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## UK Plan to Turn 60,000 Tons of Nuclear Waste into Electricity

A plan by the nuclear industry to build a £1bn fuel processing plant at Sellafield is being backed by the government's chief scientist. The plant would turn the UK's 60,000 tonnes of high-level nuclear waste into reactor fuel that will provide 60 per cent of this country's electricity until 2060, it is claimed.

'We can bury our reactor waste or we can treat it and then use it as free fuel for life,' said the cabinet's chief science adviser, Sir David King. 'It's a no-brainer.'

But the plan is controversial. A report by the Nuclear Decommissioning Authority, which operates the Cumbrian plant and backs the plan, acknowledges the move could have 'downside' economic costs, although it also stresses it has many benefits. In addition, green groups say the move would lead to the creation of 'a plutonium economy' in Britain that would see large quantities of nuclear fuel being transported across the country.

The Sellafield reprocessing plant would cost several billion pounds, a price that infuriates opponents of nuclear energy. 'There is no economic justification for this plan,' said Roger Higman, of Friends of the Earth. 'It would just be another massive subsidy for the nuclear industry. We should invest in renewables.'

But this criticism is firmly rejected by King. He has already helped persuade the government to back a new UK reactor construction programme scheduled to be approved in the new year. 'A UK citizen is responsible for emitting 11 tonnes of carbon a year on average,' he said. 'In France the figure is six tonnes - because France relies on nuclear power, which produces virtually no carbon dioxide. That is why we must replace our old nuclear reactors when they reach the end of their working lives.'

But building new reactors is controversial. Apart from their high construction costs, analysts say uranium could become scarce and expensive, with supplies from Canadian and Australian mines drying up in the next 20 years. Reactors would then have no fuel.

But this prospect is dismissed by King. 'We have a massive reserve of high-grade plutonium and uranium in Sellafield's nuclear waste,' he said. That stockpile - generated by Britain's reactors since the Fifties - contains six tonnes of plutonium and about 60 of uranium. However, it is mixed up with other highly radioactive reactor by-products.

To make nuclear fuel from this waste, its plutonium and uranium would have to be extracted, a task that can be achieved using Sellafield's Thorp reprocessing plant, though it will require a £1bn refurbishment to achieve this, said King. Alternatively, a new reprocessing plant will have to be built.



Then the plutonium and uranium will have to be turned into a fuel called mox, or mixed oxide. A plant to make mox could cost a further £1bn, or Sellafield's existing mox plant could be refurbished at a similar cost. Once these two plants - Thorp and mox - are ready, the 60,000 tonnes of nuclear waste, the leftovers of fuel production work and other highly radioactive material that has accumulated from Britain's nuclear energy programme, could be processed.

The resulting fuel rods and pellets could then be burned in nuclear reactors over the next few decades. In turn, the waste could be burned in a new generation of power plants called fast breeder reactors. Under this scheme, Britain would be near self-sufficient in nuclear fuel for the rest of the century. 'Studies carried out for the NDA have looked at a range of options for this material and shown that its use in a new generation of nuclear plants has potential viability,' said Bill Hamilton of the NDA. 'However any decision on such a programme is a matter for the government.'

This point was backed by King, who said the investment would be repaid by generating electricity.



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