

**Why new nuclear is a bad idea**

The UK Government has commendably set a ‘net zero emissions’ target in law. The case nuclear advocates make is that the grid system will not be able to cope with only having variable renewable power like wind and solar. This is unlikely for two main reasons.

Firstly, the proportion of zero carbon power that can be delivered by renewables has climbed as smart technology and understanding of how to manage the system has improved. The estimated maximum has gone from [single figure percentages](https://twitter.com/JohnMurton/status/1268111336447389697) twenty years ago, through [33-48%](https://investors.nationalgrid.com/~/media/Files/N/National-Grid-IR/reports/future-energy-scenarios-2015.pdf) in 2015, to a 2020 statement from the National Infrastructure Commission (NIC) that [65% renewables by 2030](https://nic.org.uk/news/falling-cost-of-renewables-strengthens-case-for-accelerating-deployment/) is *cost-effective* - not the limit of what is achievable. The proportion of wind and solar is only likely to keep increasing as the collapsing cost of [batteries](https://about.bnef.com/blog/battery-pack-prices-fall-as-market-ramps-up-with-market-average-at-156-kwh-in-2019/), other [forms of storage](https://www.theguardian.com/environment/2020/jun/18/worlds-biggest-liquid-air-battery-starts-construction-in-uk) and [green hydrogen](https://about.bnef.com/blog/hydrogen-economy-offers-promising-path-to-decarbonization/) allow ever greater proportions to be managed. Insisting on a new nuclear component for this purpose is a bet on that trend stopping. Given the earliest a Sizewell reactor would be supplying power would be [2034](https://www.thetimes.co.uk/article/sizewell-c-faces-six-year-emissions-lag-xm72b92tb), technological advances could make it a white elephant before it opens.

Secondly, in 2021 there have already been three energy system models by established academics or consultancies that demonstrate no need for new nuclear stations in the UK power system, and that decarbonisation with system security is probably cheaper without it.

a) [Imperial College Energy Futures Lab](https://www.imperial.ac.uk/news/223373/uk-offshore-wind-target-must-least/). The model used[[1]](#footnote-1) was one that ensures adequacy of power generation, using real world weather data to indicate the levels of wind and solar power generation on an hour-by-hour basis. New nuclear was not on the cost effective pathway.

b) Energy Systems Catapult[[2]](#footnote-2) for [Good Energy](https://www.goodenergy.co.uk/business/exclusive/renewable-nation). The modelling was done using the Energy Systems Modelling Environment, or ESME[[3]](#footnote-3), and again was able to model the energy system on an hour-by-hour basis to ensure adequate supply.

c) energy consultancy LCP Energy[[4]](#footnote-4) for the [energy company SSE](https://insight.lcp.uk.com/acton/attachment/20628/f-d32a3b26-13a3-4334-9d7f-0cb5634e5b9d/1/-/-/-/-/Net%20zero%20without%20breaking%20the%20bank%20-%20LCP%20SSE%20report%202021%20.pdf). Like the other models referred to above, it maintains the current system security standard (‘no blackouts’) whilst carbon intensity of GB power system approaches near zero in the 2030s, to be low cost whilst having credible assumptions on technology build rates and cost reductions.

**But won’t new nuclear help us get to ‘net zero’?**

Even if we set aside the downsides of nuclear such as nuclear waste, weapons proliferation, risk of terrorist attack etc, won’t nuclear power be an asset in getting to zero emissions? Nuclear produces low carbon power, but including it in our energy mix has consequences which may make overall decarbonisation harder.

1. Nuclear is not cost-effective, and the more that is spent by government on things that might not be cost-effective, the harder the job of delivering net zero.
2. [A count of civil servants](https://www.theyworkforyou.com/wrans/?id=2020-10-08.100928.h&s=nuclear+speaker%3A24910#g100928.q0) showed that there are more civil servants working on nuclear than there are working on renewables and clean heating combined, despite the latter two being essential. This is illustrated by the commitment of £400mn in the Net Zero Strategy for heat pumps versus billions to deliver Sizewell C. Money and time is siphoned off whilst essential items like renewables and heat pumps that need policy and cash support to scale at speed are languishing.

**The reactor EDF proposes for Sizewell - the EPR**

The proposed reactor at Sizewell, the EPR, has a dismal performance record on costs and punctuality. Both [Hinkley Point C](https://www.theguardian.com/uk-news/2019/sep/25/hinkley-point-nuclear-plant-to-run-29m-over-budget) and [Flamanville](https://www.neimagazine.com/news/newsflamanville-3-startup-pushed-back-to-2024-7853088%20and%20https%3A/www.lemonde.fr/les-decodeurs/article/2019/06/24/epr-de-flamanville-visualisez-comment-le-cout-et-la-duree-du-chantier-ont-triple-depuis-2007_5480745_4355770.html) EPR reactors are late and over budget. Flamanville is 5.8 times the original quoted cost and 12 years late. The EPR being built at [Olkiluoto in Finland](https://www.world-nuclear-news.org/Articles/Further-delay-in-commissioning-of-Finnish-EPR) is now 13 years late and costs have roughly tripled.

**EDF**

Hoping to strike a good deal with EDF should not rely on their analysis or assurances. EDF was fined €5 million by France’s financial markets authority for spreading false information about the terms of the Hinkely deal. As [the report](https://www.theguardian.com/uk-news/2020/jul/31/hinkley-point-c-french-watchdog-fines-edf-5m-for-false-claims-on-cost) around [this event](https://www.ans.org/news/article-409/edf-fined-millions-for-disseminating-misleading-information-about-uk-nuclear-project/) puts it:

“The fine was handed down amid growing frustration in France over the “unacceptable” delays and cost overruns at [Hinkley], which EDF is building alongside the Chinese nuclear company CGN.”

In part, this is because France’s state auditor has questioned the ability of EDF to construct new reactors within [“acceptable”](https://www.telegraph.co.uk/business/2020/07/11/doubts-cast-edfs-ability-build-power-stations-time-budget/) costs and timeframes. If a decision is taken to finance an EDF EPR at Sizewell, either by RAB or direct funding, these problems become the UK Government’s problem, not those of EDF or the French government.

**The Government risks making the same mistakes as it did with Hinkley**

The Cameron and May Governments allowed themselves to be drawn in to commitments that would be politically embarrassing to retreat from, and dug themselves into a hole from which they could not climb out. As the [National Audit Office](https://www.nao.org.uk/wp-content/uploads/2017/06/Hinkley-Point-summary.pdf) (NAO) put it:

“In September 2016, HM Treasury highlighted how the value-for-money case for HPC had weakened. But it concluded that the legal, reputational, investor and diplomatic ramifications of not proceeding meant it was, on balance, better to continue.”

 However, the NAO also point to a more fundamental flaw in the Government’s approach:

“In a 2008 white paper, the government set out its strategic case for new nuclear build….Since then, the economics of nuclear power have deteriorated.”

It is 12 years since a proper transparent case was made for new nuclear compared to the alternatives in delivering a reliable and efficient zero carbon power system. The case was weak well before the 2016 Hinkley decision, but is continuing to weaken as cheaper renewables, more effective storage and better system management become available. The current Government should review which technologies will serve the UK best in delivering net zero reliably, and levelling up across the country without placing unnecessary financial burdens on households.

**The Regulated Asset Base**

The Regulated Asset Base funding mechanism is a levy on bills during construction, so that consumers pay in advance as construction proceeds. Any financing by HMG of a Sizewell project, either directly or via a Regulated Asset Base (RAB) type mechanism would make cost-overruns the government’s (& the billpayers/taxpayers) problem. Several points should be made about the RAB:

* It is seen by developers as a regulatory [‘commitment device’](https://www.oxera.com/agenda/the-regulatory-asset-base-and-regulatory-commitment/) which helps attract investors. Thus it binds government into a project, even when it turns out to be poor, as National Audit Office found with Hinkley[[5]](#footnote-5). In other words, by adopting a RAB approach, Government is making one of the same strategic mistakes as it did with Hinkley
* The RAB transfers large amounts of risk to the public sector, which, depending on the structure of agreement, includes covering for project mismanagement or technological failure on the part of the builders. As the National Infrastructure Commission [says](https://www.theguardian.com/business/2019/jul/27/despite-hinkley-new-plan-nuclear-hardly-better-than-old-one):

*“This makes projects appear cheaper as consumers are effectively financing the projects at zero interest. At least some of the risk associated with construction costs also sit with consumers, a further hidden cost, since consumers are not paid to hold these risks in the way investors would be”*

* A RAB requires a strong, well informed regulator to tackle excessive transfer of risk to the public and excessive returns. The RAB calculations involve estimating opaque future scenarios, such as construction times or problems which affect cost and prevailing economic conditions. But the likely regulator (Ofgem) has [admitted](https://www.theguardian.com/business/2019/oct/03/energy-network-firms-allowed-to-make-bigger-than-expected-profits-ofgem-admits) it has allowed double digit returns to a very low risk business in power distribution even after 2 decades of regulatory experience. The prospect of Ofgem – or any other regulator – getting nuclear right with a one-off project seems remote, as generally commercial developers know much more about real project costs than regulators. As the [Energy and Climate Intelligence Unit](https://eciu.net/blog/2018/where-next-for-uk-nuclear) put it:

*“Vastly more complicated than the CfD system, the RAB model has long been criticised for opacity, with governments and regulators struggling to keep up with specialist consultants and accountants constantly pushing for minor rule changes to favour asset owners.”*

* A mechanism similar to the RAB was used to finance a nuclear power station in South Carolina, which collapsed and will not be built. Notwithstanding this, those payments for the nuclear power station that will never generate power still make up about [18% of customers’ bills](https://www.worldnuclearreport.org/The-World-Nuclear-Industry-Status-Report-2018-HTML.html#fig28)
* The NAO has also said that using a RAB model for nuclear new build could help achieve a strike price of £63.50 and £67.50, although these low prices are only possible because of large levels of risk transferred to the public purse, a subsidy not required for the major forms of renewable generation. Note that even these prices, with their massive transfer of risk not required by other generators, are not low enough to put new nuclear power on the cost-effective pathway to decarbonisation as modelled by Imperial College.

The Economics Editor of [the Guardian](https://www.theguardian.com/business/nils-pratley-on-finance/2019/jul/23/lets-face-it-nuclear-power-is-hideously-dear-and-far-from-ideal) points out:

*“no financing model can disguise the core truth about nuclear – the technology is hideously expensive….. the UK shouldn’t rush to tie itself to an expensive nuclear future and should instead back renewables, notably wind and solar, to continue becoming cheaper.”*

And even more bluntly, the Economics Editor of [the Times](https://www.thetimes.co.uk/article/sinking-nuclear-raft-needs-scuttling-p0qmqs28b):

*“[the RAB] might avoid a re-run of Hinkley saddling consumers with rip-off bills decades out, but only at the price of leaving them exposed to construction risk. ….Under the proposed RAB scheme, energy bills will increase to pay for nuclear power stations before they start generating. In short, we’ll be paying upfront for EDF’s routine screw-ups.”*

1. Imperial College used Whole-electricity System Investment Model (WeSIM), described as “a comprehensive system analysis model that is able to simultaneously balance long-term investment decisions against short-term operation decisions, across generation, transmission and distribution systems, in an integrated fashion” [↑](#footnote-ref-1)
2. Energy Systems Catapult describes itself as “an independent, not-for-profit centre of excellence that bridges the gap between industry, government, academia and research. We take a whole-systems view of the energy sector” and is core funded via UK Research and Innovation [↑](#footnote-ref-2)
3. ESME is described as “a staple of UK energy systems analysis for many years. It is a peer reviewed, least-cost optimisation model designed to explore technology options for a UK energy system with carbon constraints applied” [↑](#footnote-ref-3)
4. LCP Energy provides “energy market expertise, mathematical modelling and new technological approaches to the GB and Irish electricity markets” and describes the modelling used as “Our analysis is supported by our in-house modelling framework, which is used by both industry and policymakers. It is the primary power market forecasting tool used by BEIS to assess the impact of changes to energy policy. It is also used by National Grid to model system security and produce their annual recommendations for the capacity auction requirements, by Ofgem to assess changes to charging arrangements, and by the LCCC to set the costs to suppliers of the Contracts for Difference scheme”. <https://www.lcp.uk.com/energy/> [↑](#footnote-ref-4)
5. See <https://www.nao.org.uk/wp-content/uploads/2017/06/Hinkley-Point-C.pdf> “In September 2016, HM Treasury highlighted how the value-for-money case for HPC had weakened. But it concluded that the legal, reputational, investor and diplomatic ramifications of not proceeding meant it was, on balance, better to continue with the deal.” [↑](#footnote-ref-5)