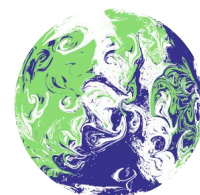




Department for
Business, Energy
& Industrial Strategy

RAB Model for Nuclear

Government Response to the consultation on
a RAB model for new nuclear projects



**TOGETHER
FOR OUR
PLANET**



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Introduction

For new nuclear projects to compete with other forms of low carbon electricity, it is essential that there is a sustainable funding model that can attract private finance at a cost that represents value for money (VfM) to consumers and taxpayers. Our assessment concluded that, by providing regulated revenue and returns to investors, a RAB (Regulated Asset Base) model had the potential to reduce the cost of raising private finance for new nuclear projects, thereby reducing consumer bills, while still preserving incentives for the private sector to complete nuclear projects to time and budget.

On 22 July 2019 the Government launched a consultation on a RAB model for new nuclear projects that would have the following features (described in further detail in the consultation¹):

- a) Government protection for investors and consumers against specific remote, low probability but high impact risk events, through a Government Support Package (GSP);
- b) A fair sharing of costs and risks between consumers and investors, set out in an Economic Regulatory Regime (ERR);
- c) An economic regulator (the ‘Regulator’) to operate the ERR; and
- d) A route for funding to be raised from energy suppliers to support new nuclear projects, with the amount set through the ERR, during both the construction and operational phases (the ‘Revenue Stream’).

The consultation ran from 22 July 2019 to 14 October 2019, during which we engaged with interested stakeholders and captured a range of views on the principles of a RAB model and its applicability to deliver future new nuclear projects, alongside the existing CfD (Contract for Difference) model.

We posed six questions to stakeholders in the consultation as listed below:

Question 1: Have we identified a model which could raise capital to build a new nuclear power station and deliver value for money for consumers and taxpayers?

Question 2: Do you have any comments on the components of the Economic Regulatory Regime as described?

Question 3: Do you have views on how consumer interests are protected under the proposed approach? What else should be considered to protect consumer interests?

Question 4: Do you agree that consumer risk sharing could be value for money for consumers if it achieves a lower expected overall cost for consumers compared to a Contract for Difference model?

Question 5: Do you have views on the potential way to design the revenue stream for a nuclear RAB model that we describe, and are there alternative models we should consider?

¹ <https://www.gov.uk/government/consultations/regulated-asset-base-rab-model-for-nuclear>

Question 6: Do you have views on our proposed approach to assessing a new nuclear project under a nuclear RAB model and determining whether it is value for money for consumers and taxpayers?

We have set out a glossary of terms used in annex 1.

This document provides a summary of responses received to the consultation questions, highlighting some of the key comments from respondents on the proposed RAB model and its mechanisms, as well as the Government's response to these comments.

Summary of Responses

1. The nuclear RAB consultation sought views from stakeholders on whether a RAB model was a viable means to finance new large-scale nuclear projects. The consultation also sought views on its high-level design principles, including risk sharing arrangements. We consulted on the basis that the model could be introduced alongside the existing financing model for nuclear projects, the CfD model, as opposed to a replacement. The decision on which model to use for specific projects would be made on a case-by-case basis.
2. We received 104 responses from organisations, the list of which can be found in annex 2. For the purpose of analysis, we have grouped these stakeholders into the following categories:
 - Developers
 - Nuclear sector organisations
 - Wider energy organisations
 - Suppliers
 - Consumer Groups
 - Environmental Groups/NGOs
 - Local communities/other government bodies/ /Local Government
 - Government-owned Companies
 - Investors
 - Other Governments
 - Other Trade Associations
 - Trade Unions
 - Regulators
 - Engineering Organisations
 - Universities/Research Bodies /Consultancies
 - Law Firms
3. Responses from industry were supportive of the proposed high-level design principles of the RAB model, with many seeing it as having potential to substantially increase the pool of investors in nuclear to include financial institutions such as pension funds and insurers. By providing greater certainty for the recovery of investment through a secured, lower, rate of return in the early stages of a project this should lower the cost of financing. This in turn should lower costs of electricity to consumers. There were broad views that the Government should provide more details on the specific design of the RAB model in order to get more informed feedback from organisations.

4. Responses from environmental groups and NGOs in general suggested that that new nuclear was unlikely to be value for money given the falling price of renewables and that the application of RAB for nuclear would provide preferential treatment to nuclear over renewables and affect market competitiveness. However, almost all of these groups were opposed to nuclear in-principle, citing security concerns, risk of proliferation and waste management.
5. We received over 9,000 responses from individuals. The majority of these individual responses contained very little substantive information and did not directly address the questions or issues raised in the consultation. Most of these responses disagreed in principle with nuclear and although these emails do not explicitly state that they were sent as a result of an organised campaign, many of them share the same content. A minority of cases where responses from individuals focused on the RAB model itself were negative, expressing broad concerns with the concept of consumer charging for a nuclear project during the construction phase. We also received separately an online petition with over 36,000 signatures requesting that RAB is not used to finance new nuclear projects.
6. Substantive responses from members of the public who were not in-principle opposed to nuclear were generally supportive of the RAB model, highlighting potential for RAB to lower costs of financing new nuclear projects and in turn lower costs to consumers. They also welcomed the jobs that could be created as a result of facilitating new nuclear projects.

Question 1:

Have we identified a model which could raise capital to build a new nuclear power station and deliver value for money for consumers and taxpayers?

7. In the consultation, we proposed the use of a nuclear RAB model to:
 - Enable the delivery of new nuclear projects by attracting private sector capital;
 - Incentivise delivery of projects on schedule and within budget through competition and robust regulatory mechanisms and risk-sharing with investors; and
 - Reduce cost to consumers through driving down the cost of capital.
8. The consultation proposed that a RAB would be comprised of an Economic Regulatory Regime (ERR) that establishes the cost and risk sharing between consumers and investors, along with a Regulator to operate it; a Revenue Stream as a route for funds to be raised from suppliers to projects; and a Government Support Package (GSP) that protects investors and consumers from low probability, high impact risk events.
9. The majority of respondents to the consultation provided substantive answers to this question. In some cases, their general or introductory comments were also relevant to their views on this question and have been considered in this context.
10. Responses from developers of nuclear projects were generally supportive of the RAB model, citing its potential to attract large amounts of private capital. They pointed out the significant appetite in the UK investor market for the debt and equity cashflows that would be produced by the RAB model. Developers also emphasised the opportunity to attract private finance at different stages of the project's lifecycle, suggestions that were made include granting a RAB licence early enough to allow debt and equity investment in the project to support the pre-construction phase and allowing a revenue stream prior to operations to reduce the lag between investment and return and facilitate investment in the construction phase.
11. Amongst Nuclear Sector Organisations, there was also generally support for the RAB model, citing it as a tried and tested method in delivering large scale infrastructure projects such as the Thames Tideway Tunnel and Heathrow Terminal 5, which should provide confidence for investors. A number of comments were made on the issue of risk reduction, highlighting the importance that information on risks is made available in order for investors to understand, assess and cost them, as opposed to focusing on transferring risk between different parties. There was a suggestion that a risk profile should be set out for each stage of the project to better understand the risk and price it properly. Another suggestion to reduce risk was to provide sufficient time to raise investor funds for the development phase of the project to ensure a mature design and test the project feasibility, ahead of taking the project to financial close.
12. A number of respondents used this question to provide comments on the funding mechanism. Some consumer groups and NGOs noted that under the RAB model some costs overrun risks would be passed on to consumers. In particular, respondents noted historic cost overruns with nuclear and that the model would potentially lock consumers into

higher prices. On the contrary, developers, nuclear sector and wider energy organisations noted that a RAB model could lead to a reduction in the cost of financing through regulated returns during construction and risk sharing between consumers and investors facilitating private sector investment and ultimately minimising overall cost to consumers. Responses from suppliers were mixed on this issue, with some suggesting the value for money would depend on the arrangements under which construction risks are managed and how returns are paid to investors, and that this will only be achieved if the correct risks are passed on to consumers and that these are mitigated appropriately.

13. Several responses suggested that the nature of the ERR was key to determining whether the consumer impact was appropriate, with some stating that consumer funding was more regressive than taxpayer funding. The suggestion was also made that energy-intensive industries might not have the ability to pass costs down to their customers in the way that retail electricity suppliers could to their consumers.
14. Several respondents suggested that the RAB model might be best suited to natural monopolies and felt that some degree of competition in the selection of projects may be necessary to control overall costs.
15. A range of respondents, from industry organisations to NGOs, suggested that if the RAB model could be successfully developed then it should also be made available to other technologies: CCUS was frequently mentioned, but other suggestions included tidal, large-scale battery storage, or offshore wind. Other responses noted that large-scale plants were not the only form of potential new nuclear projects, and it would be important to consider financing support (not necessarily through a RAB model) for smaller and more innovative modular reactors.
16. A final point made by respondents was the importance of early decision making from Government. Several respondents in the nuclear sector highlighted the need for clarity on the Government's position towards large-scale nuclear, given the importance of maintaining a pipeline of deployable projects and supply chain capability. The need for national-level decision-making was also mentioned by consultees at local level who stressed that continuing uncertainty in relation to a particular project could be highly disruptive.

Question 2:

Do you have any comments on the components of the Economic Regulatory Regime as described?

17. For the ERR, we proposed a regime whereby the regulator granted a licence to a project company, allowing it to charge an 'Allowed Revenue' in return for construction and operation of the asset. The Allowed Revenue amount would be determined by the Regulator. Our initial analysis indicated that it would likely be more appropriate for the regulatory regime to be set ex-ante.
18. We stated in the consultation that our aim for the regulatory regime was to achieve a balanced risk sharing and incentivisation that would incentivise investors to control project

costs and minimise consumer and taxpayer risk, whilst ensuring that a project could be financed at an efficient cost of capital.

19. In general, developers, nuclear energy organisations, suppliers, consumer groups, investors, trade unions and universities/research/consultancies provided more substantive responses to this question.

Economic Regulatory Regime

20. Respondents to this question were in broad agreement that the components of the regulatory regime made sense. In particular there was general support for the ex-ante approach to construction risk allocation, because it provides clarity on target construction costs and risk allocation to investors, consumers and suppliers, incentivises investors to minimise construction costs and allows investors to understand and price their exposure. A number of consumer groups supported ex-ante as the preferable option but caveated that this was not a guarantee of value for money if, for example, the allowances are set at too high a level.

21. On the length of the project licence, some respondents indicated that it would be beneficial for the licence to run across the economic life of a nuclear asset, so as to reduce costs to consumers. Consumer groups noted that any subsidy in place for nuclear projects should consider a consumer's ability to pay and that the price impact of a nuclear RAB funding model should be considered in the context of broader consumer electricity costs (a subject outside of the scope of this consultation).

22. Generally, it was considered by respondents that a RAB's 'building block' methodology, was a good idea as it makes it clear to all parties how the Allowed Revenue is calculated.

23. Investors said that the investment proposition created by the regime should aim to look comparable to other types of investable infrastructure projects. They considered that a long-term, regulated cashflow would be attractive. Investors identified that a significant window prior to any regulatory reset in the operations period would help drive a lower cost of capital.

24. Investors noted that due to the potential lack of relevant nuclear, construction and operational experience among investors, strategic equity (investment on the part of the project developer) would likely be required. Visibility on the project, the resolution of project issues, and certainty regarding how decisions would be made during the project, were also flagged as key issues that would impact required returns. From an investor perspective, a return during construction was highlighted as being vital to financeability, given the volume of investment sought and the length of the construction period.

25. Investors and their advisers also noted that the overall funding requirement for a nuclear power project would be significant and were uncertain as to whether there was market capacity in the context of the investor profile sought. They therefore raised questions as to whether a competitive finance-raising process could be achieved. It was questioned whether, in this scenario, an administrative return, set by the Regulator, may be considered (acknowledging the limited number of relevant benchmarks).

26. Developer responses asked for clarity in how development costs (those committed by a developer prior to a decision to progress with a project) would be treated, and whether these would be recoverable under a RAB regime. Some developer respondents also questioned whether a regulatory regime could in fact apply to the development phase of a project.
27. Nuclear sector organisations noted that the ringfencing of the funded decommissioning programme costs was crucial and should be continued, although they questioned whether this would work in the same way as with Hinkley Point C under a RAB.
28. There was broad consensus across the majority of respondents that the sharing of costs with consumers in the event of a major construction cost overrun was potentially unpalatable, given examples of nuclear construction overruns globally and in the UK. Consumer groups noted that it would be important to have clarity on what risk sharing arrangements were likely to be in the event of an overrun.
29. Respondents also asked for more detail on the operational phase of a project, which was touched on quite lightly in the consultation in comparison to the construction phase. Some respondents said that plant availability may require risk-sharing in operations – this should not necessarily impact overall consumer costs but focus on cash-flow smoothing. They added that, in any event, the regulatory regime design should clearly incentivise maximum long-term generation.

Role of the Regulator

30. Whilst the ONR was mentioned by some as a potential Regulator, the majority of respondents indicated that safety, security and environmental regulators should be kept independent.
31. Many indicated that the central criteria for a Regulator were its competence and experience, and that investability would likely require a clear duty to finance on the Regulator. It was felt by some respondents that, given the nuclear sector is not currently subject to economic regulation, development of this proposal could bring a good opportunity to apply lessons learned from other regulated assets and construction projects.
32. It was noted that the Regulator would need to develop a broad range of skills across the lifecycle of a project. Respondents commented that this would be particularly important for a nuclear project as the Regulator would likely find it difficult to benchmark (due to available proxies) and validate that costs have been efficiently incurred.
33. Respondents highlighted that the cost of the Regulator function would likely be passed to consumers, and therefore questioned whether this would be a part of the VfM analysis.

GSP

34. Respondents raised various questions associated with the suggested Funding Cap. For consumer groups, it was not clear whether consumer payments would increase above this level. Meanwhile, investors indicated that, due to market capacity, the Funding Cap would not be able to be set so high that investors could not supply the required capital, or, if reached, result in returns being so low that it would not be worth investing. It was noted that the comparison with the Thames Tideway Tunnel (TTT) project, discussed in the consultation, was not fully analogous in the context of nuclear as the Funding Cap may have to be set at a significantly higher level (it was set at 30% above the Base Case forecast for TTT) in order to be considered remote.
35. The general view from investors and developers regarding the GSP was that it would need to provide protection for remote cost overruns, availability of debt finance and certain operational risks, to make a nuclear project investable. It would also need to be clear in the GSP how certain items, such as provisions for nuclear third-party liability, and state aid challenge risk, would be addressed.

Question 3:

Do you have views on how consumer interests are protected under the proposed approach? What else should be considered to protect consumer interests?

36. As part of the ERR, we proposed that the Regulator would be responsible for protecting consumer interests, taking into account the project company's ability to finance the project, whilst working with other environmental, safety and security regulators. The GSP would also protect consumers from exposure to high impact, low probability risks such as cost overruns above a certain threshold, debt market disruption, certain uninsurable risks, and political risks.
37. In general, developers, wider energy organisations, consumer groups, investors and universities/research/consultancies gave more substantive responses to this question.
38. There were a range of views offered on how consumer interests are protected under the proposed approach, as well as several suggestions on additional mechanisms to protect consumer interests. Some respondents withheld ultimate judgement citing insufficient detail in the consultation, particularly surrounding the GSP.

Consumer Impacts

39. A number of respondents suggested that taxpayer funding, rather than consumer funding, during the construction phase would be preferable. A variety of mechanisms were suggested to reduce risk during construction, including mechanisms to compensate consumers in the event of non-delivery or delay such as 'off-ramps'. Other suggestions included establishing a competitive process (i.e. comparison of alternative low-cost carbon generation projects or between different nuclear projects) to deliver lowest cost, and the input of external bodies to scrutinise the commercial terms of the project.

40. Others said that a RAB would only be capable of protecting consumer interests if applied to a suitable project, not on a technology or design not yet operating or built anywhere in the world, or on a new design still in development.
41. Local Governments respondents and NGOs also stressed the need to consider the impacts of a project on local residents and the local environment, whilst wider energy organisations and consumer groups highlighted the impact of increased costs on energy intensive industries and vulnerable consumers.

Risk Sharing

42. There were differing views on the overall risk balance under the RAB between investors and consumers. A number of individual respondents and consumer groups stated that the risk balance was tilted in favour of investors. They commented that nuclear new build projects have historically been subject to significant overspend and time delays and under the RAB it would be consumers who bear some of these risks. Many cited the example of Hinkley Point C and asked whether consumers should be paying for electricity before it is generating, and whether compensation would be provided in the event of a plant never reaching completion.
43. On the other hand, investors and developers raised concerns that moving too many risks onto them would push up the cost of capital and construction, reducing consumers the ultimate benefit to consumers from lower costs. Developers were particularly concerned about development risk and support from Government. They noted that placing all development risk on developers is not sustainable as it disincentivises any de-risking activities which are not required for FID. They were in favour of development support from Government, arguing that it could also widen technology choices beyond Government-backed suppliers and could increase opportunities for the UK supply chain.
44. This was also supported by investors, nuclear sector organisations and the law firm respondent who felt that the lack of development support would increase the risk of cost overruns on consumers and potentially discourage investment.
45. In order to mitigate the risk of cost and time overruns, respondents emphasised the importance of project scrutiny by both the Regulator and Government. A consistent theme was the need for the Regulator to take a robust role in protecting consumer interests, rigorously monitoring construction progress, and in determining the Allowed Revenue. A number of respondents suggested that Ofgem was best placed to fulfil this role.
46. The majority of respondents also emphasised the importance of Government oversight and scrutiny of the costs of the project and mentioned that how the Government assessed 'value' should be clarified. Of those who commented on this question, there was broad agreement that an ex-ante approach, based on the information available, would be a more reasonable and cost-efficient assessment process.

Question 4:

Do you agree that consumer risk sharing could be value for money for consumers if it achieves a lower expected overall cost for consumers compared to a CfD model?

47. For the ex-ante risk sharing arrangement, we proposed a baseline construction cost which would be set when the RAB licence is granted. Should project costs exceed the baseline the extra costs would be reviewed by the Regulator or an independent technical assessor. Cost overruns that were not excluded from the RAB would be shared between investors and consumers through suppliers, with the ratio of risk sharing being calibrated when the ERR is set for a particular project. This differs from the CfD model which leaves construction and operating risks with the investors.
48. In general, developers, nuclear sector organisations, wider energy organisations, suppliers, NGOs, investors and engineering organisations gave more substantive responses to this question. There was a range of views expressed as to whether a RAB model could offer value for money compared to a CfD model.
49. A general comment from respondents was that further information on the proposed RAB model would be required to judge whether a RAB provided comparatively better value for money than a CfD. Some pointed out the differences between the Thames Tideway Tunnel Project and a nuclear new-build and suggested that the value for money of a RAB nuclear project would depend on how the regime for this specific technology was developed.
50. Some respondents also said that a CfD model is not an appropriate comparator to a RAB model, as they felt the CfD was not financeable in the current market.
51. Local Government respondents and communities noted that value for money should also include an assessment of the wider benefits and impacts of a new nuclear project to local communities.

Positives of RAB over CfD

52. Developers, investors and construction organisations noted that a RAB model has the potential to reduce the cost of capital compared to a CfD by both sharing the risks of constructing a new nuclear power plant with consumers and providing a return to investors during construction resulting in lower equity/debt returns being required over the life of the project. Cost of capital was stated by some respondents to be by far the largest element of the cost of a nuclear project, so lowering the cost of capital would result in a lower project cost overall.
53. Respondents also pointed out that a CfD requires developers to include high levels of contingency in the Strike Price, and that this cost is passed on to consumers regardless of whether the risk materialises or not. Under a RAB, the cost would only be passed on to consumers if the risk were to materialise.

Negatives of RAB over CfD

54. Consumer groups and NGOs argued that even if a RAB model resulted in a lower cost project overall, this would be at the cost of significant risk transfer to consumers and it was not appropriate to share the risks of constructing a new nuclear project with consumers given the scale, nature and track record of nuclear projects. Some responses noted that in this respect a CfD was preferable as it placed the construction risk fully on the developer, albeit at a higher overall cost.
55. Wider Energy Organisations provided more mixed responses to this issue, citing that CfD auctions for alternative scalable low carbon and proven technologies have consistently delivered on time and on budget, and that for CfDs, consumer exposure to construction risk is fixed. It was also suggested that it is less clear if consumer risk sharing in a RAB model could be good value for consumers for “first of a kind” projects compared with a CfD model, as there are additional risks in bringing forward “first of a kind” projects such as uncertainties of constructability, operation, delivery of output performance and availability consistent with design.

Question 5:

Do you have views on the potential way to design the revenue stream for a nuclear RAB model that we describe, and are there alternative models we should consider?

56. In the consultation, we described the Revenue Stream for a nuclear RAB as a route for funding from suppliers to the project company, with revenue likely to be channelled to the project company in both the construction and operational phase, and a variable £/MWh price to be adjusted by the Regulator as needed. The consultation proposed some high-level principles for how the Revenue Stream could be designed.
57. In general developers, wider energy organisations, investors and universities/research/consultancies gave more substantive responses to this question.
58. Responses to this question were varied and included comments on the design of the suggested Revenue Stream as well as ideas for potential alternatives. Detailed comments primarily came from developers, investors, suppliers, nuclear and wider energy organisations.

Difference Payment

59. A few respondents expressed support for the Difference Payment structure outlined in the consultation: including linkage to a market reference price; a design based on CfD features adapted for a nuclear RAB regime; and collection of the payment through electricity bills.
60. However, many respondents expressed the view that the Difference Payment should be provided through general taxation instead of a levy through the electricity bill, especially in the construction phase. This is because the regressive nature of electricity bills and volumetric charging would lead to an unfair impact on people who are on low incomes and vulnerable to fuel poverty, compared to general taxation which is progressive in nature.

61. A few respondents suggested an alternative structure to the one suggested – allowing for the Project Company to enter into a Power Purchase Agreement (PPA) with all suppliers based on their market share and for an intermediary body to auction the power on behalf of all suppliers. An alternative suggestion was that the National Grid ESO could become counterparty to a PPA with the Project Company.
62. Another alternative that respondents proposed was for the revenue payment to be calculated based on the availability of the plant instead of actual power output. This would mitigate investors' concern about changes in future energy market arrangements outside their control which might impact the output of the project.
63. Many of the developers and retail suppliers responding to the consultation emphasised the need for the allocation of the Difference Payment to treat all suppliers on a demonstrably fair and equal basis, and suggested establishing a working group consisting of suppliers and BEIS officials (similar to the one established during EMR development) to discuss any significant deviations from the current CfD.
64. The stability and predictability of the Difference Payment was also highlighted by retail suppliers as a significant factor in the viability of their business. This is because suppliers agree fixed term and fixed price contracts with their customers on long term contracts and if the amount payable is unpredictable and subject to volatility, suppliers are likely to charge the risk premium this requires back to their consumers. It was suggested that the forecast for Difference Payments should be provided at least 24 months in advance with indicative figures up to 5 years in advance, to allow for predictability and long-term planning. Reconciliation of a charging year should be carried out in the subsequent year to allow suppliers to reflect in their tariff offering.
65. Some industrial bodies also suggested that energy intensive industries should be exempted from the Difference Payment charges, citing the effect it would have on their competitiveness.
66. Other considerations mentioned by respondents included the need to have clear legal grounds for revenue collection; the need for a high degree of certainty in order to achieve a strong investment grade credit rating; and provision of an optimum settlement frequency in order to balance between reducing potential build-up of debt and avoidance of unnecessary administrative burdens.

Risk Allocation

67. Developers noted that components of the ERR, such as the charging mechanism (if based on availability rather than output) and availability risk (e.g. disruption of revenue due to unplanned and prolonged plant outage) would need to be reflected in the design of the revenue model. For the latter, a cashflow smoothing mechanism was suggested in the event of a prolonged outage to ensure debt obligations are met and reduce the cash reserves needed to mitigate availability risks. At the same time investors and the project company should be incentivised to manage the availability risk as well.
68. These groups also stated that investors would need protection to some degree from i) price risks, ii) demand risks including volume and curtailment, iii) supplier credit risk and iv)

intermediary body insolvency risks, and that failure to do so would lead to a higher cost of capital.

69. Suppliers also emphasised the need for the level of collateral and other forms of reserve required from the revenue payments to be carefully calibrated.

Wholesale and Retail market

70. Suppliers and industrial users noted that BEIS should assess the impact of nuclear RAB implementation on the GB electricity market (including capacity market, electricity wholesale and flexibility markets) and suggested that developers should not be insulated from the wider electricity market including negative market prices.

Question 6:

Do you have views on our proposed approach to assessing a new nuclear project under a nuclear RAB model and determining whether it is value for money for consumers and taxpayers?

71. The consultation highlighted the need for a robust process of structured diligence to assess whether a new nuclear project should be granted a nuclear RAB licence and GSP. It was envisaged that this could be structured over a number of decision gates to allow the Government and Regulator to assess the project's deliverability, risk, value for money, broader strategic and societal implications, and add conditions to a RAB licence (such as value for money, State Aid compatibility, industry best practice).

72. The majority of respondents to the consultation provided substantive answers to this question. There was general support for a structured assessment process, but these came with caveats on the need for further detail. Comments on eligibility were broad with suggestions ranging from proven technologies to first of a kind, as well as different kinds of energy technologies including nuclear and renewables.

Assessment and Assurance Process

73. The majority of respondents supported having a structured process and decision gates as part of the assessment process but felt that further detail was needed in terms of parameters and timing.

74. Developers noted that the process was lacking detail in terms of the documentation required for licence grant, the Government's position on the State aid rules, and how the process would interact with other regulatory processes such as NSL, DCO, and environmental permitting.

75. Regarding the benchmarking process, nuclear sector organisations suggested that a combination of top-down comparison against benchmarks with bottom-up validation costs would be effective, whilst investors supported global benchmarking system as well as local impacts. NGOs queried whether there were any reliable nuclear benchmarks against which a new project could be measured by the Regulator.

76. On costs, retail suppliers noted that assessing these will be difficult and highlighted the lack of clarity on how the Government intends to do this reliably. Engineering organisations also had similar comments and queried Government's ability to confidently estimate costs. Local government and communities noted that costs to avoid, mitigate and compensate local impacts, as well as community benefits should be included in cost assessment.
77. In terms of timings, developers noted that clarity and commitment to timeframe is needed to encourage investor and developer engagement with the process. Investors said that VfM and assurance processes would need to be completed at least 12 months before financial close to allow investors sufficient time to carry out their due diligence.

Eligibility

78. Regarding project eligibility for RAB, comments were wide ranging on both nuclear specific and wider energy technologies. Developers proposed various eligibility criteria including the developer's project delivery experience, ability to obtain Generic Design Assessment (GDA), progress towards DCO, degree of developer backing, development of a detailed and realistic execution plan and demonstration of project deployment internationally.
79. A number of nuclear sector organisations suggested that first of a kind technology, such as small modular reactors (SMRs), could be appropriate for RAB. Responses from academia also reflected this, suggesting RAB could potentially offer more attractive terms to less mature technologies like SMRs to encourage development and hedge costs and risks.
80. On the other hand, some local government respondents and communities suggested that RAB would be more suitable for proven technologies.
81. Beyond nuclear, respondents from wider energy organisations and NGOs raised the issue of RAB financing for renewables. Wider energy organisations noted that tidal range power and offshore renewables in general should be eligible for RAB. However, some respondents said that RAB did not seem to offer any significant benefits for financing renewables over CfD mechanisms, and that instead there could be a role for RAB in delivering supporting infrastructure for renewables and that options should remain open. NGOs questioned why RAB was not applied to the development of renewable energy and why it has not been applied to developing energy storage solutions to combat the intermittency of renewables.

VfM

82. The majority of industry organisations, such as developers, nuclear and wider energy organisations, were in favour of VfM assessments taking into account different technologies when comparing options. Developers noted that comparative scenarios in the VfM test should be risk-weighted to recognise the feasibility of less established technologies. This was echoed by both nuclear sector and wider energy organisations who agreed that the VfM test needs to recognise and fairly compare alternatives to nuclear, taking into account the different characteristics of technologies when comparing options. It was also noted that in terms of counterfactuals, the VfM test should consider potential cheaper technologies becoming available within a proposed nuclear project's 60-year lifetime.

83. These organisations also suggested that the VfM test should be framed around delivery of the 2050 net zero target at lower total system cost to consumers, considering wider socio-economic benefits. This echoes suggestions from investors that the Government consider wider environmental, social and corporate governance (ESG) factors in its assessment.
84. Developers also suggested potential benefits that should be taken into account in the VfM test such as taking advantage of the waste heat produced during electricity, hydrogen production, as well as reduction in nuclear costs for each subsequent project through lessons learned. Trade unions noted that VfM should include labour market and prosperity effects in line with the HMT Green Book.
85. Outside of nuclear industry organisations, a number of respondents questioned whether nuclear can represent VfM and were sceptical about Government's ability to calculate VfM based on experience with Hinkley Point C and other nuclear projects worldwide. NGOs noted several issues that should be considered in VfM assessment such as the long construction time and the absence of carbon savings during the construction period, the cost of long-term storage of waste, the costs and risks of nuclear accident and the general psychological burden on the population associated with potential risks.
86. Local communities and Local Government respondents commented that the cost of delivery of supporting infrastructure for new nuclear development, as well as the potential benefits resulting from it, should be incorporated into the VfM test. Other issues that were suggested for consideration were the costs associated with managing security and non-proliferation activities.

Other Regulatory Processes

87. A number of industry organisations raised the question of how the assessment process fits into wider regulatory processes such as NSL and DCO process. Developers, local Government respondents and communities acknowledged that the RAB assessment process and other regulatory processes could and should complement each other, for example the reference to wider strategic and societal factors in the RAB assessment process will be relevant to the DCO.
88. On the other hand, NGOs raised concerns about potential conflict of interest to both mitigate local impacts and also keep costs down. Both Local Government respondents and wider energy organisations agreed that the Regulator and assessment process should be separate from the NSL and DCO process.
89. The issue of State aid was also raised by respondents with developers noting that the State aid position would need to be clarified as elements of the RAB model will need to be confirmed quickly to allow State aid notification to commence. The law firm respondent also noted the need for the RAB model's State aid position to be resolved quickly as the investors would not be able to manage this risk.

Next Steps

98. Nuclear power has long played an important role in UK power generation and will continue to do so as we pursue new large-scale nuclear plants. Nuclear offers firm, low carbon power and, provided it can be delivered to time and budget, generates a value-for-money, proven source of reliable low carbon power to complement renewables.
99. The government will aim to bring at least one large-scale nuclear project to a Final Investment Decision (FID) by the end of this parliament, subject to clear value for money for both consumers and taxpayers and all relevant approvals.
100. Having assessed the consultation responses, including the broad agreement from industry and those members of the public who were not in-principle opposed to nuclear to our proposals, we believe that a RAB in line with the high-level design principles set out in the consultation remains a credible basis for financing large-scale nuclear projects.
101. In particular, it is clear that if any model is to attract private financing it will likely require:
- A variable £/MWh price allowing for the revenue stream to be adjusted by the Regulator as circumstances change.
 - An Allowed Revenue during construction to reduce the scale and cost of financing, increasing deliverability and reducing total cost to suppliers and consumers.
 - Some level of risk sharing between investors and consumers / taxpayers.
102. Following the consultation, Government will continue to explore a range of financing options with developers, including RAB. As noted in the consultation, raising the capital required for a new nuclear project is likely to be challenging given the significant investment commitment needed for a new nuclear project developer to reach a FID. Alongside considering the RAB model we will also continue to consider the potential role of government finance during construction, aligning with suggestions from some of the consultation responses, provided that there is clear value for money for consumers and taxpayers and subject to all relevant approvals.
103. Some respondents stated that in order to provide more granular feedback the Government should provide more details on the specific design of the RAB model. However, the stated purpose of the consultation was to seek views on the high-level design principles of a RAB model. We consider that the level of information provided was appropriate for this stage of the process. Further details will be developed in discussion with developers of specific projects.

Annex 1: Glossary

| Defined Term | Definition |
|-----------------|--|
| Allowed Revenue | A regulated revenue amount (in £) which the project company would be entitled to receive under its economic licence in return for constructing and operating a nuclear power plant. |
| Baseline | The baseline project capex costs set for the purposes of establishing regulatory incentives under the ERR. |
| Capacity Market | A market-based mechanism that incentivises reliable generating capacity to be available to ensure security of electricity supply. |
| Capex | Capital Expenditure. |
| CCUS | Carbon Capture, Usage and Storage. |
| CfD | Contract for Difference. |
| CGN | China General Nuclear Power Group. |
| Consumers | The consumers in the UK who receive electricity from energy suppliers. |
| Cost of capital | Cost of finance, being the return that investors (equity and debt) expect for providing capital to a company. |
| DCO | Development Consent Order. A statutory instrument granted by the Secretary of State to authorise the construction and development of a Nationally Significant Infrastructure Project, such as a new nuclear power plant. |
| Depreciation | The allocation of the cost of assets to periods in which the assets are used. |
| EDF | Électricité de France |
| ERR | Economic Regulatory Regime. This is the regime that would be put in place for economic regulation of the nuclear power plant. |
| EPR | A third-generation pressurised water nuclear reactor. |
| FDP | Funded Decommissioning Programme. A programme which makes financial provision for the costs of decommissioning, waste management and disposal associated with a new nuclear project. |
| Funding Cap | A threshold capital expenditure amount, set at a level such that there was only a remote chance of construction costs reaching this level. |
| GDA | Generic Design Assessment. An assessment process that allows the Environment Agency and Office for Nuclear Regulation to scrutinise new nuclear power stations before they are built. |
| GSP | Government Support Package. |
| Horizon | Horizon Nuclear Power. A UK nuclear energy company and a subsidiary of Hitachi Ltd. |
| HPC | Hinkley Point C nuclear power plant currently under construction in Somerset. |
| MW | Megawatt (1,000,000 Watts). |
| MWh | A MW of electricity used for an hour. |

| Defined Term | Definition |
|----------------------------------|---|
| NAO | The National Audit Office. |
| Negative emissions technology | Technology that removes emissions, such as Biomass carbon capture and storage. |
| Net Zero | The commitment by the Government to legislate to reduce greenhouse gas emissions to net (i.e. including the use of negative emissions technology) zero by 2050. |
| NSL | Nuclear Site Licence |
| Nuclear Sector Deal | A Sector Deal set-up between the Government and the nuclear industry, published in 2018 as part of the Industrial Strategy. |
| Ofgem | The Office of Gas and Electricity Markets. The regulator for gas and electricity markets in the UK. |
| Ofgem's Targeted Charging Review | Ofgem review into the way in which costs of the network used to transport electricity to homes, public organisations and businesses are recovered. |
| ONR | The Office for Nuclear Regulation. The safety regulator for the nuclear industry in the UK. |
| RAB | Regulated Asset Base. The total cumulative capital expenditure as incurred and approved as being efficient by the Regulator. |
| RAB model | A type of economic regulation typically used in the UK for monopoly infrastructure assets such as water, gas and electricity networks, the application of which to nuclear power plants is considered in this consultation. |
| Revenue Stream | A route for funds to be raised from energy suppliers (and indirectly their consumers) to support new nuclear projects, with the amount set through the ERR, during both the construction and operational phases. |
| Regulator | The economic regulator of a project company under a RAB model. |
| RIIO-1 | Revenue + Incentives + Innovation + Outputs. The network price controls set by Ofgem. |
| TTT | Thames Tideway Tunnel project |
| WACC | Weighted Average Cost of Capital |
| Wholesale Market | The UK wholesale electricity market, where electricity is traded between suppliers, generators, traders and customers. |
| Wylfa Project | The proposed new nuclear power plant at Wylfa Newydd, in Anglesey, North Wales. |

Annex 2: List of organisations that responded to our consultation exercise

| Organisation | Category | |
|------------------------------------|------------------------------|----------------------------|
| CGN | Developers | |
| EDF Energy | | |
| EDF S.A | | |
| Horizon | | |
| KEPCO | | |
| Westinghouse | | |
| Assystem | | |
| Balfour Beatty | Nuclear Sector Organisations | |
| Cavendish Nuclear | | |
| Guardian Power | | |
| Jacobs | | |
| Laing O'Rourke | | |
| NIA | | |
| Mott MacDonald | | |
| National Skills Academy Nuclear | | |
| NuScale Power | | |
| Rolls-Royce | | |
| TÜV SÜD Nuclear Technologies | | |
| Urenco | | |
| Wood Nuclear | | |
| World Nuclear Association | | |
| Atlantic Energy | | Wider Energy Organisations |
| British Hydropower Association | | |
| Drax | | |
| Elexon | | |
| Energy Intensive Users Group | | |
| Energy Systems Catapult | | |
| Energy UK | | |
| Innogy Renewables | | |
| LCCC | | |
| Offshore Renewable Energy Catapult | | |
| Regen | | |
| RenewableUK | | |
| Uniper | | |
| Bristol Energy | Suppliers | |
| Bulb | | |
| Centrica | | |
| Ecotricity | | |
| e-Power | | |
| National Grid | | |
| RWE | | |
| Scottish Power | | |

| Organisation | Category | |
|--|----------------------------|--|
| Shell | | |
| SSE | | |
| Citizens Advice | | |
| Citizens Advice Scotland | Consumer groups | |
| Friends of the Earth Nuclear Network | Environmental Groups/NGOs | |
| Greenpeace | | |
| Nuclear Free Local Authorities Secretariat | | |
| Pembrokeshire Friends of the Earth | | |
| Radiation Free Lakeland | | |
| RSPB | | |
| West Cumbria Friends of the Earth | | |
| People Against Wylfa B | | |
| BANNG | | |
| Suffolk Alternative Green Environment | | |
| Suffolk Coastal Friends of the Earth | | |
| Theberton and Eastbridge Action Group on Sizewell | | |
| Together Against Sizewell C | | |
| Copeland Borough Council | | Local Communities/Other Government Bodies/ /Local Governments |
| Cumbria LEP, County Council and Partners | | |
| East Suffolk Council | | |
| Gwynedd Council | | |
| Heart of the South West Local Enterprise Partnership LEP | | |
| Isle of Anglesey County Council | | |
| Middleton cum Fordley Parish Council | | |
| New Nuclear Local Authorities Group | | |
| Oldbury on Severn Parish Council | | |
| Snowdonia Enterprise Zone Advisory Board | | |
| South Gloucestershire Council | | |
| Suffolk County Council | | |
| Theberton and Eastbridge Parish Council | | |
| Crown Commercial Service | Government-owned Companies | |
| Amber Infrastructure Group | Investors | |
| Aviva Investors | | |
| Dalmore Capital | | |
| DWPF | | |
| The Infrastructure Forum's RAB Working Group | | |
| IPFA | | |
| Macquarie Capital | | |
| OMERS | | |
| Pensions Infrastructure Platform | | |
| USS Investment Management | | |
| United States Government (impressions not formal response) | | Other Governments |
| Welsh Government | Other Trade Associations | |
| Chemical Industries Association | | |

| Organisation | Category | |
|---|-------------------------------------|-----------|
| Unite | Trade Unions | |
| GMB | | |
| Prospect | | |
| ONR | Regulators | |
| EA | | |
| Institution of Civil Engineers | Engineering Organisations | |
| Institution of Mechanical Engineers | | |
| UK Steel | | |
| Centre for Economics and Business Research | Universities/Research/Consultancies | |
| Energy Policy Research Group, Faculty of Economics, University of Cambridge | | |
| Grant Thornton | | |
| School of Civil Engineering, University of Leeds | | |
| Dalton Nuclear Institute, University of Manchester | | |
| Public Services International Research Unit - University of Greenwich | | |
| RJP Property Consultants | | |
| Sydney Howell - University of Manchester | | |
| Norton Rose | | Law Firms |

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