

# **A submission to the Energy Policy Review**

## **Nuclear power in UK energy policy**

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*This submission represents the views of the above as individuals and not necessarily those of their organisations*

# Nuclear power in UK energy policy

Reports published by the government in recent years on future energy policy for the UK have not included nuclear power as an important component of a sustainable energy mix. Nuclear has been discounted because it was claimed to be uneconomic, to have unsolved waste problems and to lack public acceptance

But times are changing and there are signs emerging that the future potential of nuclear power and its strategic importance is now being recognised. This change has been driven mainly by two factors.

- (i) The threat to the environment of global warming and the consequent need to reduce carbon dioxide emissions, coupled with a realisation that we can only meet the future energy demand and at the same time reduce our dependence on fossil fuels by maintaining a significant nuclear power output. The so-called renewable sources such as wind, solar and tidal power, although important, will not suffice.
- (ii) A recognition of the need for diversity of energy sources and security of supply. This has been emphasised by the recent experience in California which has exposed the fragility of their electricity supply system and has resulted in renewed interest in nuclear power in the USA.

Currently some 25% of the electricity generated in the UK is from nuclear stations but unless new stations are built this contribution will run down over the next two decades to only 3%.

If we are therefore to maintain nuclear power as a significant component of a sustainable and diversified energy policy for the UK, which will also allow us to meet our environmental obligations and our Kyoto commitments, then new nuclear stations must be built without delay.

The challenge should not be underestimated. Some 10,000MW of new nuclear capacity will be needed to replace the existing stock as it reaches then end of its useful life. This task will represent one of the largest infrastructure projects to be tackled in the UK. It will require the attention and strong support of government at the highest level if it is to succeed.

## **The challenges facing new nuclear build**

Nuclear power has to compete in a privatised and commercially driven electricity supply industry and before new nuclear stations can be built the following challenges must be overcome.

- (i) Investor confidence must be increased on the basis of a sound business case consistent with a robust strategy for management of risks

- (ii) The nuclear waste disposal problem must be solved. There are no insuperable technical difficulties which could preclude an environmentally acceptable solution. It is a political problem because in society it has become an emotive issue.

It is important that the government and its officials should support the industry in putting the **problems of nuclear waste** into perspective. The industry has made good progress and its future strategy is sound. This should be recognised and publicised and sensational claims of some extreme groups should be challenged.

A robust case to attract **investment in new nuclear build** will depend on several factors. One important positive factor is the excellent performance of our existing nuclear stations in the UK since they were privatised as well as stations elsewhere in the world. Nuclear has competed successfully with gas in a deregulated market and has increased its market share in the UK from 21% to 25% (it has even reached 27%). This has been due to sustained improvements in output coupled with reduced costs. At the same time the excellent safety performance has been maintained.

A vital factor will be the soundness of the future business case for new nuclear stations. The economics of nuclear power are improving with the advent of new designs such as the BNFL/Westinghouse AP600 reactor system which the UK now owns. This system has recently been approved by the Nuclear Regulatory Commission in the USA. These reactors are smaller, they possess a high degree of passive safety, they can be accommodated more easily by the grid and can be built more quickly and more cheaply. There are also good examples of advanced designs in other countries. But whatever reactor system is chosen it is vital that the UK has a standard system which can be built as a series of the same design. We must avoid yet another design unique to the UK.

Recent studies indicate that with series build the new designs are getting nearer to being capable of competing successfully with gas stations. A carbon tax which, unlike the current energy tax, is a logical fiscal instrument for reducing CO<sub>2</sub> emissions, would tip the balance clearly in favour of nuclear. The uncertain future cost and security of supply of gas for the UK are important additional factors in favour of nuclear.

It is government policy to encourage renewable sources of electricity to reduce CO<sub>2</sub> emissions and this is clear from the fact that the industry will be required to generate 10% from renewables and market this at a favourable tariff. Creating mechanisms such as these for renewables is a justifiable way of ensuring that policy objectives are met. But 'renewables' is really a misleading term. It should be replaced by 'carbon-free sources' and nuclear power should share the incentives offered to 'renewables' because of the common aim of reducing CO<sub>2</sub> emissions. Just as 10% has been allocated to 'renewables', so 25% should be allocated to carbon-free nuclear and the arrangements for the nuclear obligation should be based on those for 'renewables'. Without nuclear power the government will fail to meet its challenging environmental targets, particularly in the longer term.

But there is a serious obstacle to the building of new nuclear stations in the UK. This is the current planning and regulatory system for nuclear projects. The current regulatory processes in the nuclear industry are likely to result in the frustration of new initiatives to build new nuclear stations (and also fuel cycle plants) which will be vital to our future energy strategy. This is an important issue which this submission will address.

## **The problems caused by the current planning and regulatory system for the nuclear industry**

For new build projects there are three regulatory issues to address, namely;

- (i) the initial planning approval
- (ii) approval to design, construct and operate
- (iii) the economic regulation of the market

These will be considered in turn.

### **Planning approval**

The last nuclear station to be built in the UK was Sizewell B in Suffolk. Planning approval for this involved a long drawn out public Inquiry which lasted nearly six years and involved an enormous cost. It was very wide ranging and dealt with issues far beyond those of local concern, notably national energy policy issues. Such delays, costs and uncertainties would not be acceptable to potential investors in future. It is a prerequisite for new nuclear build that the planning process be streamlined and improved.

### **Approval to design, construct and operate**

For the design and construction of new projects the Nuclear Installations Inspectorate (NII) is generally the lead regulator. The Sizewell B design was based on PWR technology which had previously been licensed and operated throughout the world. Nevertheless significant design changes to satisfy the UK regulators resulted in delays and a very costly one-off design.

Design and construction of a large nuclear project such as a new power reactor or a fuel cycle plant involves a major financial commitment. The main problem with the current regulatory system is that after completion of the plant, when the financial commitment has already been made, the EA must again approve the environmental impact of the project before it can be operated. This approval process normally involves a protracted public consultation exercise. The project has also to be 'justified', not only in terms of discharges to the environment but also in terms of the commercial case which should only be the concern of the investors. The classic example is the Sellafield Mixed Oxide Fuel Plant which was completed in 1996 at a cost of £460 million but has not yet operated and DEFRA has now started the fifth phase of public consultation. This is the 'dual jeopardy' problem and unless the process is changed the result will be that no commercial organisation will be prepared to make the very large investments needed for nuclear projects which could be put at risk by a later second stage of authorisation.

The regulatory procedures covering a nuclear project, from the initial planning approval, through design, construction and operation, must be set out clearly as a joined-up process

and agreed by all parties at the outset. Full approval to build and operate must be given at the start of the project before the large financial commitment has been made.

### **Market regulation**

Ofgem is charged with ensuring that true competition prevails and the interests of the purchasers of electricity are safeguarded. This has created a barrier to new nuclear build. Nuclear by its very nature is baseload. The post-NETA market is half-hour by half-hour competition. No one will enter into long term power purchasing arrangements necessary to finance new nuclear build.

Only gas can match the flexibility required of today's market and even for gas, there has recently been cancellation of investment in new generation. Just as interference in the market by the Californian state government resulted in blackouts there, there is a real possibility of this in the UK.

### **Knock-on Effects**

If other industries, notably other energy industries, the chemicals industry and the oil industry, were to be regulated in the same way as the nuclear industry the results on the UK economy would be serious. There is a real risk that this could happen. It has in fact already happened with National grid projects.

Any major investment in generation requires a connection into the National Grid system. This connection may well require a strengthening or modification of transmission lines further away. The local authority has to give approval for such work on the grid and this could involve a major planning inquiry far from the new power station. This is a 'double jeopardy' to the development of any new power station. Any private sector investor will be concerned at this risk. The scale of investment in a nuclear plant will amplify this risk greatly.

## **Conclusions and recommendations for action**

Nuclear power should continue to be an important component of our future energy strategy in view of the growing need to curb carbon dioxide emissions and to ensure the diversity of electricity sources and security of supply.

Some 25% of our electricity in the UK is now generated by nuclear stations but most of these are now nearing the end of their useful commercial lives. New nuclear stations are needed to replace the existing stock and this is a serious challenge. However, the current planning and regulatory policies in the UK will frustrate new initiatives to build these new nuclear stations. To alleviate these problems the following recommendations are proposed for consideration.

## **Recommendations**

- (1) The planning process should be changed to avoid lengthy Planning Inquiries which would undermine investor confidence. This would involve the separating out of national policy issues which should be determined by government and restricting the local Inquiry to local issues.**
- (2) It is vital that full approval for design and operation of large and costly nuclear projects should be given at the start of the project to avoid the parallel double regulation problem, the 'double jeopardy', whereby the very large investments for a nuclear project could be put at risk by the need to seek approval to operate after the plant has been constructed and the investment made. Otherwise investment in new nuclear projects will not be feasible. In view of the long term nature of nuclear projects long term stability in the regulatory process is also necessary.**
- (3) The cost of development and design of nuclear reactors is such that they are now global products and global licensing needs to be considered. The UK regulators should therefore be encouraged to take more note of other competent licensing authorities' work and focus on local issues rather than start the licensing process for building these reactors in the UK from scratch. This would greatly reduce the time and cost of licensing new reactors for the UK which have, for example, been already licensed by the NRC in the USA. However a high degree of competence will still be required by the UK regulators to support a large new nuclear build programme efficiently.**
- (4) Nuclear power should share the incentives offered to 'renewables' because of the common aim of reducing carbon dioxide emissions. Just as 10% of generation has been allocated to 'renewables' so 25% should be allocated to carbon-free nuclear.**
- (5) A carbon tax would be a more logical fiscal instrument for reducing carbon dioxide emissions than the current energy tax.**
- (6) The government should support the nuclear industry to put radioactive waste issues into perspective. It is a political problem. There are no insuperable technical problems which preclude solutions which are safe, environmentally sound and financially viable.**