



National Audit Office

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## **Report**

by the Comptroller  
and Auditor General

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**Department for Business, Energy & Industrial Strategy**

# Hinkley Point C

## Key facts

**£18bn**

estimated cost to construct Hinkley Point C (in 2016 prices)

**7%**

proportion of Great Britain's estimated electricity requirement met by output from Hinkley Point C in the mid-2020s

**£92.50**

price (in 2012 prices) to be paid to NNB Generation Company (HPC) Limited (Hinkley Point C's operator) per megawatt hour of electricity generated for the first 35 years

<b>£30 billion</b>	estimated present value in March 2016 of future top-up payments under the Hinkley Point C contract for difference (2015-16 prices discounted to 2015)
<b>9%</b>	the expected return to Hinkley Point C's investors net of the impact of taxation (nominal post-tax equity return on the project)
<b>£10–£15</b>	Department for Business, Energy & Industrial Strategy's (the Department's) estimate of the amount from the average annual household electricity bill that will go towards supporting Hinkley Point C up to 2030
<b>£21–£24</b>	the Department's estimate of the average increase on annual electricity bills up to 2030 if Hinkley Point C is delayed by three years and replaced by low-carbon alternatives
<b>£7.3 billion</b>	NNB Generation Company (HPC) Limited's (NNBG's) estimate of the costs of decommissioning Hinkley Point C and managing its waste (in 2016 prices)
<b>£79.7 billion</b>	NNBG's estimate of the net project cash flows by the end of Hinkley Point C's operational life in 2085 (in 2016 prices)

The timeline for the Hinkley Point C project is shown in **Figure 1**.

**Figure 1**

## Timeline for Hinkley Point C (HPC)

**The HPC project has been in development since 2007**

July 2006	The government's <i>Energy Challenge</i> review sets out potential for new nuclear power build.
September 2007	EDF/AREVA NP submit European Pressurised Water Reactor (EPR) design to the regulator (Office for Nuclear Regulation) for safety checks.
January 2008	Government publishes its white paper – <i>Meeting the energy challenge: A White Paper on Nuclear Power</i> – and, in response, the industry announces plans to develop 16 gigawatts of new nuclear capacity by the end of 2025.
January 2009	EDF purchases British Energy and its eight power stations for £12.5 billion.
April 2009	Government nominates HPC as one of 11 potential sites for a new nuclear power plant.
March 2011	Fukushima disaster prompts re-examination of safety of nuclear power.
July 2011	Government publishes <i>National Policy Statement for Nuclear Power Generation</i> . The Statement identified eight potential sites for the deployment of new nuclear power stations.
November 2012	Government starts exploratory discussions with EDF over the terms of support for HPC.
November 2012	Office for Nuclear Regulation (ONR) grants site licence for HPC.
December 2012	ONR grants design acceptance confirmation for the EPR reactor design.
March 2013	Government publishes nuclear industrial strategy setting out key actions and milestones.
October 2013	Government and EDF agree on strike price for power from HPC of £92.50/MWh (in 2012 prices). <sup>1</sup>
October 2014	European Commission gives State Aid approval decision for HPC project.
September 2015	Government announces £2 billion debt guarantee for HPC.
October 2015	China General Nuclear Power Group (CGN) agrees to invest £6 billion in the project.
July 2016	EDF Board approves the HPC project to go ahead and takes final investment decision.
September 2016	Government approves its deal for HPC after a two-month pause to consider all component parts of the deal.

**Note**

1 Strike price will reduce to £89.50/MWh (in 2012 prices) if EDF takes a final investment decision on its Sizewell C nuclear power station project.

Source: National Audit Office

# Summary

**1** The Department for Business, Energy & Industrial Strategy (the Department) announced on 29 September 2016 that it had reached a deal to support construction of the Hinkley Point C (HPC) nuclear power station. HPC will be the first new nuclear power station built in the UK since 1995. The Department expects that it will generate around 7% of Great Britain's anticipated electricity requirement from the mid-2020s. The Department hopes that the successful conclusion to the HPC deal will also help to generate wider investor confidence and pave the way for other new nuclear projects. The Department sees HPC and other planned nuclear projects as central to its strategic aim of managing the energy 'trilemma': providing a supply of electricity that is secure, isaffordable for consumers and contributes to the UK's statutory decarbonisation target to reduce carbon dioxide emissions by 80% in 2050 compared with 1990 levels.

**2** NNB Generation Company (HPC) Limited (NNBG) will build and operate HPC. NNBG is owned 66.5% by EDF and 33.5% by China General Nuclear Power Group (CGN). NNBG expects it will cost some £18 billion (in 2016 prices) to build HPC, financed in full by its two investors. The first permanent concrete for the power station was poured in March 2017, and EDF expects that it will generate electricity from 2025 to 2085.

**3** In recent years, it has not been commercially viable for private developers to build new generating capacity in the UK, including nuclear power stations, without government support. The forecast revenues available in the wholesale electricity market do not cover the high upfront costs and other risks of building, operating and decommissioning low-carbon power plants. To support HPC, the government has agreed a four-part deal:

- The main element is a 'contract for difference' (CfD). CfDs offer developers greater certainty and stability of revenues, reflecting the cost of investing in low-carbon technologies, by setting a 'strike price' that the developer receives for a set period. For HPC, NNBG will receive £92.50 (in 2012 prices) for each megawatt hour (MWh) of electricity from HPC that it sells into the market for 35 years. NNBG will receive top-up payments if the market price is lower, which are ultimately paid for by electricity bill-payers. Conversely, payments will flow in the opposite direction if wholesale prices rise above the strike price.
- NNBG must set aside a proportion of its revenues, up to the value of £7.3 billion (in 2016 prices), to cover the costs of dealing with HPC's nuclear waste and decommissioning the plant once it stops generating electricity.
- HM Treasury has provisionally agreed to guarantee up to £2 billion in 2018 of bonds that NNBG issues to finance construction, subject to some conditions. EDF has said it does not expect NNBG to use this facility.

- A Secretary of State Investor Agreement (SoSIA) through which the government underwrites the payment of compensation to NNBG if government policy changes result in the shutdown of HPC. If this were to occur, the Department estimates it could cost up to £22 billion (in 2012 prices).

4 The Department subjected the deal to four value-for-money tests: that the return to HPC's investors was fair; that HPC is cost-competitive with other options for generating power; that it brings net societal benefits by reducing the cost of the electricity system; and that it is affordable for electricity consumers. The government's case for proceeding with the deal was also subject to wider strategic, deliverability and affordability considerations.

## **Our report**

5 This report assesses the government's deal for HPC and makes recommendations for how it now oversees the project and how it agrees deals for other major projects. It:

- sets out the terms of the HPC deal, why the government is supporting nuclear power and the Department's approach to negotiating the deal (Part One);
- assesses the Department's case for supporting HPC and how this has changed since it agreed key commercial terms in 2013 (Part Two); and
- describes the residual value-for-money risks of the deal for consumers and taxpayers, and considers how the Department plans to manage them (Part Three).

6 The current structure of the deal means that the costs of HPC will be met by electricity consumers rather than taxpayers. A failure by government to assess the impact of its policies on consumers could lead to consumers facing financial hardship, and unplanned taxpayer support being required. We have therefore considered the financial impact of the deal on consumers as part of our conclusion on value for money. We set out our audit approach in Appendix One and our methodology in Appendix Two.

## **Key findings**

The case for new nuclear

### **7 The government wants nuclear power to form part of a low-carbon generating mix, despite the economics of nuclear power deteriorating in recent years.**

In a 2008 white paper, the government set out its strategic case for new nuclear build contributing to carbon emissions reductions and security of supply, while being cost-competitive. Since then, the economics of nuclear power have deteriorated: estimated construction costs have increased while alternative low-carbon technologies have become cheaper. At the same time, fossil-fuel price projections have fallen, improving the economic case for traditional power generators such as gas. Although the Department has not fully reappraised the government's strategic case, its analysis still shows that new nuclear power should play a role in the UK achieving its 2050 decarbonisation target at least cost. This aligns with the views of most independent energy sector analysts (paragraphs 1.9 to 1.12).

## The approach to the HPC deal

**8 The Department aligned its approach to the HPC deal with its support for other low-carbon technologies.** The 2010 Coalition Government agreement stated there would be no subsidy for nuclear power. This led the Department to negotiate a deal for HPC replicating as far as possible its contracts to support other low-carbon technologies, such as wind and solar. These contracts mean the private sector financing construction and taking all the risk during this phase of the project, in return for a guaranteed price for the electricity generated once completed. This is the first time such a financing approach has been used for nuclear power anywhere in the world (paragraphs 1.13 to 1.15).

**9 The Department did not assess the potential value-for-money implications for bill-payers of using alternative financing models.** Alternative financing models would have exposed consumers and/or taxpayers to the risks of the project running over budget and increased the risk of the project needing to be on the government's balance sheet. But our analysis suggests alternative approaches could have reduced the total project cost. The Department did not assess whether the reduced cost balanced against the increased exposure to risk would have resulted in better value for money for electricity consumers (paragraphs 1.16 to 1.19).

**10 The government opted to negotiate bilaterally with EDF, rather than wait for competition between nuclear developers.** The government's preferred approach for supporting investment in new low-carbon technologies is to create competition between projects to minimise costs for consumers. Experience with renewables since 2014 shows that significantly lower strike prices can be achieved when contracts are auctioned competitively. But in 2012 EDF was the only nuclear developer ready to take forward a new nuclear project, and the Department's analysis suggested there would be overall costs to society in delaying new nuclear capacity (paragraphs 1.20 to 1.22).

**11 The Department put in place mechanisms to mitigate the risk that negotiating a deal bilaterally would not minimise the cost to consumers:**

- The Department commissioned advisers to validate NNBG's estimates of building, running and decommissioning costs. The Department found that its advisers on NNBG's cost estimates – LeighFisher – had a potential conflict of interest. Although LeighFisher notified the Department of this in its proposal for the work in July 2012, the Department's monitoring and management of the potential conflict was insufficient (paragraphs 1.24 to 1.27; Appendix Three).
- The Department recognised that the advisers' validation provides relatively limited assurance because of a lack of reliable benchmarks. It therefore negotiated a construction gain-share clause in the CfD. This means that consumers will share the benefits if NNBG's actual construction costs are less than forecast (paragraph 1.26).
- The Department made clear throughout the HPC negotiations that the finalisation of any deal was always subject to value-for-money assessment. The Department's four value-for-money tests captured the main economic impacts of HPC that it could reasonably quantify, and it refined its analysis during the negotiations as new evidence emerged (paragraphs 1.28 and 1.29).

The case for proceeding with the HPC deal

**12 When the Department finalised the deal in 2016, its value-for-money tests showed the economic case for HPC was marginal and subject to significant uncertainty.** According to the first test, the investors are projected to make a return of 9.04%, which is in line with comparator projects. Consumers stand to benefit through a gain-share mechanism if the return is higher than forecast. For the second test, the Department's modelling shows that scenarios involving some new nuclear power generating from the mid-2020s were marginally less expensive overall than most, but not all, alternative scenarios. For its third test, although the Department concludes the CfD strike price is competitive with alternative low-carbon options, this is partly a result of it having a longer duration than the standard CfD term, which spreads the cost. We discuss the fourth test below. Overall, the Department's economic case is marginal. Less favourable, but reasonable, assumptions about future fossil fuel prices, renewables costs and follow-on nuclear projects would have meant the deal was not value for money according to the Department's tests (paragraphs 2.2 to 2.15).

**13 The Department has not sufficiently considered the costs and risks of its deal for consumers.** In testing the deal's affordability, the Department developed two related tests:

- First, the Department compared forecast CfD top-up payments for HPC with the amount it had allocated to pay for supporting nuclear power under its Levy Control Framework (the Framework). The Department uses the Framework to control the cost of its policies that pass costs onto bills. By September 2016 falling wholesale prices had reduced expected bills overall, but meant that forecast top-up payments for HPC had increased to being clearly above the amount the Department had previously set aside in the Framework. However, the Department did not conclude whether this meant that the deal was now unaffordable for consumers.
- Second, the Department compared the impact on household electricity bills up to 2030 of scenarios where HPC is built with scenarios where it is not. The Department estimates that around £10–£15 from the average bill will go towards supporting HPC in 2030. It calculates that annual bills during this time would be on average more than £20 higher if HPC is delayed and replaced with low-carbon alternatives. But this analysis does not take account of the fact that consumers are locked into paying for HPC, even if other technologies have become better value, long after 2030. The Department expects, for example, that offshore wind costs will be lower than the CfD strike price less than halfway through its 35-year term (paragraphs 2.16 to 2.20).

**14 The Department’s overall case for HPC has weakened since it agreed key commercial terms on the deal in 2013.** The expected future costs of most low-carbon alternatives to nuclear power have fallen more than expected. Delays have pushed back HPC’s expected construction schedule, reducing the case for paying a premium for it to be built before other nuclear power projects were able to compete for government support. There are now two other nuclear power developers with plans to complete projects around the same time as HPC, although this is subject to significant uncertainty given the inherent challenges of new nuclear projects. Significant reductions in expected fossil fuel prices mean that the present value of the expected cost of top-up payments under the HPC CfD increased from £6 billion to £30 billion (paragraphs 2.21 to 2.26).

**15 The Department’s capacity to take alternative approaches to the deal was limited after it agreed terms with EDF in 2013.** As the Department’s case for HPC weakened, there may have been upsides if it could have negotiated a better deal. But there were several potential downsides if the Department had deviated from the deal, particularly once terms had been agreed. This would have damaged investors’ confidence about engaging with the government on other large projects. The Department also considered it extremely unlikely that terms could be renegotiated in its favour as HPC’s investors’ expected return on the project fell, with EDF facing internal opposition to the existing deal’s terms. The Department was concerned that nuclear deployment had already been delayed for more than a decade and further delays could create risks for energy security in the late 2020s. These considerations meant the Department was less able to consider altering the deal or pursuing alternatives even if they would have resulted in better value for consumers (paragraphs 2.34 and 2.35).

**16 Other parts of government reviewed the deal but did not sufficiently consider its costs and risks for consumers:**

- HM Treasury reviewed the deal during negotiations and emphasised different considerations at various times. In 2013, it considered the deal’s potential value for money and noted that it appeared expensive, particularly compared with gas-fired power stations. In its September 2015 review, HM Treasury primarily considered the risk that the deal could mean HPC coming onto government’s balance sheet. 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.
- The Major Projects Authority (MPA) and the Major Projects Review Group (MPRG) also reviewed the deal. The MPA took assurance from the Department’s value-for-money tests that it was worth proceeding with the deal. Its recommendations, along with those of the MPRG, mainly focused on whether the Department had the resources to bring the negotiations to a conclusion and then manage the remaining risks (paragraph 2.31 to 2.33; Figure 11).



**17 The government has increasingly emphasised HPC’s unquantified strategic benefits, but it has little control over these and no plan yet in place to realise them.**

In continuing to conclude in favour of proceeding with HPC as the value-for-money case weakened, the government put more weight on the wider, unquantified strategic benefits of proceeding with the deal. These include the ‘option value’ of having new nuclear power in the generating mix, which could be more achievable if the HPC deal stimulates a pipeline of nuclear investments. But the recent financial difficulties of Toshiba, the main investor in the Moorside project, illustrate the uncertainties surrounding follow-on nuclear projects, regardless of the outcome of HPC. The Department also expects HPC to develop the UK nuclear supply chain, although competition rules preclude the Department from obligating EDF to contract with UK companies for a proportion of the project’s contracts. Despite the importance of these strategic benefits, the Department does not have a benefit realisation plan in place, although it is developing one (paragraphs 2.28 to 2.30).

Risks to be managed during construction

**18 The reactor design for HPC is unproven and other projects that incorporate it are experiencing difficulties.**

There are no examples of HPC’s reactor technology (the European Pressurised Water Reactor, EPR) working anywhere in the world. Other projects to build nuclear power stations using EPR technology in France, Finland and China have been beset by delays and cost overruns (paragraphs 3.3, 3.4 and Appendix Five).

**19 EDF’s financial position has weakened since 2013.** EDF has posted persistent negative cash flows with higher levels of capital expenditure than expected and earnings below financial analysts’ expectations, which has reduced its credit rating in recent years. It recently announced a detailed strategy to address this, which included a capital injection by the French State. A further deterioration of EDF’s financial profile or costs escalating at HPC could raise questions about its ability to fund HPC’s construction (paragraph 3.7).

**20 These factors mean there is a risk that NNBG will seek further financial support from the government, notwithstanding the contractual terms of the deal.**

NNBG carries all the risk of the project being on time and to budget as it will not receive payments through the CfD until HPC is generating power. But there are recent examples of large-scale UK infrastructure projects where risks intended to be borne by the private sector have been passed back to consumers and taxpayers to enable the projects to continue. If the HPC project or developer runs into difficulties, the UK government could come under pressure to provide more support or take on additional risk, particularly given HPC’s potential importance for ensuring energy security. Providing more support could mean exposing taxpayers to more risk and increase the chances that HPC comes onto the government’s balance sheet (paragraphs 3.5 and 3.6).

**21 The Department plans to develop and maintain alternative ways of ensuring energy security to mitigate the risk of needing to provide additional support for HPC.**

Having alternative ways to ensure energy security would mean that the government is not reliant on electricity generated from HPC. This would put it in a stronger position if the investors were to seek to renegotiate the terms of the deal, although it could add to consumers' costs overall (paragraph 3.9).

**22 The government's oversight arrangements of HPC's construction will also be vital.** The Low Carbon Contracts Company (LCCC, a government company that the Department has created) has primary responsibility for overseeing the project as the counterparty to the CfD. HPC is a complex project and it will be challenging for LCCC to interpret the information NNBG provides. It needs to do this to ensure that consumers benefit from the construction gain-share mechanism, and to get early and accurate understanding of any significant delays or cost overruns. These risks may be greater later on during construction when there will be less time to deploy alternative ways of ensuring there is sufficient generating capacity (paragraphs 3.10 to 3.13).

#### Risks to be managed after construction

**23 The Department will only maximise consumers' value if it maintains effective oversight of the contractual arrangements over several decades.** Conditions of the CfD could result in adjustments to the strike price over the 35-year term of the contract. The equity-gain share mechanism could lead to the shareholders of NNBG making a lump-sum payment through the life of the project after construction (paragraphs 3.14 to 3.17).

**24 The Department has aimed to protect taxpayers from exposure to the waste and decommissioning liabilities of HPC, but it is impossible to protect them entirely.** All new nuclear deals will include a Funded Decommissioning Programme, whereby the developer sets aside funds to pay for handling waste and decommissioning. The Department and NNBG have agreed a cap to the price for dealing with waste but there is substantial uncertainty about what the actual costs will be. Taxpayers could be exposed if actual costs are higher than the cap, or if HPC closes before NNBG has built up a sufficient fund to cover costs. The Department has calculated that the probability of these events occurring is remote (paragraphs 3.18 to 3.22).

#### **Conclusion on value for money**

**25** It is a widely shared view that the UK needs some new nuclear power to ensure the lowest-cost route to decarbonisation. But the Department's deal for HPC has locked consumers into a risky and expensive project with uncertain strategic and economic benefits. While committing the developer to bearing the construction risks means taxpayers and consumers are protected from costs overrunning, consumers could end up paying more for HPC's electricity than if the government had shared these risks. Past experience shows that ultimately these risks could shift back to taxpayers or consumers. If the project runs into trouble, the government may need to fund alternatives to ensure secure supply, or come under pressure to renegotiate its deal. The Department did not sufficiently appraise alternative ways to structure the deal.

**26** It will not be known for decades whether HPC will be value for money. This will depend on whether the current contractual arrangements endure, along with external factors including fossil-fuel prices, the costs of alternative low-carbon generation, and developments in energy technology and the wider electricity system. However, over the time the Department negotiated the deal, the case for HPC weakened. The Department and other parts of government were concerned primarily with the strategic ramifications of not proceeding and the benefits of keeping the project off the government's balance sheet. They did not consider sufficiently the costs and risks of the deal for consumers. The Department has, however, negotiated a deal that means some terms can be adjusted in consumers' favour in the future. It must now ensure it has the right oversight arrangements in place to manage the contract in a way that maximises HPC's value for consumers and taxpayers.

## **Recommendations**

**27** In developing effective oversight and governance arrangements for the HPC project, the Department should draw on best practice from other areas of government and internationally, and in particular:

- **Ensure, as soon as possible, that it and LCCC have the information and skills required to manage the contracts.** This includes having detailed monitoring information against milestones to flag for any deviations from the planned timetable; establishing and safeguarding sufficient capability for LCCC to interpret and, if necessary, challenge NNBG's compliance with its contractual obligations; and having a clear process for identifying and escalating project issues to senior decision-makers.
- **Make clear who in government is accountable for the different aspects of oversight and governance.** This includes who holds ultimate responsibility to represent consumers' and taxpayers' interests during the project.
- **Establish review mechanisms to ensure oversight structures are effective across the lifetime of the project.** The oversight arrangements will need to evolve over time as the project progresses through construction and into the operating stage. There should be a plan in place at the outset for when and how these changes will take place.
- **Develop and implement a plan to track the realisation of the intended benefits from the HPC project.** This includes working with stakeholders to enable national and local benefits for the project. The Department should consider what levers it has to influence the realisation of intended benefits.

28 In pursuing its objectives for the electricity system, the Department should:

- **Ensure it periodically reconsiders its strategic case for supporting nuclear power.** Technological changes or wider economic and political factors could increase or reduce the strength of the government's strategic case for supporting nuclear power investments, requiring changes to its approach. Given the likely rate of change, reassessing the strategic case once each Parliament is likely to be sufficient.
- **Maintain and update a 'Plan B' for achieving its objectives in the event that HPC is delayed or cancelled.** This should set out clear trigger points under which the Department would activate it. The Department's Electricity Policy Board or its equivalent should own this plan. It should be revisited on an ongoing basis to reflect prevailing circumstances.

29 In subsequent deals for any major energy infrastructure project the Department should:

- **Ensure that the cost and timing implications of alternatives are clearly shown to decision-makers when developing its project approach.** Alternative approaches may be outside the normal course of wider policy. But decision-makers should be made aware of the implications of their chosen approach to ensure they are making an informed decision, in particular about the value-for-money implications.
- **Understand and communicate to decision-makers the risk that making commitments to investors can limit flexibility to react to a change in circumstances.** Private investors need signals from government that it is committed to agreeing a deal so they have confidence to engage in negotiations and fund early development costs. But the HPC deal shows that as negotiations progress, particularly through milestones such as agreeing the terms of the deal, the government's flexibility to change course reduces. The implications of this need to be understood and clearly communicated to decision-makers, with the downsides of reduced flexibility being weighed up against the benefits of moving ahead with the deal.
- **Ensure that there is an effective and transparent mechanism for reviewing the value for money and affordability of the deal for consumers.** Any such mechanism should aim to safeguard against the risk that the cost impacts of infrastructure paid for through bills, rather than by taxpayers, receives less government attention. This could be achieved by, for example, producing an impact assessment when support is awarded without competition, or requiring Ofgem, the government's energy market regulator, to publish its assessment of the possible impacts of government decisions on consumers. These were both recent recommendations by the Competition and Markets Authority.