

New nuclear: a flawed fantasy

With the government committed to a huge expansion of nuclear power to meet our energy needs, Andrew Blowers and Stephen Thomas contend that this is an uneconomic, unachievable and undesirable solution that is doomed to fail

In 2022, the then Conservative government set a target of having 24GW (gigawatts) of new nuclear capacity up and running by 2050, despite the dismal history of cost and time over-runs experienced in developing the existing plans. If achieved, this would be the equivalent of having eight more Hinkley Point Cs. The succeeding Labour government reaffirmed its commitment to nuclear power in its manifesto, proclaiming that a scale expansion ‘will play an important role in helping the UK achieve energy security and clean power’.¹ Neither government was prepared to recognise that the Great British nuclear expansion is a project bound to fail.

No amount of political commitment can overcome the lack of investors and the absence of credible builders or reliable technologies for nuclear development. Expansion at such a scale will require rigorous regulatory and planning scrutiny that should not be skimmed. In an era of climate change there will be few suitable sites to host new nuclear power stations and radioactive waste stores for indefinite timescales on vulnerable sites.



The massive dome of Hinkley Point C's first reactor being lifted into place by 'Big Carl' – the world's largest land-based crane

© Courtesy of EDF



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View from
inside cooling
water tunnel
workings at
Hinkley Point C

© Courtesy of EDF

Unaffordable

At a time of severe fiscal constraint required by the £22 billion 'black hole' in the country's finances, new nuclear is more unaffordable than ever before. Nuclear energy has consistently proved to be a bottomless pit, with ever-rising costs, lengthening delays and repeated failures. Hinkley Point C has doubled in cost and will be at least 12 years late when it begins operating. Its successor, Sizewell C, has already cost the Treasury £2.5 billion, with a further subsidy of £5.5 billion announced just to get the project to a final investment decision (FID) forecast for this year. The FID has been said to be 'imminent' for the past four years.

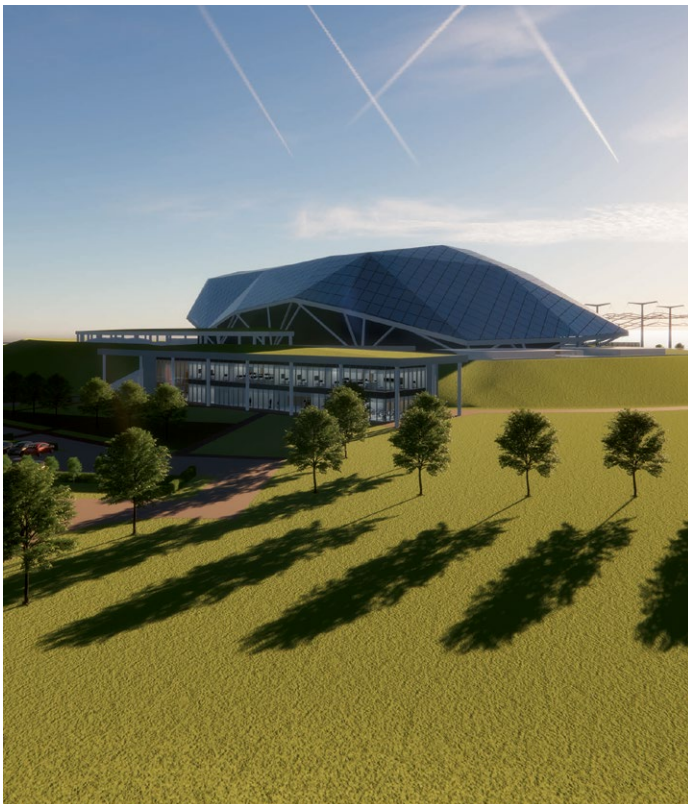
To prevent the Sizewell C project collapsing, the government has chosen to contribute about 92% of the cost of getting it to FID, as well as taking a major (and probably majority) stake in the plant. The government began to order components for Sizewell C over two years ago, which, if it does not go ahead, risks taxpayer money being lost. Under the financing model proposed, regulated asset base (RAB), consumers will start paying for the plant from the day of FID, long before they receive any power from it. The risk of cost escalation during

construction will fall on them. For Hinkley Point C, French energy supplier EDF Energy took this risk, and as a result has had to write off €12.9 billion of its investment. This subsidy to Sizewell C would place an immediate extra burden on vulnerable consumers already facing higher energy prices and the loss of winter fuel payments – the subsidies for Sizewell C would have paid for at least six years of winter fuel payments.

Lack of investors means that large nuclear reactors beyond Sizewell C are unlikely, so attention has turned to small modular reactors (SMRs) as the latest episode in the Great British nuclear fantasy. Portrayed as cheaper, quicker to build and safer, they are simply old wine in newish bottles. None has been ordered, built, operated or completed comprehensive safety evaluation anywhere in the world, so the claims are just pious hopes. The first task for the newly created Great British Nuclear is to run a competition to identify the two best SMR designs for deployment by the mid-2030s. So, even if they were economic and reliable, follow-on plants would only come on-line well after 2040, far

too late to make a significant contribution to achieving net zero. Meanwhile, money is being sunk into the competition and around £20 billion of taxpayers' money will be needed to bring them to development and pay for a handful of reactors. Investment on such a scale, using designs that are untried, untested and will materialise too late, is foolish. The next stage should have taken six months and was completed in spring 2024, but it is running at least a year late.

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Conceptual
image of Roll-
Royce's Small
Modular Reactor
© Rolls-Royce SMR



Unachievable

New nuclear expansion requires thorough regulatory and planning processes. Generic design assessment (GDA) is a process for assessing whether a reactor design is capable of safe deployment in the UK. It takes about four years to achieve GDA approval from the regulators, the Office for Nuclear Regulation (ONR) and the Environment Agency (EA). As well as generic design, a specific project will require a site licence from the ONR, an environmental permit from the EA and planning approval in the form of a Development Control Order (DCO), as a nationally significant infrastructure project from the relevant secretary of state. All these processes must be carried out rigorously but this takes time, and there is considerable scope for delay, review and refusal. The government's solution to these problems is always the same. New reactor designs will solve the problem of past designs; red tape will be cut, and planning and regulatory processes will be streamlined. The government has taken aim at the 'blockers' who allegedly have stalled progress of projects such as Sizewell C. In reality, this project has yet to achieve financial backing to proceed,² and the delays are down to the government's inability to design a financing model that will attract investors.

Lack of available sites for new nuclear projects is a further constraint on expansion. Claims by ministers that sites are 'oven-ready' are simply untrue. There are just six 'potentially suitable' coastal sites carried over from the previous failed expansion programme. None have achieved DCO, not all have appropriate grid connections, few have a localised skilled workforce, nor can it be claimed they have widespread public support. In most cases, the opposite is the case. Above all, the impact of climate change, sea-level rise, storm surge and coastal processes could cause potential degradation of sites during a century or more of operation, decommissioning and waste management.

To address the siting issue, the government has proposed to replace its strategic siting strategy with a developer-led, criteria-based alternative siting strategy. The intention is 'to support nuclear infrastructure development on a more diverse

range of sites, reflecting the emerging diversity in nuclear technologies'.³ The set list of sites will be scrapped, although they will be promoted as potentially suitable. It is hard to see how such a hybrid, free-for-all approach is likely to yield suitable and acceptable sites, beyond the usual and diminishing suspects that are already being dangled in front of biddable developers. While developing more sites 'seeks to help achieve the government's policy to mitigate climate change',⁴ nuclear infrastructures are at risk from rising temperatures and sea levels, which will reduce the availability of suitable sites. Lack of suitable sites in an era of climate change is coming into focus as the big hole at the heart of a major expansion of nuclear energy.

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Protestors line up along the fragile Suffolk coastline to demonstrate the extent of massive sea defences proposed for Sizewell C

© Brian Lowry,
Stop Sizewell C



Undesirable

The management of highly radioactive wastes has always been and remains a central issue of public concern. The first generation of nuclear power stations in Britain is now being decommissioned, a process likely to last until the 2080s. It will be well into the next century before the sites of the last of the operating stations will be cleared. For new power stations, such as Hinkley Point C that will begin operating in the 2030s,

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it will be near the end of the next century before final site clearance and disposal of wastes in a deep repository (if one is available) can be accomplished. Therefore, building new nuclear power stations extends the timescales of waste management on vulnerable sites into the unknowable future, imposing undesirable and unnecessary risks on far-future generations.

Fear about radioactivity released into the environment is a persistent reason for opposition from communities living close to nuclear plants. There is also the more general dread of the cataclysmic mega risk of major accidents on the scale of Chernobyl and Fukushima. This has been compounded by more recent fears of catastrophe that nuclear foments. The vulnerability of nuclear power plants to cyber-attacks, AI, and deployment of drones, terrorism and war have been vividly brought into focus by threatened nuclear plants in Ukraine (Zaporizhzhia) and Russia (Kursk).



✓ Construction of Hinkley Point C started in 2018, but a completion date has yet to be confirmed

© Courtesy of EDF

The need for a large new nuclear programme has been taken by successive governments as a given, and its rapid deployment as an overriding priority for the UK's energy and environmental security. The negative aspects of an expanded nuclear programme have been subordinated. It is the long-standing and fundamental concerns about managing the nuclear legacy, its intrinsic risks to safety and security, and the increasing threats from external natural (climate change) and geopolitical forces that make nuclear ultimately an undesirable prospect for a sustainable energy future.

Announcements of large programmes of nuclear reactors are often made, and not just in Britain. They either fail completely or result in a few white-elephant reactors. This will happen with the 24GW British nuclear programme. The cost will be more than a decade squandered on finding out that the project is not feasible or desirable. The financial and human resources wasted would be better deployed on alternatives that are affordable, achievable and, above all, suitable for the age of climate change and net zero.

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Notes

- 1 'Change'. Labour Party Manifesto. 202, p.52 <https://labour.org.uk/wp-content/uploads/2024/06/Labour-Party-manifesto-2024.pdf>
- 2 *Government rips up rules to fire-up nuclear power*. Press release. Department for Climate Change and Energy, 6 Feb. 2025. <https://www.gov.uk/government/news/government-rips-up-rules-to-fire-up-nuclear-power>
- 3 National Policy Statement for Nuclear Energy Generation EN-7, Department for Energy Security and Net Zero, February 2025, p.10. <https://assets.publishing.service.gov.uk/media/67a4d7c30e720adbd4f6adf4/national-policy-statement-en7-nuclear.pdf>
- 4 Ibid. p.15