AVOID A NUCLEAR WHITE ELEPHANT

Redirect Sizewell C Funding to “Warm homes”

A joint Stop Sizewell C and Green New Deal Group paper

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Acknowledgements

This paper was written by Alison Downes of Stop Sizewell C and Colin Hines of the Green New Deal Group.

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This paper is dedicated to the memory of Pete Wilkinson (Wilx), 21st November 1946-21st January 2025.
A tireless campaigner against nuclear power and Sizewell C.

https://stopsizewellc.org/

https://greennewdealgroup.org/

REDIRECT SIZEWELL C FUNDING TO 'WARM HOMES'

Swap Sizewell C for warmer homes and jobs in every constituency by the next election

Summary

There is a clear political advantage from halting Sizewell C and redirecting the billions saved into making millions of homes more energy efficient, thus reducing fuel poverty. This approach will benefit every city, town, village and hamlet in Britain.

It will generate long term, secure jobs, particularly for young people. It will be quick to implement, so by the next election new jobs and cheaper, warmer, healthier homes will have appeared in every constituency.

By contrast, continuing to build Sizewell C will affect a limited number of constituencies.

Should Sizewell C go ahead, it is expected to cost around £40bn between now and when it opens, potentially around 2040: an average of £2.7bn per year for the next 15 years. Deducting money already spent, if Sizewell is cancelled now, the public money saved by 2030 is £7.1bn, assuming (as seems likely) no private investors are found to share the costs.

We propose that this £7.1bn should be added to the £6.6bn to be spent over the current Parliament on home energy efficiency, as promised in Labour's 2024 manifesto. This shift of funds would massively increase the chances of achieving the Government's aim to '*Make Britain a clean energy superpower to cut bills, create jobs and deliver security with cheaper, zero-carbon electricity by 2030, accelerating to net zero*'.

SECTION A. The Cost

1. The costs of the Sizewell C, twin "GW" EPR reactors on the Suffolk Coast, are likely to be twice as high as initially thought. It is not credible that Sizewell C can be built for a fraction of Hinkley C's cost as claimed, or on time.

For this report we assume that Sizewell C will cost £40bn, as reported by the Financial Times on 14 January 2025 citing government and industry sources. Despite an inconclusive denial that Ministers and Sizewell C "did not recognise this figure", analysis from UBS, advisers to potential investor Centrica, also supports it. The Government has refused to publish cost estimates or a target completion date for Sizewell C, citing commercial confidentiality, but this excuse for the headline cost is hard to understand.

The only finance going into the project since December 2023 – when project-owners EDF stopped contributing after spending £660m – has come from UK taxpayers. In 2022 the Government invested £700m; in 2023, £500m; and in January 2024, £1.3bn. In August 2024 it created a further Final Investment Decision (FID) subsidy scheme with a total value of £5.5bn, with the first tranche of £1.2bn paid in September 2024, making the total taxpayer spend to date £3.7bn with significant headroom remaining. The Autumn Budget included a separate allocation of £2.7bn for the financial year 2025/26.

All this for a project that has a very uncertain delivery schedule. No European Pressurised Reactor (EPR) project has ever been completed even close to budget or on time. All six EPR reactors worldwide have or will cost at least double their expected budgets and are, or have been, six to 14 years late. The case of Hinkley Point C is especially stark: EDF's most recent estimates of the construction cost is up to £35bn[2015], or £46bn in 2023 money – almost double its £18bn[2015] budget when the FID was taken in 2016. These costs do not include financing costs, which EDF has said might double the total construction cost. Hinkley's Unit 1 is now delayed to between 2029 and 2031, four to six years late, with the second reactor at least a year behind. EDF has made five cost and completion revisions for Hinkley since FID, and with several years to go, it is implausible that there will not be further revisions.

"All six EPR reactors worldwide have or will cost at least double their expected budgets"

EDF claims that Hinkley Point C is "First of A Kind" (FOAK), and that Sizewell C will benefit from replication and "learning" which would reduce construction time and cost. However, Hinkley's reactors are the 5th and 6th EPRs globally and Sizewell C would be the 7th and 8th – and almost certainly the last, as France moves to the significantly modified EPR2

Sizewell B nuclear power station. © Copyright Brian Robert Marshall and licensed for reuse under this Creative Commons Licence.

design. Taishan 1 & 2 in China took well over double the predicted build time and were reportedly 50% over budget. Olkiluoto 3 in Finland was 14 years late and three times over budget, and Olkiluoto 4 was cancelled. Flamanville 3 in France came online (though is not yet up to full power) 12 years behind schedule and four times over budget; £11.2bn [2015] for a single reactor. These repeated failures suggest that learning from previous EPRs has not happened, and at £17.5bn[2015] for each of Hinkley's two reactors, replication seems to have *increased* cost.

EDF's claims about replication overlook the inconvenient fact that the site cannot be replicated. Sizewell C's site has been described by a senior source from the Office of Nuclear Regulation (ONR) to the Stop Sizewell C campaign as "expensive to develop" compared to Hinkley C. The complex groundworks and extensive sea defences required raise questions about the accuracy of cost estimates. Sizewell C will also pay a lump sum to Hinkley C to share "FOAK" costs to the tune of £1.4bn, according to France's State auditors, the Cour des Comptes. In return, the Hinkley strike price of £92.50/MWh[2013, index linked, so over £127 today] will fall to £89.50/MWh.

With so much uncertainty, it is not surprising that investors appear to be hard to come by. Six shortlisted investors have been reported, but all are remarkably quiet, with the exception of Centrica which is pushing for the "right" risk/return structure. Media speculation suggests that Centrica could take 10% of Sizewell C, but with EDF seemingly looking to reduce its possible stake from 19.99% to 10%, the hole that must be filled remains unchanged.

2. Sizewell C would increase bills, and it is questionable whether it could offer consumers and taxpayers value for money.

Use of the Regulated Asset Base (RAB) model for Sizewell C would increase household bills immediately a FID was taken and continue into the 22nd Century, when the plant is forecast to be retired. RAB would require residential consumers to contribute to Sizewell C's construction, potentially financing half the total construction cost.

The allocation of construction risk onto households is controversial for an inherently risky project and industry. Citizens' Advice is concerned not just about the cost of capital, but also the volume of capital, stating that "the project may offer consumers poor value for money even if it is cheaply financed. Consumers may also be on the hook for any delays in the delivery of the project". In July 2023 the Science Information and Technology Committee said of Sizewell C: "A headline lower cost than Hinkley Point C is not justified if the value of the risk is too great."

As an indication of project risk, in 2024 EDF was forced to write off €12.9bn of its investment in Hinkley Point C because of cost and time overruns. Under RAB, these costs would have fallen on consumers. There is no information in the public domain concerning proposed risk allocations for Sizewell C, let alone headline cost.

3. Backing Sizewell C would continue UK dependency on foreign states and EDF's reactor is known to be unreliable, undermining energy security.

The Cour des Comptes expressed concern about EDF overreaching itself and warned that EDF must not take on excessive commitments or risks internationally (p 10 of hyperlink). Specifically, they recommended EDF should not take a FID on Sizewell C until it had reduced its financial exposure at Hinkley Point C. Sizewell C might further be dependent on foreign powers that do not share the UK's values through its ownership, with UAE state-owned ENEC being wooed to take a stake, despite numerous political differences, including the red carpet welcome it afforded to Vladimir Putin in 2023. This is aside from the UK nuclear industry's continued reliance on Russian fuel.

EPR reactors have not performed well. Taishan 1 in China did not operate satisfactorily for three years of its first five years of service according to the Cour des Comptes, and French regulators are still demanding as yet unfinalised design changes at Flamanville to limit core vibration (p6). Olkiluoto suffered repeated problems during 17 months of testing, entering commercial operation in April 2023, with an extended outage after 12 months and a number of unexpected shutdowns in the autumn of 2024. Flamanville 3 is not yet at full power. The power source that gives least security is that which is running late and not complete, or offline for extended outages.

The total cost of Sizewell C to date has been £3.7bn, with a further £4.3bn headroom; potentially £40bn in total, plus finance costs.

4. Would Sizewell C reduce Systems Cost and is it needed?

The inclusion of new nuclear on the grid could increase rather than reduce system costs, as claimed by project leaders and officials. Researchers at Nottingham University found that *"the cheapest way to achieve a zero-carbon electricity system in the UK is through a combination of 'renewables + storage' without having a nuclear baseload in the system". A Royal Society report into large-scale storage (p6) states "Including steady nuclear ('baseload') supply would increase costs.*

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The Department of Energy Security and Net Zero continues to rely on an outmoded Power Sector model (the Dynamic Dispatch Model) for modelling the UK's future energy supply and this includes Sizewell C's Full Business Case, - for example it cannot model storage over 24 hours and can only apply a single wind speed to the entire country. A substantial increase in storage capacity is inevitable whether or not the UK implements a substantial nuclear programme. It would therefore be premature to proceed with Sizewell C if there is a risk that a rerun of the modelling for 2050 with the Department's new Power Sector model (called BID-3, currently being tested) might reveal Sizewell C to be poor value for money and not needed. There are multiple scenarios, by for examples Oxford University's Smith School, UCL and Energy Systems Catapult (Good Energy) that affordably and quickly reach net zero without any new nuclear power beyond Hinkley C. There are also studies that have established that a 100% renewable energy system is possible, eg LUT (Finland).

5. "Mind the (nuclear skills) gap". The sustainability of jobs created in building new nuclear is questionable, and there are other ways to develop skills of value to the British economy.

The lack of availability of nuclear skills is well documented. Sizewell C would be dependent on skills passed on from Hinkley, but the gap between construction commencing at Hinkley C and Sizewell C was intended to be only two to three years, enabling the retention of skilled workers. However the gap has grown to at least eight years. There is little opportunity to implement "learnings'' if Hinkley's skilled workers have inevitably sought employment elsewhere. The Cour des Comptes has also expressed concern about competition for skills regarding plans for six 'EPR2' reactors in France and EDF's other major domestic challenges.

There is no evidence to suggest that non-monetised "value for money" 'benefits' of Sizewell C have been compared to the non-monetised benefits of other paths to achieve net zero.

SECTION B. The Opportunity

1. Sizewell C is poor value for money. There are better alternatives readily available, including reducing energy demand from buildings by investing in a mass retrofit programme.

Should Sizewell C go ahead, it is expected to cost in the region of £40bn between now and 2040, when it might open – an average of £2.7bn per year, or £13.5bn by 2030. The Government and EDF have already spent £4.4bn, so if Sizewell is cancelled now then the money saved by 2030 is £7.1bn. This saving could be added to the extra £6.6bn to be spent over the current Parliament on home energy efficiency, as promised in Labour's 2024 general election manifesto.

The Government has already highlighted the national emergency of rising energy bills and the urgent importance of insulating as many homes as possible as part of its mission to 'make Britain a clean energy superpower', acknowledging: "The UK spends more money on energy wasted through the walls and roofs of our houses than any other country in Western Europe. Upgrading the energy efficiency of homes would reduce energy demand, thereby cutting bills for families and building the UK's energy security."

To tackle this situation, the Government has promised to deliver a national Warm Homes Plan to upgrade millions of homes, installing energy saving measures such as loft and cavity wall insulation, and expanding access to green technologies like solar panels. It has committed an initial £3.4bn for financial years 2025-26 to 2027-28 for its Warm Homes Plan.

This will give devolved governments and local authorities the power and resources to upgrade cold, draughty homes and will create jobs across the country for construction workers, plumbers and installers.

2. The Warm Homes Plan helps those most in need.

The Government has made clear that the energy shock of recent years has highlighted the urgent importance of improving energy efficiency in British homes. It has promised to invest an extra £6.6bn over the next Parliament, doubling the existing planned government investment, to upgrade five million homes to cut bills for families. The Warm Homes Plan will offer grants and low interest loans to support investment in insulation and other improvements such as solar panels, batteries and low-carbon heating to cut bills. Another aim is to ensure homes in the private rented sector meet minimum energy efficiency standards by 2030,

"the energy shock of recent years has highlighted the urgent importance of improving energy efficiency in British homes"

potentially saving renters hundreds of pounds per year.

Labour has highlighted that this approach will save families hundreds of pounds, slash fuel poverty, and get Britain back on track to meet its climate targets. Its plan is also intended to result in good skilled jobs for tradespeople in every part of the country.

3. The Government's Energy Efficiency programme could be transformed by more than doubling its budget to decarbonise and make the UK's 30 million homes and buildings energy-efficient.

Residential buildings are a crucial area to concentrate on, as they are responsible for 20% of the UK's carbon emissions. This focus will also be politically and socially advantageous, since it will generate jobs in every constituency in the UK while improving housing conditions for millions.

The Energy Efficiency Infrastructure Group (EEIG), a broad-based coalition of over 25 industry groups, NGOs, charities, and businesses has called on the Government to put in place powerful tax incentives, alongside expanded green finance, to 'nudge and empower' over 20 million homeowners to improve the energy efficiency of their dwellings. It has also called for an increase in support and funding for more than seven million households in fuel poverty or on lower incomes.

The huge scale of such a programme is seen by their estimation of the 'Installation Gap' that will need to be filled to achieve a 20% reduction in energy use by 2030 for Britain's

A home retrofit project in Nottingham. Photo by Tracey Whitefoot.

residential buildings. This would require an additional:

- ⇒ 6.8 million installations of loft insulation
- ⇒ 3 million installations of floor insulation
- ⇒ 4.6 million solid wall and cavity wall installations
- ⇒ 2 million solar panel installations
- ⇒ 2.5 million homes with heat pumps
- ⇒ 2.1 million homes connected to a heat network
- ⇒ 9.3 million homes with draught proofing and hot water tank insulation.

To achieve this the EEIG has previously detailed the practicalities of such a huge programme in their comprehensive publication *Rebuilding for Resilience*. This shows how the UK could quickly expand existing energy saving capacity and which training programmes and funding mechanisms will be required.

"While these issues threaten the country's ability to maintain even the current levels of energy efficiency work, they also provide huge opportunities for training and job opportunities"

4. Long-term skilled jobs can be created in every constituency

The UK currently has over 150,000 people employed in trades relevant to retrofitting buildings. There is, however, a twin underlying crisis in this sector. The first is the lack of new entrants and the second is a rapidly ageing workforce. While these issues threaten the country's ability to maintain even the current levels of energy efficiency work, they also provide huge opportunities for training and job opportunities for the young, as well as retraining opportunities for those whose jobs are disappearing.

5. The investment would bring political advantages in the run up to the next election

The Energy Efficiency Infrastructure Group (EEIG) estimates that to carry out all of the necessary work needed to dramatically reduce emissions from homes between now and 2030 will require at least 250,000 more tradespeople .

Were the Government to scrap Sizewell C and transfer the £7.1bn saved to making UK homes more energy efficient, this would allow it to fund what the EEIG describes as an ambitious zero-carbon skills strategy, working with industry, unions, schools, and colleges, to tackle any skills gaps that could hinder progress. Examples of required skills include those for designers, builders, and installers of energy-efficient and zero-carbon heating, for which demand will increase sharply. This should also result in a major expansion of high-quality and advanced apprenticeships, backed up with new sector-led national colleges. It will also be necessary to ensure that the financial sector has the skills necessary to make the UK the green finance capital of the world.

Rebuilding for Resilience shows how the UK could quickly expand existing energy saving capacity and which training programmes and funding mechanisms are required. At its heart is a comprehensive Buildings Energy Infrastructure

Programme which EEIG recommends become a national infrastructure investment priority. This would be designed to ensure a rapid improvement in energy efficiency policy for around 30 million UK homes and buildings. The UK housing stock is one of the least efficient in Europe and so tackling this would provide a credible pathway to net-zero emissions as well as ending fuel poverty.

6. First concentrate on the fuel poor, mostly in the left behind regions

The North East, West Midlands, North West, and Yorkshire and the Humber regions of England, along with Wales, have the highest per capita energy efficiency investment need. The incidence of fuel poverty is generally highest in rural areas outside the South and South East – such as in Cornwall, Cumbria, the east coast of England, Lancashire, Lincolnshire and the West Midlands – and in deprived inner-city neighbourhoods including Birmingham, Bradford, Liverpool, Leicester, London, Manchester, Newcastle and Nottingham.

Focusing on energy efficiency, rather than relying on Sizewell C's uncertain and increasingly expensive nuclear reactors, will save voters money and address net zero commitments.