Plugging the hole: How can solar fill UK nuclear's void?

UK | When Hitachi suspended development of its planned new nuclear power plant at Wylfa in early 2019, many thought the news would blow a hole in the country's decarbonisation plans. But as costs continue to fall, even the UK government, not usually considered to be renewables' closest ally, has pointed to the technologies' role in plugging that gap. Liam Stoker looks at what might be required

Credit: Horizon Nuclear Power

The UK has had something of a rocky relationship with new nuclear in the past few years, but developments in January 2019 pushed it firmly into 'it's complicated' territory, and sent the country scrambling for alternatives.

Horizon Nuclear Power, the Hitachi division response for the development of a new nuclear power station at Wylfa in Wales, ended months of speculation in January by confirming that it had indeed suspended the project's development. Falling just short of scrapping the programme altogether, Duncan Hawthorne, chief executive at Horizon, squared the decision solely at its difficulty in identifying financial partners.

"As a result we will be suspending the development of the Wylfa Newydd project, as well as work related to Oldbury [the company's other site in Gloucestershire], until a solution can be found. In the meantime we will take steps to reduce our presence but keep the option to resume development in future," Hawthorne said.

It was a decision which, according to Emma Pinchbeck, chief executive at Renwable UK, risked "blowing a hole" in the government's carbon reduction targets.

Of course, it's not the only time there's been a sense of fallout from new nuclear plans in the UK. The oft-derided Hinckley Point C saga has proven so controversial that the project can barely be mentioned in passing without attracting significant ire. Even the UK government's own spending watchdog, the National Audit Office, slammed its approach to pushing the plant over the line.

And, at £92.50 per megawatt hour (plus inflation, which sends the 2019 strike price to £99.87) you can perhaps understand why. That's the strike price the government agreed to when negotiating with EDF Energy over the 3.2GW plant which commenced construction last year. Hinkley Point C is indeed a landmark project, as it's one of the most expensive baseload energy generation projects on the planet.

The suspension of one of a new fleet of nuclear power stations in the UK has created a big opportunity for solar and wind

As the cost of intermittent renewables and battery storage technologies continue to fall, it's entirely within reason that questions are starting to be asked. And, now, it's the UK government asking them as well.

The new energy landscape

The UK's energy secretary Greg Clark was surprisingly candid when discussing the suspension of Wylfa, revealing how discussions with Hitachi had sought to progress in the months leading up to the decision. He stated how the government was prepared to take a one-third equity stake in the project, that it was willing to consider providing all of the required debt financing to complete construction and that it was to line up a contract for difference (CfD) to guarantee the project a price for its output in much the same vein as it did Hinkley Point C.

In short, the government was willing to bend over backwards to get Wylfa signed, sealed and delivered. And with good reason, ex-NextEnergy Capital MD and UK energy sector stalwart Abid Kazim, says: "There is a political will to build nuclear… because it buys votes. Hinkley Point C created 3,500 jobs in an area that swung from Labour liberal to Conservative. It's gerrymandering."

But, Clark revealed, any strike price for Wylfa was to be "no more [than] £75/MWh", indicating how the British government was, finally, expecting to see some kind of return on its support for the technology. Clark's insistence that he could not justify going above it "given the declining costs of alternative technologies" would suggest that the establishment's patience is wearing thin.

Renewables subsidies have been a

contentious topic in British politics since the Conservative Party swept to an election majority in 2015 and proceeded to swing a great green axe at renewables support mechanisms in the name of protecting consumer bills. The last of the country's solar subsidies are to close at the end of March 2019, heralding the dawn of the post-subsidy era. And, as contentious as they may have been, the cost reductions seen in solar and wind in the UK have been nothing short of remarkable.

That the UK government expected similar to happen in nuclear is open for debate, but Clark was steadfast in his opinion that the evolution of renewables had changed the energy landscape for good.

"We have also seen a strengthening in the pipeline of projects coming forward, meaning that renewable energy may now not just be cheap, but also readily available… Across the world, a combination of factors including tighter safety regulations has seen the cost of most new nuclear projects increase, as the cost of alternatives has fallen and the cost of construction has risen.

"This has made the challenge of attracting private finance into projects more difficult than ever, with investors favouring other technologies that are less capital-intensive upfront, quicker to build and less exposed to cost overruns," Clark said.

So with the UK government seemingly closing the door on expensive new nuclear plants and firmly opening it for much cheaper renewables, where does solar stand?

Reigniting deployment

The government shouldn't have to look far for advice. The Committee on Climate Change, the UK's climate watchdog, published a progress update last year that, amongst a raft of other issues, advised on the level of low-carbon generation required to meet the targets laid out in the government's carbon budgets, key pieces of legally binding legislation that map out the country's progress towards a low carbon economy.

Last year's progress update stated that should Hinkley Point C begin generating power on schedule – which in itself is open for debate – and no further new nuclear plants come on stream, then an additional 50-60TWh of low-carbon generation will be needed throughout the 2020s. With Wylfa's suspension, this looks like a job for wind and solar.

The UK's Energy and Climate Intelligence Unit (ECIU), a non-profit organisation that compiles research and analysis on energy matters, published a briefing to coincide with Wylfa's suspension that sought to demonstrate the role renewables could play in replacing it.

Key numbers

60TWh – The amount of new low-carbon generation required by 2030 in the UK

20% - The share of this that could be provided by solar PV, according to the ECIU

£50-65/MWh – The average LCOE of wind and solar PV in that bracket

15-33% - The expected discount on the cost of new nuclear

The ECIU assessment argues that a suite of renewables technologies – 80% provided by onshore and offshore wind, 20% by solar PV – would provide the same equivalent firm capacity as the prospective Moorside, Wylfa and Sizewell C nuclear stations at an average price of £50-65/MWh, including the cost of system balancing such intermittent generation would require.

> "Hinkley Point C created 3,500 jobs in an area that swung from Labour liberal to Conservative. It's gerrymandering"

System balancing and security of supply are often a stick to beat renewables with but, as BayWa r.e.'s Benedikt Ortmann suggests, experience from Germany would attest that it's a bit of a fallacy. "There's empirical evidence on this already. In Germany, always there's a discussion from the utilities that says, 'Oh, what happens if it's dark and the wind is not blowing, then the country will go bust'. But empirical data shows the opposite, that more renewable energy we add to the system, the more stable the system is," he says.

Should solar PV indeed look to fill 20% of that shortfall, it would equate to some 12TWh of power being required from new-build solar. Again, using CCC estimates, that would require an additional 13GW of solar capacity in the UK, essentially doubling what has already been energised on the country's rooftops and fields.

And, what's more, such an average price is representative of a 13-33% discount on the cost of new nuclear. So not only could new renewables replace Wylfa, but it could do so as much as one-third more cheaply while reigniting the UK's solar and onshore wind industries. If that's the case, then subsidies may begin to look like an increasingly good deal for the UK consumer.

Review the policy

Pinchbeck insists that renewables can step into the void, but those technologies cannot simply go it alone. "As the cheapest source of new power, onshore wind can make a major contribution to the UK's clean growth ambitions. We have a pipeline of shovel-ready onshore wind projects that can provide cheap power to consumers and help close the gap on our carbon targets and it's time government allowed onshore wind to compete on a level playing field, including letting projects compete for contracts for difference."

Pinchbeck is referring to the Conservative government's principled blocking of onshore wind developments, a manifesto promise that remains one of the very few consistencies in British politics of the last four years. As other articles in this magazine will attest (see p.50 for more information on how subsidy-free CfDs could stimulate UK solar deployment), the policy landscape in the UK is far from conducive to an extra 13GW of solar PV being connected in the next 11 years.

Lawrence Slade, the chief executive of utility trade association Energy UK, was however more measured, insisting it was disappointing to see work at Wylfa suspended. "It is important that low carbon, secure sources of generation, such as nuclear, can get the necessary investment to enable them to help meet the energy needs of consumers and our country over the coming decades. Therefore we urge the government to continue to work with the energy industry and investors to ensure projects like this can go ahead," he said.

As is so often the case, the UK market has come to serve as a microcosm for the global energy sector. A transition is occurring at great pace and, in early February, yet another coal plant was revealed to be closing early. With new nuclear projects falling by the wayside, new renewables will have to come to the fore.

And with just a little nudge from government, all the empirical evidence, analysis and statistics suggest that by 2030, the UK could have a generation sector fit for the future. ■