

ICE response to BEIS consultation on a Regulated Asset Base (RAB) model for new nuclear

October 2019

Executive summary

ICE's National Needs Assessment (NNA) in 2016 found that the UK's peak energy capacity would need to increase by 33% on current levels by 2050.¹ To meet this and the net zero carbon target, heavy and sustained investment in low carbon and renewable energy is needed alongside battery and storage technologies, smart grid solutions, and a more sustainable heating network. To support this, a stable regulatory environment and long-term policy objectives are required to bolster investor confidence.

Up to 20% of the UK's current power needs are already met by nuclear and, with 7 of the UK's existing 8 nuclear plants due to come offline by 2030, there is an urgent need for new nuclear capacity to maintain and enhance its contribution to the UK's future energy mix.

Recent developments have shown that nuclear projects are complex to finance and have long lead-in times, however ICE believes nuclear is required as part of a diverse energy mix to provide a stable level of long-term baseload power. We therefore welcome this consultation outlining the necessary regulatory and financial frameworks to enable the development of new nuclear power stations.

Beyond the costs of construction, the most important driver of nuclear cost reductions is to reduce the cost of capital. Due to their high capital costs and long construction times, new nuclear projects are especially sensitive to the cost of capital.

The RAB approach can substantially reduce the cost of capital and widen the potential pool of potential investors to include institutions such as pension funds. The RAB model has been successfully used for many years for the electricity and gas networks, the water sector and large airports. Recently a hybrid RAB model – with excess cost sharing and a cost cap – was used to secure low cost financing for the Thames Tideway Tunnel (TTT) project.²

¹ ICE (2016), [National Needs Assessment](#)

² Defra (2015), [Thames Tideway Tunnel: strategic and economic case, costs and benefits, 2015 update](#)

Key points

- The proposal for the RAB model is credible, but further work is now needed to develop the details of the mechanism for new nuclear projects. It will be vital to confirm and clarify important aspects including risk apportionment, construction cost overrun, time overrun, approvals and payment sequencing, particularly to ensure consumers are not unfairly burdened with risk.
- While there are some transferable lessons from TTT, including using a bidding process for determining the weighted average cost of capital (WACC), the differences between TTT and new build nuclear should not be underestimated, particularly as nuclear is of a significantly higher scale and complexity.
- A nuclear project under RAB will require close scrutiny and full transparency. The consultation recognises the important role of an economic regulator within the framework; we welcome this and consider that a body with effective capability would need to be appointed to both protect the interests of consumers and provide reassurance to investors, with Ofgem appearing the most suitable organisation.
- Government must consult thoroughly with potential investors to ensure that a framework is developed which does deliver the lower cost of capital which is central to a RAB approach. This needs to also provide confidence to investors that regulatory decisions are evidence-based and impartial.
- There must be a responsibility on the project proposer under a RAB model to have a mature design from the outset. Clearly not all risks will be known, but scope, design and exploration works should be completed before commencement of work is allowed, to mitigate the risk of scope creep or retroactive changes, taking steps to include contractors in design at an early stage.
- Consideration should be given to the type of model used in the delivery of new nuclear when awarding a RAB contract. Many infrastructure clients are taking steps to move away from a transactional arrangement to an enterprise model, with seven early adopters forming part of the Infrastructure Client Group's Project 13. This approach could deliver better outcomes on new nuclear projects, including more collaborative working, productivity improvements, better governance, data-led frameworks and earlier, strategic engagement of the supply chain.

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?

We welcome the core elements of the RAB model for nuclear as proposed in the consultation. These draw on previous approaches and provide the right starting point for developing a nuclear-specific approach.

The RAB model could provide a more efficient financing solution for new nuclear investment by providing greater risk-sharing on construction (and other risks) and an allowance for revenue during construction. This financing model could enable pension funds to privately finance new nuclear power and drive a significant cost of capital reduction to the benefit of the end user through reduced prices. A well-designed RAB framework will enable a much wider set of investors to support the project, decreasing the risks that are shared with consumers and taxpayers and ensuring strong incentives are placed on the developer and investors to control costs and to deliver on time.

While the proposal for the model is credible, further work is now needed to develop the details of the mechanism as it will apply to new nuclear projects and to confirm and clarify important specifics. This includes risk apportionment, construction cost overrun, approvals and payment sequencing, particularly to ensure consumers are not unfairly burdened with risk.. It will also be vital to consult carefully with potential investors to ensure that an investable framework is developed which does deliver the lower cost of capital which is central to a RAB approach.

ICE's paper earlier this year on reducing the gap between project forecasts and outturns in major infrastructure projects and programmes identified a number of recommendations to create healthier expectations and attitudes toward project management, whilst encouraging a narrative shift away from cost only procurement and success metrics. In terms of scoping, there must be a responsibility on the project proposer to have a mature design from the outset. Clearly not all risks will be known, but infrastructure owners should complete scope, design and exploration before commencement of work is allowed, to mitigate the risk of scope creep or retroactive changes, taking steps to include contractors in design at an early stage.³ This is particularly relevant to new nuclear, which is both high-risk and high-cost. Having this mature design in place is significant both to de-risking the construction and performance (post-commissioning) phases. Approaches exist which can ensure that the nuclear project secures its allowed revenues, power is sold in a competitive and transparent manner and all suppliers are treated equally with visibility on any cost exposures and timings.

Outside of RAB and financing models, consideration should also be given to the type of model used in the delivery of new nuclear. Many infrastructure clients are taking steps to move away from a transactional arrangement to an enterprise model, with seven early adopters forming part of the Infrastructure Client Group's Project 13.⁴

The underlying problems with current delivery models include, but are not restricted to, the following:

- Approaches to procurement that prioritise lowest capital cost over whole-life benefits;
- A contracting market whereby low margins are now commonplace as the largest contracting organisations race one another to the bottom on price to secure work;
- A highly transactional supply chain, which promotes adversarial behaviours and the poor allocation of project risks;
- Low levels of investment in innovation and skills development.

To overcome these problems ICE has been working with the Infrastructure Client Group (ICG) to develop new thinking around major project and programme delivery in the form of Project 13. This approach to infrastructure delivery seeks to transform current behaviors in relation to procurement, risk allocation, innovation and skills investment. On procurement value appraisal is considered in terms of whole life cost, plus the wider outcomes and benefits of a given project.

Specifically, the Project 13 business model could support better delivery of new nuclear projects under RAB in the following ways:

- Providing sufficient scope for efficiency, productivity and innovation, so that suppliers can invest in more productive methods of construction which will pay off across a larger programme.
- Long-term relationships with closer collaboration, allows suppliers and advisors to get to know their customer better and adapt and develop appropriate methods and products for their needs.
- Integration, by bringing together advisors and different levels of suppliers jointly to work with the owner the combined expertise can be used to develop and deploy innovation rather than introducing competition across contracts.

³ ICE (2019), [Reducing the gap between cost estimates and outturns for major infrastructure projects and programmes](#)

⁴ Infrastructure Client Group, [Project 13](#)

- Earlier, strategic engagement of the supply chain allows better joint scoping of potential application of innovative products and processes, therefore increasing the chance of successful and productive deployment.

Taken together, this approach can mitigate risk, rather than simply transfer it as under traditional contracting models. This is particularly important in application to the RAB model in order to reduce the amount of risk that consumers and government are exposed to. The principles of Project 13 are already being trialled by six early adopters in the UK, including Sellafield Ltd on its Programme and Project Partners (PPP) model in support of the site's 100-year decommissioning programme.⁵ The early adopters of Project 13 have committed to share their experiences and learning of the principles.

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

N/A

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?

A nuclear project under RAB will require close scrutiny and full transparency. The consultation recognises the important role of an economic regulator within the framework; we welcome this and consider that a body with effective capability would need to be appointed to both protect the interests of consumers and provide reassurance to investors, with Ofgem as an existing independent regulator with experience of RAB frameworks appearing the most suitable organisation.

Consumers under a RAB model receive little to no return in the time before a nuclear power station begins generation. There must therefore be answers to which party and what proportion the risk of overruns and delays belong to, with a recognition that consumers' return should be consistent with the risk they are taking. Further work is also required to prevent a situation where consumers pay for a project that was started, then later abandoned.

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?

N/A

⁵ Sellafield Ltd (2019), [Supply Chain Strategy 2019/20](#)

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?

The RAB model has been successfully used for many years in other infrastructure sectors, and lessons should be applied where appropriate to design a sustainable revenue stream. We welcome the consultation's commitment to make decisions on the model for new nuclear on a case-by-case basis. This could allow for a full assessment on costs and risk under a number of models, and which provides the greatest benefit to society.

There are good precedents to draw on from the CfD and Capacity Market models and we support that a 'one-size-fits-all' approach may not be suitable, with revenue arrangements potentially needing to be revisited on a project-by-project basis.

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?

It is clear that a diverse energy mix is required in the transition to net zero carbon, particularly as widening electrification of the economy is expected to be key in meeting those targets, with nuclear providing a reliable baseload power source.

However, with the fast decreasing costs of renewable power, most notably offshore wind, the role of renewables in terms of meeting generation needs, carbon reduction targets and delivering value for money is becoming ever more prominent. The cost of renewables has fallen faster than many predictions and are expected to continue to fall as efficiencies are found and technology develops further.

We support the use of a thorough and diligent value for money assessment approach in order to ascertain whether a new nuclear project should be granted a RAB licence and government support package. This should compare the project with that of other low-carbon alternatives, be they renewables, biomass or fossil fuels fitted with carbon capture technology. We welcome the proposal in the consultation for the assessment to include wider benefits outside of cost; ICE recommends that government and infrastructure owners must move away from capital cost as the most important metric when assessing project benefits, recognising the importance of whole-life economic, social and environmental value.⁶

The National Infrastructure Assessment identified that there is limited experience of using RAB for anything as complex and inherently risky as nuclear.⁷ Any assessment needs to be fully transparent and recognise the full costs and risks, and should not be distorted by hidden costs or used to present costs as artificially lower. Investors need to be mindful of this when promoting projects such as new nuclear that require broad public support.

The stability of the RAB model has recently been used to attract investment for 'new' projects, the prime example of which is the Thames Tideway Tunnel, which used a hybrid variant of RAB with excess cost sharing and a cost cap to reduce risk to deliver an adequately low weighted average cost of capital (WACC).⁸ This works differently from in the established utilities as there is no pre-existing asset base. This means the model requires expenditure to be added to the RAB as construction progresses. This expenditure is not subject to regulatory efficiency assessments in the same way, with the

⁶ ICE (2019), [Reducing the gap between cost estimates and outturns for major infrastructure projects and programmes](#)

⁷ NIC (2018), [National Infrastructure Assessment](#)

⁸ University of Cambridge (2019), [Financing low-carbon generation in the UK: The hybrid RAB model](#)

operator instead incentivised to keep costs low by comparing outturn costs with a target cost. In the example of TTT, the operator keeps 30% of any outperformance of the target, but is accountable for 40% of any overspend.⁹

The debt equity cost was also reinforced through governmental support.¹⁰ The project's guarantees are indexed to inflation, guarantees of cash flow last for 15 years, enabling institutional investors to offer reduced-cost investment at a target of 2.497%, and £700m was secured through a 35-year loan from the European Investment Bank. The 2.497% weighted average cost of capital is lower than indicative estimate of 3.29% and below the 3.6% WACC from Ofwat's final determination for the PR14 price control period for water and sewerage companies.^{11 12}

Unlike traditional regulatory determinations, where the regulator sets a cost of capital, the TTT WACC was reached through a bidding process. This approach should be considered in regulatory determinations for new nuclear.

However, the differences between TTT and new build nuclear should not be underestimated, especially given the significantly higher scale and complexity associated with the delivery of new build nuclear projects.

About ICE

Established in 1818 and with over 93,000 members worldwide, the Institution of Civil Engineers exists to deliver insights on infrastructure for societal benefit, using the professional engineering knowledge of our global membership.

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⁹ National Audit Office (2017), [Review of the Thames Tideway Tunnel](#)

¹⁰ ICE (2018), [State of the Nation 2018: Infrastructure Investment](#)

¹¹ Ofwat (2014), [Consultation on the regulatory framework for the infrastructure provider that will deliver the Thames Tideway Tunnel Project](#)

¹² Ofwat (2014), [Setting price controls for 2015-20, final price control determination notice](#)