demands are primarily directed at the government and at the various Research Councils and agencies. But they can also be raised in the trade union movement, both in order to put pressure on the government via the unions and as bargaining demands within industries which could deversify into these areas.

SERA—Socialist Environment and Resources Association—is taking these arguments out into the labour and trade union movement. SERA can provide speakers on request.