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UK: Back to the nuclear future**ANALYSIS**

By Richard Black

Environment correspondent, BBC News website

Back in the days when atoms were clean, white coats were trusted and socialists were socialists, building nuclear reactors was, politically, a comparatively easy task.

A national need was identified, a national programme was ordered into action, and a national reactor design (or two) eventually emerged.

How things have changed. While this government talks in its new nuclear White Paper of "approving" construction of a new nuclear fleet, or of "needing" to supply much of its electricity from within Britain's borders, it also says that the best way to keep Britain's lightbulbs burning is through ensuring a genuinely free market for energy.

The trick, then, is to create the market conditions that will produce a nuclear solution.

That means streamlining the labyrinthine processes for gaining planning approval and setting some parameters on the disposal of nuclear waste - both steps that the government has taken.

Companies have also been asking for a guaranteed minimum price for carbon emissions to ensure that nuclear costs remain competitive in the future against fossil fuels.

That, so far, they have not got, although discussions continue at European level, and the White Paper says the government "will also keep open the option of further measures to re-inforce the operation" of the EU Emissions Trading Scheme (ETS).

Thursday's announcement does not therefore ensure that a new generation of reactors will materialise.

But it does make new nukes distinctly more likely, especially when combined with other factors out there in the world beyond Westminster.



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Oil powered

"Every utility provider around the world faces some pretty difficult choices about what they should do in a competitive market place," observes Mark Hughes, leader of the European Utilities team at PricewaterhouseCoopers.

Three factors, he and other analysts believe, are leading the industry back towards nuclear technology.

"One is that, over the last few years, we have seen pretty sharp increases in oil and gas prices, and even coal. The second issue is energy security; and the third dimension is climate change.

"They all lead towards nuclear as an alternative way forward... but if I had to put my finger on the biggest single factor it would be oil at \$100 a barrel. It may be that the Saudis tell us there's no need to worry, but it's hard not to worry when you see these prices going up and sticking there."



France has long relied on nuclear power to keep the nation's lights on

The government believes that against this backdrop, nuclear electricity is likely to prove cheaper than all renewables - perhaps cheaper than coal or gas too, depending on price movements.

EDF Energy appears to agree, the giant French-based company announcing it wants to build four nuclear stations in the UK, in response to its customers' demand for "stable and affordable prices".

In the last few years, Finland, France and the US have all decided to renew their interest in a technology that languished while fossil fuel prices remained low; Britain is simply following suit.

Five flaws

Whether a new fleet of stations achieves what the government says it wants them to achieve is another matter.

Tom Burke, a visiting professor at Imperial and University Colleges in London and a former government advisor on the environment,

“ Nuclear and renewables are competing for the same market ”

Matthew Leach, Energy Institute believes there are major holes in its logic.

"It hasn't explained how nuclear electricity helps you improve your security of oil supply," he says.

"It hasn't explained how nuclear electricity can replace the 80% or so of our gas that is used for domestic space and water heating, industry and for load-following electricity generation."

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Another question, he says is how a technology with approval and construction timelines in the order of 10 to 15 years can fill the "energy gap" which Britain will face much earlier, as old coal and nuclear stations close.

Even if stations can open by 2018, as Business Secretary John Hutton believes possible, they will make little impact on meeting the national target of reducing greenhouse gas emissions by about 30% by 2020; but this is not, he said, a valid argument against nuclear energy.

"We are not going to solve climate change by 2020," he told reporters.

"It's going to take two generations to de-carbonise our economy; between 2020 and 2050 we are going to face a lot of issues, and this is where nuclear can make a difference."

Professor Burke's point about "load-following electricity generation" is picked up by Matthew Leach, Professor of Energy and Environmental Systems at Surrey University and a fellow of the UK's Energy Institute.



The four nuclear contenders

"Neither nuclear nor renewables are really flexible - they're not there just when you want them; you can't turn them on and off very easily," he says.

"They are also similar in that they have high investment costs and low running costs, so you want them to be running as much as possible; they are competing for the same share of the market."

This suggests there is a natural ceiling for the amount of generation from nuclear and renewables together.

Britain will still need the flexibility of fossil fuel-powered stations, switched on and off relatively easily; and that implies a need sooner rather than later for carbon capture and storage, for which government support has been lukewarm.

Done deal

Despite these objections, the government has made up its mind.

The technology is there, with four designs competing for a share of the UK market.

Opponents maintain that the nuclear industry has a history of cost overruns - and that this is demonstrated in the new Finnish reactor being built at Olkiluoto, which is said to be two years behind schedule and 50% over budget, just two years after construction began.

But in the new British system, this will be a problem for the

industry, not for the government.

Though differences remain with Labour over some of the details, the Conservatives have given their overall blessing, which is a key factor when construction timelines are long enough that governments can change two or three times before the first megawatt emerges.

Scotland for the moment will not be hosting any new stations; but that should not be a major issue, as operators have indicated a preference for building within striking distance of the major English population centres.



Finland buries nuclear past

The sites are likely to be at or near existing reactors.

Early indications are that some local groups and councils will be actively seeking to bring new reactors - Anglesea council, for example, is desperate to acquire a replacement for the ageing Wylfa facility and the jobs it generates.

The major weapon that anti-nuclear activists used to delay projects in the past, the public enquiry, is likely to become obsolete under proposed changes to planning procedures.


There will be protests, certainly vehement, perhaps involving physical force. Greenpeace is examining the possibility of legal challenges to the White Paper.

But it appears there is little that can now stop the new wave of building - provided that the rest of the industry agrees with EDF that the financial case adds up.

"Has the government done enough?" asks Mark Hughes.

"I can only answer that in the context of what I see people doing; and we know that every one of the big companies is taking nuclear very seriously - they can't afford not to."

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