

<b>Title:</b> Revenue stream for the Nuclear RAB model <b>IA No:</b> BEIS077(F)-22-ESNM <b>RPC Reference No:</b> N/A <b>Lead department or agency:</b> Department for Business, Energy and Industrial Strategy (BEIS)	<b>Impact Assessment (IA)</b>			
	<b>Date:</b> 14/12/2022			
	<b>Stage:</b> Final			
	<b>Source of intervention:</b> Domestic			
	<b>Type of measure:</b> Secondary legislation			
<b>Contact for enquiries:</b> <a href="mailto:rabrevenueconsultation@beis.gov.uk">rabrevenueconsultation@beis.gov.uk</a>				
<b>Summary: Intervention and Options</b>				<b>RPC Opinion:</b> Not Applicable

**Cost of Preferred (or more likely) Option (in 2021 prices)**

Total Net Present Social Value	Business Net Present Value	Net cost to business per year	Business Impact Target Status
N/A	N/A	N/A	Not a regulatory provision

**What is the problem under consideration? Why is government action or intervention necessary?**

The Nuclear Energy ('Financing') Act makes provision for the implementation of a Regulated Asset Base (RAB) model for nuclear projects. The primary legislation put in place the structure to resolve the financial market constraints facing new nuclear, and secondary legislation is required to support effective deployment of the RAB model. Government intervention is needed to create an effective revenue stream mechanism that allows payments to flow and the RAB to operate, whilst ensuring all parties involved do not face undue costs.

**What are the policy objectives of the action or intervention and the intended effects?**

The overall objective of this legislation is to support the UK to achieve Net Zero by 2050. The direct policy objective is to implement the revenue regulations, within this Parliament, to support new nuclear projects financed by the RAB model. In particular, the aims are to establish a revenue stream mechanism that functions efficiently but does not unduly burden electricity suppliers and ultimately consumers; a proven and reliable revenue collection counterparty to facilitate the transfer of payments between suppliers and a relevant licensee nuclear company; and information sharing provisions to effectively implement the revenue stream.

**What policy options have been considered, including any alternatives to regulation? Please justify preferred option (further details in Evidence Base)**

Three policy options have been considered. (1) Do-minimum – includes minimum adjustments to the Contracts for Difference (Electricity Supplier Obligations) Regulations 2014 (CFD ESO Regulations) and minimum additional actions required for functioning nuclear RAB revenue regulations. (2) "Improved" RAB-adjusted Supplier Obligation (preferred option) – this option goes further and improves on some elements copied from the CFD ESO Regulations. (3) "Going further" RAB-adjusted Supplier Obligation – this option represents further changes in addition to those in option 2. No viable non-legislative options have been identified. The structures required to move money from suppliers to a nuclear company are highly unlikely to happen without regulations in place.

<b>Will the policy be reviewed?</b> It will be reviewed. <b>If applicable, set review date:</b> 12/2025				
Is this measure likely to impact on international trade and investment?		No		
Are any of these organisations in scope?	<b>Micro</b> Yes	<b>Small</b> Yes	<b>Medium</b> Yes	<b>Large</b> Yes
What is the CO <sub>2</sub> equivalent change in greenhouse gas emissions? (Million tonnes CO <sub>2</sub> equivalent)	<b>Traded:</b> N/A		<b>Non-traded:</b> N/A	

***I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.***

Signed by the responsible Minister:  Date: 14th December 2022

# Summary: Analysis & Evidence

# Policy Option 2

**Description:** "Improved" RAB-adjusted Supplier Obligation

## FULL ECONOMIC ASSESSMENT

Price Base Year 2022	PV Base Year 2022	Time Period Years 1	Net Benefit (Present Value (PV)) (£m)		
			Low: -£0.10	High: -£0.01	Best Estimate: -£0.05

COSTS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant	Total Cost (Present Value)
Low	£0.01	N/A	£0.01
High	£0.10	N/A	£0.10
Best Estimate	£0.05	N/A	£0.05

### Description and scale of key monetised costs by 'main affected groups'

There will be familiarisation costs associated with this policy, related to reading and understanding the new regulatory requirements and guidance. Low and high estimates range from approximately £10,000 to £103,000, with £51,000 as the best estimate. This cost relates to a one-year time period. There will be additional costs related to the revenue channel if a nuclear project is designated with a RAB model and enters into a revenue collection contract. These include administration costs, as well as collateral and reserve fund opportunity costs. These costs cover a longer time period.

### Other key non-monetised costs by 'main affected groups'

There are no other non-monetised costs associated with this legislation by itself. There will be additional non-monetised costs if a nuclear project is designated with a RAB model and enters into a revenue collection contract. These include supplier administration costs, costs to Ofgem of information sharing and calculating the RAB payment, costs to suppliers of uncertainty in payment amounts, and revenue stream risks to the nuclear company if the revenue collection counterparty is unable to carry out its duties.

BENEFITS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant	Total Benefit (Present Value)
Low	N/A	N/A	N/A
High	N/A	N/A	N/A
Best Estimate	N/A	N/A	N/A

### Description and scale of key monetised benefits by 'main affected groups'

The estimated benefit associated with this legislation, by itself, is zero. Benefits will be unlocked if a nuclear project is designated with a RAB model and enters into a revenue collection contract. The benefits that may be unlocked, associated with the reduction in cost of building and financing a new nuclear power plant through a RAB model rather than a CFD could be of the magnitude of £30bn - £80bn (estimated in the Regulated Asset Base model for new nuclear Impact Assessment, see footnote three).

### Other key non-monetised benefits by 'main affected groups'

No other non-monetised benefits have been identified.

<b>Key assumptions/sensitivities/risks</b>	<b>Discount rate</b>	3.5%
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The key assumptions of this Impact Assessment are the hurdle rate (the minimum return needed to incentivise investment), construction cost, and construction duration. Sensitivity analysis has been carried out on all three of these assumptions. The main risk is associated with the uncertainty of the number of nuclear power plants that will be built in GB using the RAB model, as the magnitude of opportunity cost impacts will depend on this.

## BUSINESS ASSESSMENT (Option 2)

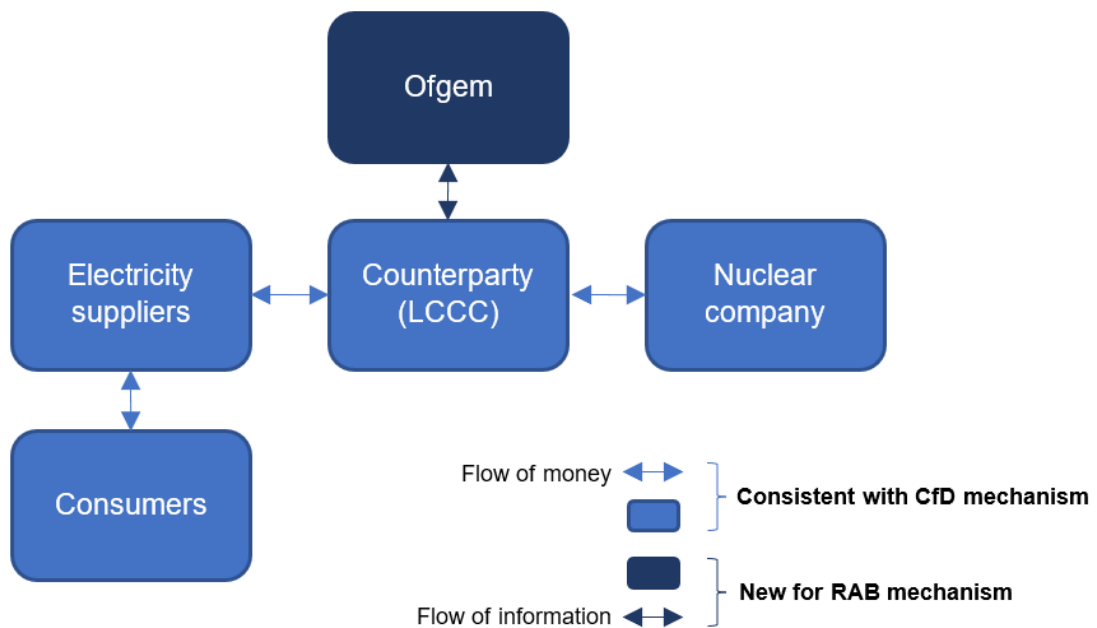
<b>Direct impact on business (Equivalent Annual) £m:</b>			<b>Score for Business Impact Target (qualifying provisions only) £m: N/A</b>
<b>Costs:</b> N/A	<b>Benefits:</b> N/A	<b>Net:</b> N/A	

# Evidence Base

## 1. Background

1. The Nuclear Energy (Financing) Act<sup>1</sup> ('the Act') received Royal Assent on the 31 March 2022 and makes provision for the implementation of a Regulated Asset Base (RAB) Model for nuclear projects. The RAB model can be used to finance infrastructure and enables investors to share the construction and operating risks with consumers and taxpayers.
2. One objective of the Act was to provide the Secretary of State with powers to create a revenue stream mechanism for nuclear RAB projects. For a RAB-designated nuclear project<sup>2</sup>, the relevant licensee nuclear company is allowed to receive a regulated revenue from electricity suppliers while the RAB licence conditions are in place, i.e. throughout the RAB regulatory period. The amount the nuclear company is allowed to receive in return for financing and implementing the nuclear project will be determined by Ofgem under the terms of the RAB licence.
3. The Secretary of State has designated the Low Carbon Contracts Company (LCCC) as the revenue collection counterparty to channel funds between electricity suppliers and the nuclear company. This counterparty would (upon direction by the Secretary of State) enter a revenue collection contract with the 'relevant licensee nuclear company' (as defined in the Act). Ofgem will calculate and confirm the payments the revenue collection counterparty will need to make to, or receive from, the relevant licensee nuclear company. The revenue collection counterparty will charge levies to electricity suppliers to make these payments, in line with the amount of electricity they supply to their customers. Electricity suppliers are likely to pass on the costs to consumers. The proposed process is outlined below in Figure 1.

Figure 1: Flow of revenue and information between the relevant parties



<sup>1</sup> Nuclear Energy (Financing) Act 2022, available: <https://bills.parliament.uk/bills/3057/publications>

<sup>2</sup> Nuclear regulated asset base (RAB) model: statement on procedure and criteria for designation (2022), available: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/1068133/nuclear-rab-model-statement-procedure-criteria-designation.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1068133/nuclear-rab-model-statement-procedure-criteria-designation.pdf)

## 2. Problem under consideration and rationale for intervention

4. Section 1.1 of the impact assessment for the RAB model<sup>3</sup> considered the financial market constraints facing new nuclear. This highlighted significant financial challenges and risks when raising the large amounts of funds required for complex infrastructure projects. Whilst the primary legislation puts in place the structure required to resolve this market failure, secondary legislation is required to support effective deployment of the RAB model.
5. Government intervention is needed to create an effective revenue stream mechanism that allows payments to flow and the RAB to operate, whilst ensuring that all parties involved (including electricity suppliers, consumers, nuclear companies, regulators and the wider market) do not face undue costs. There are risks to these groups if the process is designed inefficiently, including unnecessary costs being placed on suppliers which are likely to be passed onto consumers.

## 3. Description of options considered

### 3.1. Revenue Regulations

6. The proposed approach to revenue regulations for the nuclear RAB revenue stream primarily uses precedents established by The Contracts for Difference (Electricity Supplier Obligations) Regulations introduced in 2014<sup>4</sup> ('CFD ESO Regulations'). These regulations provided the starting point for each of the options discussed here since they relate to the imposition of a levy on electricity suppliers to pay amounts due under a contract for difference (CFD). The proposed revenue regulations include:
  - a. **The revenue collection counterparty:** There is a requirement to have a revenue collection counterparty to ensure efficient and effective running of the revenue stream from suppliers to the relevant licensee nuclear company. The Low Carbon Contracts Company Ltd (LCCC) will perform this role for the RAB as they currently do in their role as 'CFD counterparty' under the CFD scheme.
  - b. **Interim levy rate:** The revenue collection counterparty will set an interim levy rate to charge suppliers over a quarterly levy period since there will be uncertainty about suppliers' share of electricity supply in any forthcoming quarter and payments will depend on the amount of electricity supplied.
  - c. **Reserve amounts:** Suppliers are required to make reserve payments at the start of each quarterly levy period. This requires the revenue collection counterparty to calculate what it needs to collect from suppliers to ensure that it has a 95% probability of meeting its RAB payment obligations to the nuclear company. This will protect the revenue collection counterparty against any supplier shortfalls.
  - d. **Reconciliation payments:** At the end of each quarterly levy period, the revenue collection counterparty will reconcile payments received from suppliers against those required to the nuclear company. Money will be returned to suppliers if they have been overcharged, or invoices will be sent for further amount owed if they have been undercharged.
  - e. **Operational cost levy:** The revenue collection counterparty will receive payments for the administration of their responsibilities as the revenue collection counterparty. This is in the form of the operational cost levy which is imposed on electricity suppliers.
7. There are differences with the nuclear RAB payment mechanics and the CFD ESO Regulations. Most notably under a RAB, Ofgem will, as the economic regulator, calculate the allowed revenue in accordance with the terms of the RAB licence. Suppliers will also be charged during the construction phase of a nuclear project under a RAB (as well as the operation phase).

### 3.2. Policy Options

8. We consider three policy options:

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<sup>3</sup> Regulated Asset Base model for new nuclear (2021), available: <https://publications.parliament.uk/pa/bills/cbill/58-02/0174/ImpactAssessment.pdf>

<sup>4</sup> The Contracts for Difference (Electricity Supplier Obligations) Regulations (2014), available: <https://www.legislation.gov.uk/uksi/2014/2014/contents/made>

- a. **Policy Option 1: “Minimum” required RAB-adjusted Supplier Obligation (Do-minimum option).** This option represents the do-minimum action and is predicated on two criteria: i) minimum adjustments to the CFD ESO Regulations; and ii) minimum additional actions required for functioning nuclear RAB revenue regulations. We believe a do-minimum is the correct base to compare against since a do-nothing counterfactual would not represent a viable RAB mechanism, the objective of the primary legislation.
  - b. **Policy Option 2 (the preferred option): “Improved” RAB-adjusted Supplier Obligation.** This option improves on some elements copied from the CFD ESO Regulations. Specifically, it includes:
    - i. Amendments to the notice periods of forthcoming quarterly interim levy rates and the reserve amounts to allow Ofgem to forecast a more accurate RAB payment amount to the revenue collection counterparty.
    - ii. Setting out certain matters that must be covered by the terms contained in the draft revenue collection contract between the revenue collection counterparty and the relevant licensee nuclear company. This is preferred to no terms within the do-minimum option to ensure all the necessary provisions are contained in the revenue collection contract pursuant to enabling a functioning revenue stream.
    - iii. A requirement for the revenue collection counterparty to promptly notify the Secretary of State if it is unable to carry out its duty. This is in addition to the formal three-month notice period in the previous policy option and would provide more time to find a replacement entity.
  - c. **Policy Option 3: “Going further” RAB-adjusted Supplier Obligation.** This option represents further changes in addition to those in option 2. It includes:
    - i. Revenue regulations setting out more detailed mechanics about how information is shared between certain persons, for example the timing of when information is shared. This is not our preferred option since each designated project will have bespoke information sharing requirements, so it would be inappropriate to over specify in the regulations.
    - ii. Revenue regulations giving the revenue collection counterparty the ability to carry out its own indicative calculation of the RAB payment to enable them to project suppliers’ payment liabilities in upcoming quarterly periods. This is also not currently preferred since this could lead to confusion with multiple parties making their own calculations, potentially increasing the operational costs levy.
9. We believe the preferred option minimises impacts to society of inefficient regulations, caused by either under or over specification. Adjustments to the CFD ESO Regulations are specified to allow the RAB revenue channel to operate efficiently, but they are not overly burdensome. Annex 1 details a breakdown of policy options.

### 3.3. Non-legislative options

10. We have not identified any viable non-legislative options and do not believe such an approach is possible. The structures required to move money from suppliers to a nuclear company are highly unlikely to happen without regulations in place. Additionally, the previous CFD Supplier Obligation regulations demonstrate the legislative option works.

## 4. Policy objective

11. The overall objective of this legislation, as in the Act, is to support the UK to achieve Net Zero by 2050. As set out in the British Energy Security Strategy<sup>5</sup>, the Government is pursuing significant acceleration in our nuclear capacity as an important source of reliable low-carbon electricity. A RAB funding model is required to attract private finance at a cost that represents value for money to consumers and taxpayers.

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<sup>5</sup> British energy security strategy (2022), available: <https://www.gov.uk/government/publications/british-energy-security-strategy>

12. The direct policy objective is to implement the revenue regulations within this Parliament to support new nuclear projects financed through a RAB model. The aims are to establish:
  - a. **A revenue stream mechanism that functions efficiently** but does not unduly burden electricity suppliers and ultimately consumers. The intention is that electricity suppliers will make payments to the revenue collection counterparty<sup>6</sup> as required, to pay the relevant licensee nuclear company a regulated allowed revenue (i.e. the RAB payments). The amount will be confirmed by Ofgem and should be no more or less than required.
  - b. **A proven and reliable revenue collection counterparty** to facilitate the transfer of payments between suppliers and a relevant licensee nuclear company.
  - c. **Information sharing provisions to effectively implement the revenue stream** - This must account for the information sharing and payment confirmation mechanics between Ofgem and the revenue collection counterparty to function efficiently.
13. See Annex 2 for the Theory of Change presenting the types of outputs, outcomes (short, medium, and long term) and impacts which result from implementation of a stable, clear, and consistent revenue stream mechanism.
14. The core short-term output is legislation which puts in place a mechanism for the revenue stream to allow the nuclear RAB model to function.

## 5. Summary and preferred option with description of implementation plan

15. The nuclear RAB revenue stream will be given effect through secondary legislation (i.e. revenue regulations), via the affirmative procedure. It is anticipated that these regulations will be laid before Parliament by mid December 2022 (subject to all relevant approvals). The revenue regulations will come into effect 21 days after the regulations are made by the Secretary of State.<sup>7</sup>
16. Under the revenue regulations the revenue collection counterparty would operate the payments. Once the contract is entered into the counterparty would collect from suppliers the specified revenue amounts that are owed to the nuclear company (as confirmed by Ofgem as Economic Regulator). The revenue collection counterparty could, where required, enforce against suppliers for non – payment. Ofgem would also have the ability to enforce against non-compliance under the revenue regulations.
17. LCCC has commenced work on the design and development of the RAB revenue settlement systems. Given that the nuclear RAB revenue stream has been modelled on the CFD revenue regime we assess the implementation risk for establishing new settlement systems as low.

## 6. Monetised and non-monetised costs and benefits of each option (including administrative burden)

### 6.1. Monetised impacts

18. The primary legislation impact assessment<sup>3</sup> estimated that the RAB model could reduce the present value cost of building and financing a new nuclear power plant by between £30bn and £80bn<sup>8</sup> in present value terms compared with a CFD.
19. Specific to this secondary legislation, we have considered a range of impacts concerning the policy options around the implementation and operation of the revenue channel mechanism on suppliers and other key bodies in the revenue chain.

#### 6.1.a. The revenue collection counterparty administration costs (operational levy costs)

20. There are costs to the revenue collection counterparty associated with their role in running the revenue stream mechanism which are consistent across all policy options. These will be similar to the costs incurred in administering the CFD scheme. They have been estimated by the LCCC (using

<sup>6</sup> The revenue collection counterparty will also need to recover from suppliers their operational/administrative costs in return for performing this role through the operational costs levy.

<sup>7</sup> The exact timing of when the regulations will be made will be dependent on Parliamentary passage/timing.

<sup>8</sup> 2021 prices, discounted to a 2021 base year - Page 14 - <https://publications.parliament.uk/pa/bills/cbill/58-02/0174/ImpactAssessment.pdf>

their actual costs associated with CFDs and capacity markets) and are detailed in Table 1 below. Costs include:

- a. **Payroll costs:** Covering support functions and related full-time equivalent across the relevant teams associated with the RAB. This drops after the first year because of reduced costs related to set-up.
- b. **EMR Settlement Ltd (EMRS)<sup>9</sup> costs:** Ongoing operational costs related to the operator resource required to undertake manual checks on settlement as well as handle supplier queries. EMRS is assumed to start performing their settlement services in FY23/24.
- c. **Professional and legal costs:** Covering fees related to audit fees and legal employment costs.
- d. **Premises costs:** Covering costs included with the location (council tax, rent, and/or services). The increases are mainly because of inflation and larger desk requirements.
- e. **Contractor costs:** Covering any contractor costs where support may be required during the peak time.
- f. **Depreciation:** Covering any depreciation costs associated with hardware (including the RAB settlement system).
- g. **Other costs:** Covering recruitment, insurance, training, stationery, and other miscellaneous costs. The increases over the next two years are driven by insurance costs due to uncertainty over a new scheme.
- h. **MWh contingency:** As the operational costs are charged through a levy (based on forecast demand), a 5% addition is added to mitigate the risk the revenue collection counterparty does not receive enough to cover costs due to periods of low electricity supply.

*Table 1 – LCCC’s estimated RAB operational costs between 2022/23 and 2024/25 (£k in nominal terms, rounded to 2 significant figures)*

Description	FY22-23	FY23-24	FY24-25
Payroll costs	400	340	370
EMRS costs	3	110	110
Professional and Legal fees	33	27	26
IT costs	21	22	24
Premises costs	14	15	18
Contractor costs	5	4	4
Depreciation	4	76	75
Other costs	55	59	74
Total	540	650	700
MWh contingency (5%)	27	32	35
<b>Total*</b>	<b>560</b>	<b>680</b>	<b>740</b>
Operational levy charge (£/MWh)	0.0020	0.0025	0.0028

\*Note that the total may not appear to sum correctly due to rounding.

<sup>9</sup> EMRS is envisaged to be subcontracted by the revenue collection counterparty to perform their role as RAB settlement services provider.

21. Most of these costs should affect all policy options equally as all require the revenue collection counterparty to function. For policy option 3, there could be slightly increased employee costs resulting from the revenue collection counterparty projecting the future supplier charges.

### 6.1.b. Reserve fund opportunity cost

22. For each quarterly levy period, the revenue collection counterparty will collect funds from electricity suppliers to ensure it has a 95% probability of being able to meet its RAB payment obligations. These funds are held by the revenue collection counterparty (in a zero-interest account<sup>10</sup>) until after the reconciliation has been completed.
23. We expect that any uncertainty around the difference payment<sup>11</sup> is likely to be greater during the operational phase of the nuclear power plant (due to fluctuations in the wholesale price) rather than during construction (where near-term costs are likely to be more predictable). However, the magnitude of difference payments will likely be largest in the construction period, given the plant is not operating and generating wholesale market revenue. There is also the opportunity for payment from the nuclear company to electricity suppliers (through the revenue collection counterparty) during operation if wholesale market revenue exceeds the allowed revenue<sup>12</sup> amount.
24. Associated with this reserve fund amount is an opportunity cost (the value of the best alternative foregone by having to provide reserve funds to the revenue collection counterparty) to the electricity suppliers since they could have invested the funds instead.
25. To estimate the value of this opportunity cost, an illustrative allowed revenue stream has been calculated for the construction period of an illustrative large-scale nuclear power plant. The analysis focuses on the construction period given the difference payments will likely be largest during this time. Furthermore, allowed revenue during the operational phase will depend on project specific negotiated RAB contracts.
26. The allowed revenue calculation is based on a range of hurdle rates observed in similar markets where returns are regulated. The calculation takes account of the point in time that the costs are incurred, but assumes the cost of finance is recovered each year. The modelling assumptions are consistent with the Act, see Annex 3 for further details.
27. The opportunity cost is assumed to be the risk-free rate. This is the theoretical rate of return required on an investment that has zero risk. There is no investment that carries zero risk, so this is typically proxied by Government bonds (gilts)<sup>13</sup>. The reserve fund amount could have instead been invested in gilts which are assumed to be free of the risk of default by the issuer – the UK Government.
28. To estimate recent gilt rates, we have assessed the average return associated with medium maturity (10 year) gilts over the last decade. This returns a figure of approximately 1%, when rounded to 1 significant figure. This is quite a low return, associated with low interest rates and inflation over the period, however since July the monthly average gilt yield has increased from around 2% to 4%. Given this recent upwards trend, we have tested a range of gilt rates as the opportunity cost, with the lower bound as 1%. The upper bound is associated with pre-financial crisis rates (a period of higher interest rates and inflation) which provides an estimate of 5%, rounded to 1 significant figure.
29. The estimated impact of the reserve fund opportunity cost is detailed below. These costs should affect all policy options equally.

*Table 2 – Illustrative reserve fund opportunity cost (maximum cost in any one year of the construction period, £m, rounded to 1 decimal place)*

(2021 <sup>14</sup> prices, undiscounted <sup>15</sup> )	Nth of a kind, Europe, optimism bias assumptions	Post 1990 optimism bias assumptions
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<sup>10</sup> Funds are held in a non-interest-bearing account as the LCCC is a government owned entity and does not make a profit.

<sup>11</sup> A source of revenue for the nuclear company, met by electricity suppliers.

<sup>12</sup> Set by Ofgem, funded through wholesale market revenue and difference payments met by electricity suppliers.

<sup>13</sup> Gilt yields are sourced from the Debt Management Office.

<sup>14</sup> The reserve fund opportunity cost is quoted in 2021 prices to be consistent with the Act.

<sup>15</sup> The first year of discounting is determined by the policy intervention year, which would depend on when a nuclear project is designated with a RAB. Given the RAB could apply to a number of different nuclear projects, each with a different designation date, the reserve fund opportunity cost impacts are undiscounted.



Maximum cost in any one year (4% hurdle rate)	£0.3m - £1.3m	£0.4m - £2.2m
Maximum cost in any one year (5% hurdle rate)	£0.3m - £1.6m	£0.5m - £2.7m
Maximum cost in any one year (6% hurdle rate)	£0.4m - £2.0m	£0.6m - £3.2m

### 6.1.c. Cost of raising collateral

30. There is a requirement for electricity suppliers to provide collateral to the revenue collection counterparty to cover the risk of them defaulting on their payment obligations. As with the CFD ESO Regulations, the amount of collateral required is 21 days of interim payments. These are held by the revenue collection counterparty.
31. As with the reserve funds, there is an opportunity cost associated since the money could accrue interest elsewhere.
32. Estimating the collateral opportunity cost follows the same methodology as the reserve fund opportunity cost, see paragraphs 24 - 27.
33. The estimated impact of the collateral opportunity cost is detailed below. These costs should affect all policy options equally.

*Table 3 – Illustrative collateral opportunity cost (maximum cost in any one year of the construction period, £m, rounded to 1 decimal place)*

(2021 <sup>16</sup> prices, undiscounted <sup>17</sup> )	Nth of a kind, Europe, optimism bias assumptions	Post 1990 optimism bias assumptions
Maximum cost in any one year (4% hurdle rate)	£0.6m - £3.0m	£0.9m - £5.9m
Maximum cost in any one year (5% hurdle rate)	£0.8m - £3.8m	£1.2m - £6.2m
Maximum cost in any one year (6% hurdle rate)	£0.9m - £4.5m	£1.5m - £7.5m

### 6.1.d. Familiarisation costs

34. There will be familiarisation costs associated with this policy, related to reading and understanding the new regulatory requirements and guidance. Assuming a reading speed of 200 words per minute, 500 words per page, and the regulations being 50 pages long, it would take 125 minutes to read the RAB revenue channel requirements. We have limited evidence to inform the estimate of time taken to read and understand the regulations and are therefore allowing one week for this<sup>18</sup>. We consider this a conservative assumption. We also assume one legal professional and one manager review the regulations. Wage estimates from ONS's annual survey of hours and earnings suggest a legal professional and manager earn a median weekly wage of £824.1 and £891.1<sup>19</sup> respectively (compared to the all employee median weekly pay of £620.6). Non-wage costs are accounted for

<sup>16</sup> The collateral opportunity cost is quoted in 2021 prices to be consistent with the Act.

<sup>17</sup> The first year of discounting is determined by the policy intervention year, which would depend on when a nuclear project is designated with a RAB. Given the RAB could apply to a number of different nuclear projects, each with a different designation date, the collateral opportunity cost impacts are undiscounted.

<sup>18</sup> One stakeholder provided an indicative estimate of a minimum of three days to familiarise with the legislation, but any detailed legal questions or analysis would require more time. We have assumed one week as a conservative assumption given this is only one point of evidence and there could be variation between different parties required to review the regulations. Further review of regulation may also occur when a nuclear project is designated with a RAB model and the revenue channel is in use.

<sup>19</sup> ASHE 2022 provisional:

<https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/datasets/occupation4digitsoc2010ashtable14>

with a 24.6% uplift<sup>20</sup>. This estimates a total weekly wage cost of £2,137<sup>21</sup>. Currently 24 parties<sup>22</sup> would be required to familiarise themselves with the regulations, so we expect this cost to be approximately £51,000. Sensitivity analysis has been completed in the table below:

Table 4 – Familiarisation cost estimates (£, rounded to the nearest 1000)

Time taken to read and understand regulations	Total familiarisation cost (2022 <sup>23</sup> prices, discounted to a 2022 base year)
1 day	£10,000
5 days (central assumption)	£51,000
10 days	£103,000

## 6.2. Non-monetised impacts

### 6.2.a. Supplier administration costs (consistent across all policy options)

35. As with the revenue collection counterparty administration costs, there are likely to be administrative costs to electricity suppliers. In response to the consultation, suppliers provided comments on the nature of costs they would likely incur, including costs related to internal forecasting of non-commodity costs (NCCs), commercial considerations on how to pass NCCs through to customer pricing, dealing with the daily receipt of invoices and ensuring collateral is available. We expect these costs to be relatively small given the similarities of the RAB revenue mechanism to the CFD supplier obligation mechanism. We do not have sufficient evidence on the magnitude of these costs to model them.

### 6.2.b. Costs to Ofgem of information sharing and calculating the RAB payment to the revenue collection counterparty

36. There are likely to be some costs to Ofgem associated with information sharing and calculating the amount of RAB funding required to the revenue collection counterparty. The associated costs are likely to vary depending on the level of detail specified in the regulations.

37. We would expect higher costs under Policy Option 3 which has greater specificity in the regulations than the other two options. We do not have sufficient evidence on the magnitude of these costs to model them.

38. In response to the consultation, Ofgem recognised the need for including information sharing powers in the regulations, and their view is that these should be used appropriately and efficiently.

### 6.2.c. Costs to suppliers of uncertainty in payment amounts

39. Our policy options considered different notice periods. Longer notice periods provide more time for suppliers to adjust for forthcoming payments. Shorter notice periods could reduce the amount of reconciliation required due to increased accuracy in the forecasts from using more up-to-date data. This cost varies between policy options. The implications of different notice periods on costs are uncertain due to a lack of evidence. We are therefore unable to model this cost.

40. The reason for the 30-day notice period proposed under the revenue regulations is to allow for the sequence of processes that need to take place before the revenue collection counterparty gives suppliers notice. These include Ofgem calculating the RAB payment, confirming the RAB payment to the revenue collection counterparty, and the revenue collection counterparty calculating the interim levy rate and total reserve amount to apply over the quarterly period.

<sup>20</sup> Eurostat: [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Hourly\\_labour\\_costs#Hourly\\_labour\\_costs\\_ranged\\_between\\_.E2.82.AC7.0\\_and\\_.E2.82.AC46.9\\_in\\_2021](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Hourly_labour_costs#Hourly_labour_costs_ranged_between_.E2.82.AC7.0_and_.E2.82.AC46.9_in_2021)

<sup>21</sup> Human resource requirement costs are likely to be higher for Ofgem and the revenue collection counterparty (LCCC) than electricity suppliers due to their roles in the implementation of the revenue channel.

<sup>22</sup> 22 electricity suppliers (<https://www.ofgem.gov.uk/energy-data-and-research/data-portal/retail-market-indicators>), Ofgem, and the revenue collection counterparty (LCCC).

<sup>23</sup> The familiarisation cost is quoted in 2022 prices to be consistent with the most recent wage data.

41. In response to the consultation, electricity suppliers in the main were not in favour of the 30-day notice period proposed under nuclear RAB. They preferred a longer three month notice period akin to that of CFDs. Their main areas of contention were regarding the amount of time it would give them to price tariffs and arrange for credit cover.
42. To address this concern, the intention is that revenue regulations would make provisions for the revenue collection counterparty to estimate the liabilities of electricity suppliers arising during three consecutive quarterly obligation periods, replicating the CFD ESO regulations. Government believes this will mitigate issues around preparing for payments and future costs to incorporate into their tariffs.

#### **6.2.d. Revenue stream risks to the nuclear company if the revenue collection counterparty is unable to carry out its duties**

43. The preferred option is for the revenue collection counterparty to promptly inform the Secretary of State if they are unable to carry out their duties. If possible, the revenue collection counterparty should inform earlier than the formal three-month notice period in the Revenue Regulations. This will reduce risks of the nuclear company not receiving the regulated revenue, by giving more time to find a suitable and capable replacement to carry out the functions of the revenue collection counterparty. The implications of different notice periods on costs are uncertain because the implications of the revenue collection counterparty not being able to carry out its duties are unclear. Therefore, we are unable to model this cost.
44. The consultation responses largely agreed with the proposal for an additional layer of notification in the revenue regulations.

### **7. Direct costs and benefits to business**

45. Businesses will face costs from the RAB revenue channel implementation. As with the CFD revenue stream, suppliers will be invoiced daily RAB interim rate payments, daily operational cost payments and quarterly reserve payments. Suppliers can pass these costs onto their consumers who use the Electricity System.
46. Suppliers are also likely to face administration costs associated with the RAB revenue stream.

### **8. Risks and assumptions**

#### **8.1 Number of new nuclear power plants**

47. The illustrative modelling assessing the opportunity cost of the reserve fund and collateral is based on the potential impacts of one new large-scale nuclear power plant built using the RAB model. Consideration of multiple plants has not been examined in the modelling for this Impact Assessment because the number of new nuclear power plants is uncertain. However, this would be part of any assessment to introduce a RAB model for a specific new nuclear power plant.
48. If more than one new nuclear power plant is built in GB, the opportunity cost impacts would be greater than estimated in this Impact Assessment. If no new nuclear power plants are built in GB, the impacts of introducing the RAB and its associated revenue channel are expected to be negligible.

#### **8.2 Cost data**

49. Annex 3 details the assumptions used to calculate the reserve fund and collateral opportunity cost in section 6.1. Cost assumptions are calculated using data from the Hinkley Point C project and an Electricity Generation Costs report prepared by LeighFisher.<sup>24</sup>
50. The Electricity Generation Costs report prepared by LeighFisher was published in 2016, and therefore will not reflect recent technological and market changes. To address this, Frazer-Nash Consultancy has been awarded a contract by the Department to update nuclear energy generating

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<sup>24</sup> See page 134 of Electricity Generation Costs report.

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/566803/Leigh\\_Fisher\\_Nonrenewable\\_Generation\\_Cost.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/566803/Leigh_Fisher_Nonrenewable_Generation_Cost.pdf)

costs for large and advanced nuclear technologies. However, the report is expected to be published in 2023 so new cost assumptions are not currently available.

51. Hinkley Point C may not be representative of all future nuclear power plants built in GB. Future plants may be of different designs to Hinkley Point C and would be built in different locations. The modelling for this Impact Assessment assumes a range in construction costs to take account of some of the uncertainty around what designs of nuclear power plants will come forward in future and what their costs will be.

### 8.3 Sensitivity Analysis

52. In addition, sensitivity analysis has been undertaken on the construction schedule assumption, as this was similarly calculated using data from the Hinkley Point C project. Sensitivity analysis has also been carried out on the cost of finance assumption, to illustrate uncertainty in the hurdle rate for a new nuclear power plant. See tables 2 and 3.

## 9. Impact on small and micro businesses

53. There are currently 11 large/medium energy suppliers in the domestic retail energy market<sup>25</sup>, with 1.6% of market share also accounted for by small suppliers. The impact of this legislation on businesses will vary depending on the market share of an electricity supplier: the greater the market share, the more the electricity supplier will be charged by the revenue collection counterparty. While small and microbusinesses may be disproportionately affected by administrative costs, we expect these to be minimal given the similarities to CFD payments.

## 10. Wider impacts

54. In the Nuclear Energy (Financing) Act impact assessment<sup>4</sup>, we identified age, disability and race, and pregnant/maternity leave groups as those most vulnerable to disproportionate energy bill impacts. Since the impacts specifically related to the set-up and running of the revenue stream may be passed onto consumers, we believe the same three groups will be vulnerable for similar reasons.
- Age** – Those who are older may be less likely to benefit from future energy bill reductions from the low-carbon electricity produced from a nuclear plant. Therefore, increases to bills through potential costs imposed by suppliers to account for uncertainty or volatility in the RAB payment amount, particularly during the construction period, might not be rewarded with lower future bills.
  - Disability and Race** – Disability Groups and Ethnic Minorities are disproportionately represented in lower income households. Lower-income households are disproportionately affected by changes to electricity bills because any increase represents a larger share of their household income than those in middle- or higher-income households. Therefore, any increases imposed by suppliers to account for uncertainty or volatility in the RAB payment amount would disproportionately increase the bills of these groups.
  - Pregnant/Maternity Leave Groups** – Any increases in consumer electricity bills due to increases imposed by suppliers to account for uncertainty or volatility could particularly impact those on unpaid maternity leave, or unable to work due to pregnancy. Therefore, the revenue stream regulations could disproportionately increase the bills of these groups.
55. We do not expect any disproportionate impacts from this legislation on the following protected characteristic groups: Marriage/Civil Partnership, Religion or Belief, Sex, Gender Reassignment or Sexual Orientation.
56. The bill impacts associated with the monetised costs in this Impact Assessment (related to the implementation of the RAB revenue stream mechanism) are expected to be negligible. As such, we do not expect there to be a large impact on vulnerable consumers. However, this policy does allow

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<sup>25</sup> <https://www.ofgem.gov.uk/energy-data-and-research/data-portal/retail-market-indicators> - Correct as at end of October 2022 – note that the retail energy market structure is changing at pace so the number may be different closer to time of publication.

for costs to be passed on to vulnerable consumers, potentially affecting 13% of households (the percentage of households living in fuel poverty in England<sup>26</sup>).

57. On balance, we consider that the marginally disproportionate negative impact to the identified groups would be outweighed by the benefits nuclear RAB would provide (e.g. lower overall cost nuclear projects, energy security and meeting climate change targets).

## 11. A summary of the potential trade implications of measure

58. The impacts from these measures are not considered to impact international trade and investment.

## 12. Monitoring and Evaluation

59. The revenue channel represents one of three parts stipulated in legislation for the RAB (including the Act and legislation on Special Administration Regimes) and is difficult to extricate entirely to allow a thorough examination. Therefore, this monitoring and evaluation plan should be light-touch, with a more detailed plan instead being appropriate for assessing the RAB as a whole. A moderate focus on monitoring should be expected, with evaluations conducted periodically, early on (i.e. within the first 2-3 years) in the different project stages to ensure it is operating effectively
60. Several key pieces of information will need regular collection for monitoring. Regulation 9 stipulates the need for reserve amounts, collateral, and an interim levy rate to be paid based on units of electricity supplied. Each of these will need to be monitored to assess whether they are present and, if they are, the amount required. The units of electricity also need to be monitored to ensure the right payments for those units is calculated and then paid to suppliers, while suppliers themselves will also have to pay an operational cost levy to cover the revenue collection counterparty's operational costs alongside the collateral and reserve amounts. The revenue collection counterparty calculates how much the suppliers owe based on these figures, requiring them to also be monitored. Data is reconciled over a 14-month window and therefore will need to be securely stored long enough by the counterparty to allow this calculation to happen.
61. Data collection will need to be completed by the revenue collection counterparty, since they will have all the required information to do so. Monitoring data will also be collected by Ofgem as the regulator (with a statutory duty for consumers and finance) and the National Grid Electricity System Operator (NGESO).
62. The data collected will be used by the revenue collection counterparty and Ofgem to ensure the terms of the regulations are being fulfilled as required. The revenue collection counterparty will be the primary users of the monitoring data since they are the ones collecting it and will rely on the data to assess project progress and success. Ofgem will also be able to request the monitoring data should they want and in their role as regulator. They have a statutory duty for consumers and finance and therefore will need specific information to ensure they meet this duty. There are also information request provisions in the revenue regulations where the Secretary of State can request information from Ofgem, the nuclear licensee company and the revenue collection counterparty to assist in its policy making, so this could also present another way of monitoring.
63. The revenue channel includes several elements from the Contracts for Difference (CfD) mechanism,<sup>27</sup> and was designed to build on its success. This allows for learning from the CfD mechanism and its associated 2020 evaluation,<sup>28</sup> especially regarding these elements. One significant difference from the CfD evaluation is it used a counterfactual where projects which were not awarded a CfD but went ahead anyway. There is no such comparator for the revenue channel of the RAB. Furthermore, given the revenue channel is required for the RAB to be implemented, we cannot build a scenario in which the RAB runs without the revenue channel, making a direct counterfactual impossible.

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<sup>26</sup> 2020 data, under the Low Income Low Energy Efficiency metric. <https://www.gov.uk/government/statistics/annual-fuel-poverty-statistics-report-2022>

<sup>27</sup> The precise mechanism we are drawing from is outlined in The Contracts for Difference (Electricity Supplier Obligations) Regulations 2014, a copy of which is available on the UK Government legislation website at: <https://www.legislation.gov.uk/uksi/2014/2014/contents>.

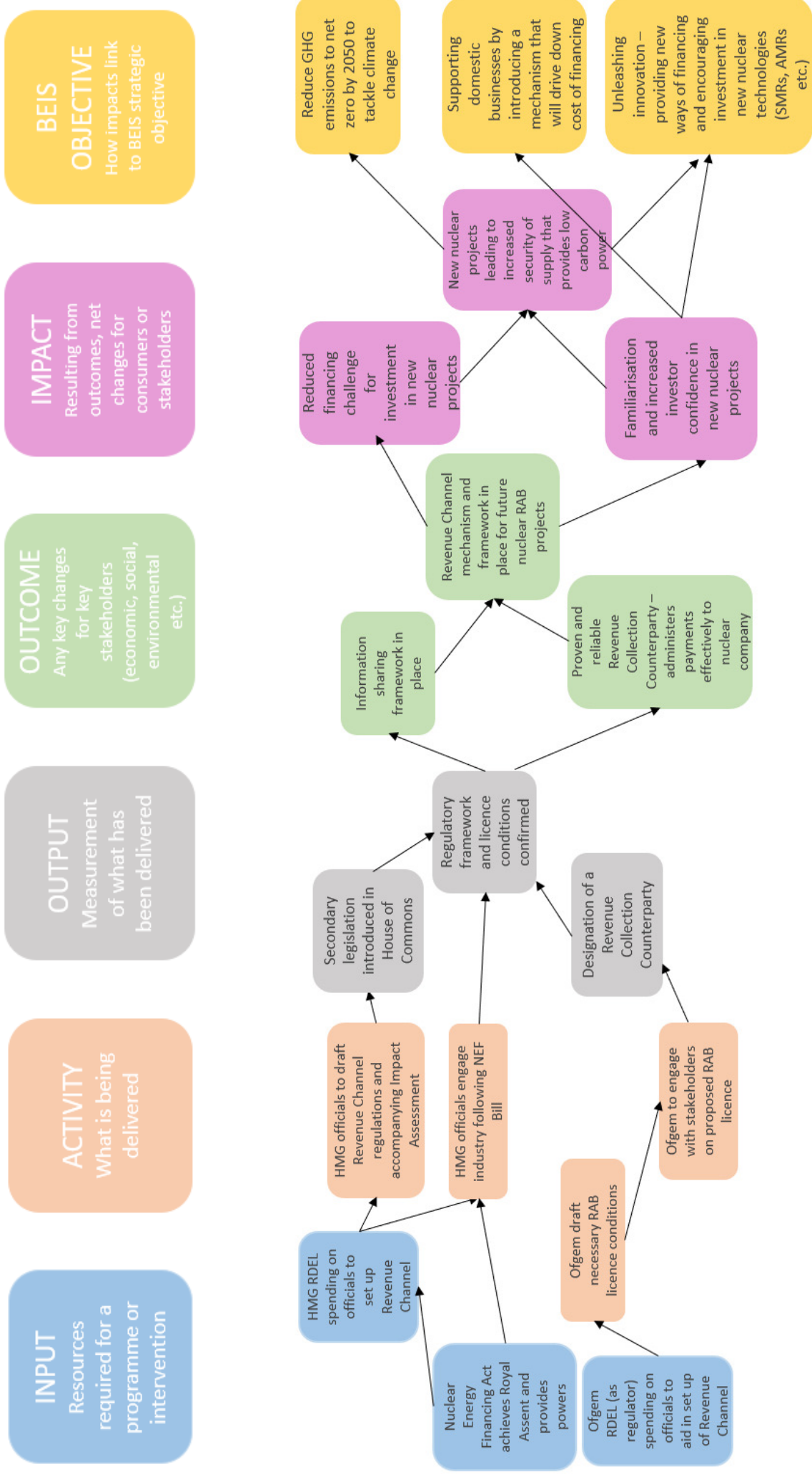
<sup>28</sup> Different strands of the CfD evaluation are available from the Government website here: <https://www.gov.uk/government/publications/evaluation-of-the-contracts-for-difference-scheme>.

64. The purpose of the evaluation will be to assess the extent to which the revenue channel is meeting its intended objectives. The evaluation will also explore how the required duties and regulations have been fulfilled. The high-level evaluation questions will be:
- a. Have the regulations been followed?
  - b. Have the right amounts been paid to the right companies, at the right times?
  - c. Has the counterparty fulfilled its duties towards the regulations and the revenue channel mechanism?
  - d. Have Ofgem fulfilled their duties towards the regulations and the revenue channel mechanism?
  - e. Has the SoS needed to transfer funds to make sure the relevant licensee nuclear company gets their money?
65. Answering these questions will be critical to finding out in what ways the mechanism is operating effectively and what ways it is not. Allowing amendments to be made to ensure it continues to operate in appropriate ways which are fit for purpose.
66. The revenue channel mechanism can be appropriately evaluated using a process evaluation. Given the lack of an available and directly comparable counterfactual, a theory-based process evaluation would be appropriate to assess success. The process evaluation should be conducted at a time when the mechanism has been operating long enough to ascertain the limits of its efficiencies. Some of the practical issues will emerge quickly through daily monitoring, but other questions will need longer before they can be rigorously assessed. The process evaluation should be conducted as early on as feasibly possible, potentially within the first 1-2 years of the mechanism being used for each project. A process evaluation for each phase (e.g. construction, operation, decommissioning) may be necessary to ensure the mechanism has effectively adapted to each phase's requirements.
67. There are advantages in bringing together the revenue channel and the other two core components of the RAB mechanism to evaluate the three components together as part of a much larger, holistic and more detailed evaluation. This would provide greater insight across the whole RAB. An impact evaluation would likely be most appropriate for such an evaluation to ensure the RAB has met its overall objectives for the project it was applied to. However, this is optional and has not yet been designed due to the infancy of the RAB mechanism.
68. The monitoring and evaluation processes will be used by HMG to ensure the project is proceeding as planned, given HMG can be a shareholder in any RAB project. Even in the case where HMG is not a shareholder, it would be appropriate for HMG to assess the monitoring and evaluation process at least periodically, to help ensure the project runs smoothly.
69. Human resource for monitoring and evaluation purposes should be met by a combination of parties given HMG are a shareholder, including HMG, the revenue collection counterparty and Ofgem.
70. The main external factors that will have an impact on the success of the intervention include changes of policy related to nuclear financing. Similarly, other changes in the market or sector might require the policy to be reviewed sooner or have the preferred option change.
71. Given the revenue channel's function as a mechanism through which the RAB operates, changes in the market or sector would have a more significant impact on the RAB than specifically the revenue channel. If extreme scenarios arise whereby suppliers come under extreme financial burden, then two options might be to extend the notice period for payments or allow more time to make payments. But these scenarios should not affect when the monitoring and evaluation is conducted since they would not contravene the high-level evaluation questions. Potentially, if more nuclear projects go on to use the RAB on the pathway towards up to 24GW of nuclear by 2050, the scale of the impact of revenue channel design could then be greater.
72. There will be scope for testing monitoring and evaluation ahead of the rollout of this plan to ensure data can be collected as required and that evaluations are fit for purpose. However, there would be more scope and time built-in to allow for more rigorous piloting and testing if this monitoring and evaluation plan is combined with the other two components of the RAB.

## Annex 1: Breakdown of policy options

Consultation Area	Policy Option 1: Do-minimum	Policy Option 2: “Improved”	Policy Option 3: “Going further”
<b>CA 2:</b> Information sharing between Ofgem and the revenue collection counterparty relating to the RAB payment	Ofgem confirms the RAB payment amount to the revenue collection counterparty. We propose revenue regulations include appropriate information sharing provision between the two.	As per Policy Option 1.	As Policy Option 1, however, further details will be included within the regulations.
<b>CA 3:</b> Wider Information Sharing	Information sharing provisions kept at a high level within the regulations.	As per Policy Option 1.	Regulations include further details around how information will be shared, including timings by which information must be shared
<b>CA 4a:</b> Notice period for interim levy rate	A three-month notice period as per the CFD ESO Regulations.	A one-month notice period.	As per Policy Option 2.
<b>CA 4b:</b> Notice period for total reserve amount	A three-month notice period as per the CFD ESO Regulations.	A one-month notice period.	As per Policy Option 2.
<b>CA 4c:</b> Notice period for individual reserve amounts	A notice period of around two and a half months (i.e. eight working days after the beginning of the preceding quarter).	A two and a half weeks’ notice period.	As per Policy Option 2.
<b>CA 5:</b> Secretary of State directions and terms of a revenue collection contract	No specification of the certain matters that must be covered by the terms of the revenue collection contract set out in the regulations.	Certain matters that must be covered by the terms contained in the revenue collection contract between the revenue control counterparty and the nuclear company are set out within the regulations.	As per Policy Option 2.
<b>CA 6:</b> Notification of the revenue collection Counterparty’s inability to carry out its functions	Regulations do not require the revenue collection counterparty to notify the Secretary of State in advance of the three-month formal notice period.	Regulations require the revenue collection counterparty to promptly notify the Secretary of State if it considers it likely that it may not be able to carry out its function.	As per Policy Option 2.
<b>CA 7:</b> Projecting future supplier charges	Ofgem calculates and confirms the RAB payment amount to the revenue collection counterparty followed by the revenue collection counterparty calculating and confirming future levy rates to suppliers.	As per Policy Option 1.	In addition to Policy Option 1, Ofgem would also give the revenue collection counterparty information to carry out its own calculation of upcoming supplier payment liabilities

## Annex 2: Theory of Change





## **Theory of Change: risks and assumptions**

In relation to the inputs, we assume that the Nuclear Energy Financing Act achieves Royal Assent to allow RDEL spending and that the RDEL spending is delivered to allow the set-up of the revenue channel. Following these, activities include engagement with industry and stakeholders, which pose a risk if the necessary licence conditions aren't accepted by stakeholders. The 'Revenue stream for the nuclear RAB model' secondary legislation is subsequently introduced in the House of Commons as an output. There is a potential risk that the counterparty does not administer the correct payment or develops issues which prevent payments being transferred, however the appointment of Ofgem to oversee this should help mitigate this risk since they have the required infrastructure and experience to plan for this. If the preferred option is implemented, the policy objectives will be achieved as outcomes. There is a risk that if a nuclear project is not designated with a RAB model and hence does not enter into a revenue collection contract, the impacts (and resulting department objectives) are not fully realised.

## Annex 3: Modelling Assumptions

### Construction cost

The modelling assumes a construction cost of £6,400/kW<sup>29</sup> (2021 prices) this has been calculated using data from the Hinkley Point C project, the only nuclear power plant currently under construction in GB.

Large-scale infrastructure projects tend to cost more and take longer to build than expected, known as optimism bias. Therefore, the construction cost assumption has been increased using data from past nuclear power projects.<sup>30</sup>

On average, the construction cost of a nuclear power plant is around:

- 20% higher than expected at the point of FID (Final Investment Decision) based on data from nth of a kind nuclear power plants built in Europe,<sup>31</sup> and
- 100% higher than expected at the point of FID based on data from all nuclear power plants build after 1990.<sup>32</sup>

Applying these optimism bias assumptions estimates construction cost assumptions of 7,700/kW and £13,000/kW.<sup>33</sup>

The optimism bias data compare the expected cost of new nuclear power plants at the point of FID, without any risk contingency applied. There is no publicly available data on the level of risk contingency which was applied to Hinkley Point C at FID. Therefore, the £7,700/kW and £13,000/kW construction cost figures are expected to be overestimates.

### Pre-licensing costs and infrastructure costs

Assumptions on pre-licensing costs and infrastructure costs have been taken from an Electricity Generation Costs report prepared by LeighFisher.<sup>34</sup> Pre-licensing costs are assumed to be £280/kW and the infrastructure cost is assumed to be £14m.<sup>35</sup>

### Cost of finance

The cost of financing a new nuclear power plant has been modelled by applying hurdle rate assumptions to the construction cost, pre-licencing costs and infrastructure cost. A hurdle rate is the minimum return needed to incentivise investment.

The central hurdle rate assumption is 5% for a new nuclear power plant funded through a RAB. This assumption is based on the allowed return in other regulated industries within GB.<sup>36</sup> This allowed return under a RAB for a new nuclear power plant may be higher or lower than 5%. If interest rates are relatively low, that would lead to lower allowed returns. Alternatively, if the risk to investors of a new nuclear plant, even with a RAB model, is relatively high, that would lead to higher allowed returns.

Sensitivity analysis has been carried out to illustrate uncertainty in the hurdle rate for a new nuclear power plant. The low hurdle rate assumption is 4% and the high hurdle rate assumption is 6%. This range covers a number of allowed returns in other regulated industries within GB.

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<sup>29</sup> An initial construction estimate of £18.1bn has been converted into 2021 prices and divided by the power output of the plant to calculate this assumption.  
<https://www.edf.fr/sites/default/files/contrib/groupe-edf/espaces-dedies/espace-finance-en/investors-analysts/credits/rating/moodys-ic-edf-2019-09-26.pdf>

<sup>30</sup> Technical annex, nuclear data analysis, National Infrastructure Commission.  
<https://nic.org.uk/technical-annex-nuclear-data-analysis-nic/>

<sup>31</sup> The 20% assumption is based on the median value, rounded to one significant figure.

<sup>32</sup> The 100% assumption is based on the median value, rounded to one significant figure.

<sup>33</sup> 2021 prices.

<sup>34</sup> See page 134 of Electricity Generation Costs report.

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/566803/Leigh\\_Fisher\\_Non-renewable\\_Generation\\_Cost.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/566803/Leigh_Fisher_Non-renewable_Generation_Cost.pdf)

<sup>35</sup> 2021 prices.

<sup>36</sup> See the pre-tax WACC figures on page 28 of the UK Regulators Network Cost of Capital – Annual Update Report – 2020.  
<https://www.ukrn.org.uk/wp-content/uploads/2020/12/2020-UKRN-Annual-Cost-of-Capital-Report-Final-1.pdf>

## Other cost assumptions

The modelling is based on assumptions on the cost of building and financing a new nuclear power plant. It does not include assumptions on the cost of running or decommissioning a new nuclear power plant.

## Construction period

For the purpose of this modelling, the construction period is the length of time between a new nuclear power plant reaching FID and the point where the first unit of a nuclear power plant begins generating electricity. The construction period is assumed to be 9 years, based on data from the Hinkley Point C project. The construction period is also adjusted for optimism bias, using the same dataset that was used for the construction cost assumptions.

On average, the construction period of a nuclear power plant is around:

- 40% higher than expected at the point of FID from data of nth of a kind nuclear power plants built in Europe;<sup>37</sup> and
- 90% higher than expected at the point of FID from data of all nuclear power plants built after 1990.<sup>38</sup>

Applying these optimism bias assumptions estimates construction schedule assumptions of 13 and 17 years.

The optimism bias data compare the expected construction period of new nuclear power plants at the point of FID, without any risk contingency applied. There is no publicly available data on the level of risk contingency which was applied to Hinkley Point C at the point of FID. Therefore, everything else being equal, the 13- and 17-year construction period figures are expected to be overestimates.

## Other technical assumptions

The other technical assumptions used in this modelling are based on a combination of data from the Hinkley Point C project and the Electricity Generation Costs report which was prepared by LeighFisher:

- Plant operating period – the time between a unit of a nuclear power plant coming online and closing. Assumed as 60 years (LeighFisher report, page 134).
- Maximum power output – the level of power, in the form of electricity, produced by the plant when running at full capacity. Assumed as 3,300 MW (Hinkley Point C planning assumption).<sup>39</sup>

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<sup>37</sup> The 40% assumption is based on the median value, rounded to one significant figure.

<sup>38</sup> The 90% assumption is based on the median value, rounded to one significant figure.

<sup>39</sup> This assumption has been rounded to 2 significant figures. The Hinkley Point C planning assumption was 3,260MW.