ofgem
Making a positive difference
for energy consumers

Draft Impact Assessment

Impact Assessment on developing arrangements to allow for early competition to be applied to future projects on the onshore electricity transmission network			
Division:	Networks	**Type of measure:**	Competition in electricity transmission networks
Associated documents:	Consultation on our views on early competition in onshore electricity transmission networks	**Type of IA:**	Qualified under Section 5A Utilities Act 2000
Coverage:	Full		

Summary:

This document is a draft Impact Assessment (IA) that sets out our assessment of whether the benefits to consumers and other parties of continuing the development of early competition with the Electricity System Operator (ESO) is likely to be greater than the costs associated with its continued development.

What is the problem under consideration? Why is Ofgem intervention necessary?

Ofgem's principal objective is to protect the interests of existing and future consumers in relation to gas conveyed through pipes and electricity conveyed by distribution or transmission systems. As part of achieving these objectives, Ofgem seeks to ensure that new large electricity and gas network projects that are needed are delivered as efficiently as possible. Since 2009 we have successfully applied competition to significantly reduce the costs of offshore electricity transmission. Since 2015, we have been developing policies and frameworks to introduce competition, or seeking to replicate competition, in the delivery of new, separable and high value onshore electricity transmission projects. Within our recent work on the RIIO-2 price controls we have also sought to develop early competition. Early competition refers to a competition, to determine a solution to a need on the network, that is run before detailed design of the preferred solution has been carried out. In our May 2019 RIIO-2 Sector Specific Methodology Decision (**SSMD**), we requested that the Electricity System Operator (**ESO**) work on a plan for early competition alongside its RIIO-2 Business Plan.

In April 2021 the ESO published its final Early Competition Plan (**ECP**). This Impact Assessment (**IA**) accompanies our consultation on our views on early competition in onshore electricity transmission networks. That consultation summarises our views on early competition, including the ECP's findings. Within the ECP, the ESO identifies an estimated one-off upfront cost of £5.3m - £6.9m[1] is needed to appropriately develop the early competition proposed within the ECP before any tender could be run. This IA considers whether these one-off development costs are likely to be in the interest of consumers. It does this by comparing these development costs and an estimation of running early competition tenders, with the potential benefits in terms of consumer savings that early competition could bring.

This IA is not intending to reach any conclusions on the relative merits of early competition versus alternative approaches (RIIO or models of late competition). Instead, this IA is focused solely on whether the costs associated with developing the regulatory and commercial arrangements proposed by the ESO to allow for early competition in future are likely to be in the interest of consumers.

[1] Section 8.3, pg 160 of the ECP: https://www.nationalgrideso.com/document/191251/download

As explained in Chapter 4 of the accompanying consultation, under the proposed early competition arrangements within the ECP, a Cost Benefit Analysis (CBA) would be run for every potential network solution that is considered suitable for early competition.[2] This CBA process would ultimately determine which types of network intervention are most suited to early competition and deliver the greatest level of consumer benefit. The project-specific CBA would fully consider the relative merits of early competition versus late competition and the status quo TO delivery under RIIO for each project.

What are the policy objectives and intended effects including the effect on Ofgem's Strategic Outcomes

The ultimate objective of extending competition in the delivery of electricity network investment is to apply additional competitive pressure on necessary investment in order to lower consumer bills. Early competition specifically allows for competition to be applied to the design, as well as the delivery of electricity network investment. Where targeted at the right projects, this should allow for a wider range of innovative solutions to drive additional savings and also help the energy system better achieve decarbonisation targets and encourage new innovation.

What are the policy options that have been considered, including any alternatives to regulation?

Option 1: The preferred option - developing the regulatory arrangements to allow for early competition to be applied to the design, construction and operation of eligible electricity transmission network projects during the RIIO-2 period and future RIIO price control periods. Under Option 1 we consider an indicative early competition model, based on the arrangements set out in the ESO's Early Competition Plan (**ECP**).[3]

Option 2: in the event that option 1 is not implemented, Option 2 represents the continuation of the 'status quo' arrangements for the delivery of electricity transmission network projects. The incumbent network licensees would design, construct and operate the projects within their respective regions and this would be regulated under the status

[2] Via the early competition criteria described in Chapter 4 of the accompanying consultation
[3] https://www.nationalgrideso.com/document/191251/download

quo RIIO arrangements. Ofgem may alternatively decide, before construction begins, to apply a late model of competition to the project in question. This represents the 'status quo' or 'do nothing' option and would either involve the incumbent licensees receiving revenue for delivering the entire project in line with the prevailing price control arrangements, or revenue for the project being split between the incumbent licensee (pre-construction period) and a competitively appointed party (construction and operations period). Under the counterfactual it is assumed that non-network solutions continue to be able to compete in the ESO's Pathfinder processes as they do currently.

Preferred option - Monetised Impacts

Business Impact Target Qualifying Provision	Non-qualifying (competition)
Business Impact Target (EANDCB[4])	Not relevant
Net Benefit to GB Consumer	See below
Wider Benefits/Costs for Society	N/A

Our analysis is based on an estimation of the monetised benefits of early competition and the estimated one-off development costs of setting up the early competition arrangements as proposed in the ESO's ECP. Our analysis indicates that:

- it will take a very limited level of investment being subject to early competition before the expected benefits that early competition can deliver are likely to comfortably exceed the estimated development costs of £5.3m - £6.9m;
- even at the higher end of the cost estimate for setting up and running early competitions, as long as early competition is applied to £100m in capital expenditure (capex) across at least four tender processes, the level of consumer benefit delivered will comfortably exceed the ESO estimate; and
- if no projects progress through early competition, the consumer detriment would be in line with the one-off implementation costs of £5.3m - £6.9m.

[4] Equivalent Annual Net Cost to Business

Our qualitative assessment of benefits highlights the potential, where early competition is targeted at the design and delivery of suitable projects, for consumer savings to be made that far exceed these one-off implementation costs. We have observed significant cost savings from comparable early competitions for electricity transmission projects in North America. Our review of these North American projects, specifically the Hartburg-Sabine Junction and Duff-Coleman projects undertaken by the Midcontinent ISO, suggests a range of savings is possible from 22% to 42% relative to the initial indicative design.

For the purposes of taking a conservative estimate of the likely benefits to ensure the robustness of this IA, we consider that the bottom end of the range, 22% represents a suitable figure to use in our analysis. We consider that such a savings figure is realistic. This is because, as set out earlier, the policy intention is that early competition would only be applied to suitable projects identified following a CBA. This should allow early competition to be targeted where it can provide a wider range of innovative solutions to drive savings.

A 22% saving across £100m of capex investment would represent a saving of £22m. Even if the £100m of investment was spread across four tender processes, with no other early competitions ever being run, this benefit would almost certainly make the cost of developing the early competition model worthwhile. Given the level of investment needed to reach the GB Net Zero targets, there is likely to be a significant number of projects suitable for early competition that on their own are significantly higher value than £100m, with some prospective projects likely to be greater than £1bn in value.

Overall, we consider that given the potential pipeline of projects that might meet the criteria for early competition and that might be considered suitable following a CBA, the potential savings from implementing option 1 are likely to far exceed the estimated development costs.

Key Assumptions/sensitivities/risks

Chapter 2 sets out the assumptions used in our modelling for this IA.

Preferred option - Hard to Monetise Impacts

Chapters 3 and 4 of this IA set out in more detail the costs and benefits of introducing early competition in the design, construction and operation of electricity transmission network projects. Chapter 6 sets out the distributional effects.

Will the policy be reviewed?	**If applicable, set review date:**
no	N/A

Is this proposal in scope of the Public Sector Equality Duty?	No

Summary table for all options

Summary of options	Main effects on Consumer outcomes	Key considerations
Option 1: introducing early competition in the design, construction and operation of onshore electricity transmission network projects that are suitable during the RIIO-ET2 period and future price control periods.	We consider that the potential savings would be higher than the costs, even when additional potential interface costs are added (for the purposes of running a sensitivity – explained in Chapter 4).	We need to further develop the early competition model, alongside continuing to work with the ESO. Furthermore, we need to further assess the pipeline of future possible projects, and ultimately make decisions on whether specific projects are suitable for early model competition.
Option 2: 'status quo' arrangements.	No change to outcomes.	This option represents the counterfactual of delivery through the prevailing price control by the relevant incumbent network licensee, or revenue for the project being split between the incumbent licensee (pre-construction

Summary of options	Main effects on Consumer outcomes	Key considerations
		period) and a competitively appointed party (construction and operations period). Under the counterfactual it is assumed that non-network solutions continue to be able to compete in the ESO's Pathfinder processes as they do currently.

1. Introduction

1.1. Since 2009 we have successfully applied competition to significantly reduce the costs of offshore electricity transmission.[5] In our RIIO-2 Framework Consultation in 2018[6] we stated our ambition of developing a range of models for competition for onshore networks, ranging from late models through to early models for ideas or solutions to solve network issues. We further progressed our thinking and in our RIIO-2 Sector Specific Methodology Decision in 2019 we made the decision to require the Electricity System Operator to consider how early competitions could be run in the electricity transmission sector and produce an Early Competition Plan to this effect.

1.2. This IA considers the benefits and costs to consumers of developing a model of early competition that is suitable for allowing early competition to be considered for future projects in onshore electricity transmission networks. It considers early competition being applied to projects during the RIIO-2 period and future price control periods (option 1 on page 2). Option 1 is compared against a counterfactual of delivery through the prevailing price control by the relevant incumbent network licensee, or revenue for the project being split between the incumbent licensee (pre-construction period) and a competitively appointed party (construction and operations period) (option 2 on page 3).

1.3. This IA focuses on whether there is justification for finalising development of early model competition to allow its introduction to projects in electricity transmission during the RIIO-2 period and future price control periods. It does this based on estimated costs for finalising development of early model competition and the expected costs of running a competition. These costs represent the 'break even' point against which we consider whether it would be beneficial to introduce the ESO's proposed model of early competition. This IA then compares those costs against the expected potential benefits observed from competitions to consider whether the benefits of introducing competition are likely to be greater than the costs.

[5] https://www.ofgem.gov.uk/publications-and-updates/evaluation-ofto-tender-round-2-and-3-benefits
[6] https://www.ofgem.gov.uk/publications/riio-2-framework-consultation

1.4. This IA has been published alongside our consultation on our views on the development of early competition, available on our website.[7]

Overview of the competition models considered in this document

1.5. This IA considers the model of early competition proposed by the ESO in its Early Competition Plan.

Structure of this document

1.6. This document covers the following:

- Chapter 2 sets out our assumptions used in this analysis.
- Chapter 3 considers the benefits of applying an early competition model to suitable projects in electricity transmission networks during the RIIO-2 period and future price control periods.
- Chapter 4 considers the costs of continuing to develop and apply an early competition model to suitable projects in electricity transmission networks during the RIIO-2 period and future price control periods.
- Chapter 5 sets out our overall cost benefit assessment of continuing to develop an early competition model.
- Chapter 6 considers the distributional effects of introducing early competition in the delivery of solutions to electricity transmission network system needs.

[7] https://www.ofgem.gov.uk/publications/consultation-our-views-early-competition-onshore-electricity-transmission-networks

2. Assumptions used in this analysis

2.1. This chapter sets out the underlying assumptions within our analysis of the potential impact of developing and introducing an early competition model (option 1) instead of the status quo approach (option 2).

2.2. In the following sections we have set out:

- An overview of our general modelling approach for this IA; and
- Different project scenarios we have used in our modelling.

General modelling assumptions

2.3. The uncertainties around the specific details of an early competition model and the exact costs and benefits potentially achievable by a range of solution types mean that we do not consider that it is possible or appropriate to arrive at a single monetary estimate of the impact of developing and introducing early competition in electricity transmission networks.

2.4. Instead, we have identified the estimated one-off cost associated with developing a finalised model of early competition in line with the arrangements proposed in the ESO's ECP. We have then estimated the costs associated with running early competition tenders. We have then looked at the overall cost of developing the model plus the cost of running various combinations of tenders for network investments of various capex value. This is in order to determine the value of investment that would need to be subject to early competition for us to be confident that benefits to consumers would exceed costs.

2.5. Our analysis recognises that the level of investment likely to be subject to early competition could range from less than £100m up to several billion pounds. We have based our cost estimates on those costs identified by the ESO for finalising development of the early competition model, and the cost assumptions for running tenders set out in our RIIO-ED2 IA on competition.[8] At this point in time, aside from the specific cost estimates referenced from the ESO, the cost estimates used in this IA are purely indicative.

[8] https://www.ofgem.gov.uk/sites/default/files/docs/2020/08/ed2_ssmc_late_competition_ia_0.pdf

Project scenario modelling

Base project profiles

2.6. Our analysis has used project scenarios to test the point at which the level of benefit that early competition can deliver will exceed the one-off upfront cost of developing the early competition model in line with the ESO's ECP. To do this we have looked at projects of different capex values as summarised in Table 1. This is to reflect the wide range of projects that may be subject to early competition, including projects that are smaller in scale and fall below the £100m capex value threshold used for late competition.

Table 1 – Project profiles

Project:	a	b	C	d	E	F
Capex value:	£20m	£25m	£50m	£100m	£250m	£1bn

Pipeline scenarios

2.7. We have used the project profiles above to generate a set of pipeline scenarios that could occur. We have selected a range of scenarios that thoroughly test our proposals and that we consider provide a realistic minimum range of outcomes for projects that could be subject to competition in electricity transmission networks during RIIO-ET2 and future price controls. These scenarios are set out in Table 2 and are designed to determine the level of investment that would need to go through early competition in order to ensure that the benefits for consumers exceeed the initial one-off development costs and ongoing costs of running tenders.

Table 2 – Modelled pipeline scenarios

Scenario → / Number of projects ↓	a	b	c	d	e	f
1	1x £20m indicative solution	1x £25m indicative solution	1x £50m indicative solution	1x £100m indicative solution	1x £250m indicative solution	1x £1bn indicative solution
2	2x £20m indicative solution	2x £25m indicative solution	2x £50m indicative solution	2x £100m indicative solution	2x £250m indicative solution	2x £1bn indicative solution
3	3x £20m indicative solution	3x £25m indicative solution	3x £50m indicative solution	3x £100m indicative solution	3x £250m indicative solution	3x £1bn indicative solution
4	4x £20m indicative solution	4x £25m indicative solution	4x £50m indicative solution	4x £100m indicative solution	4x £250m indicative solution	4x £1bn indicative solution
Cost of running tender assumption:	High end of range	High end of range	High end of range	High end of range	High end of range	High end of range
One-off development costs	High end of range	High end of range	High end of range	High end of range	High end of range	High end of range

2.8. The cost assumptions element of each scenario is discussed later in Chapter 4 of this IA.

Cost calculation method

Total costs

2.9. In each scenario, we have calculated each cost element in net present value terms (2021 prices) and totalled them.

- For Ofgem and network licensee tender costs and bidder costs, the cost was calculated from a percentage of the capital value of the projects in each scenario. These costs are assumed as constant and profiled equally along expected timelines. These were discounted at a rate of 3.5% to give their present value, of which a percentage was calculated. In practice we would expect there may be economies of scale that would mean costs could be lower than this; however, we have applied a conservative (high cost) assumption at this stage.

- For costs that are expressed as fixed monetary values in our assumptions, these costs are assumed as constant and profiled equally along expected

timelines. They are then converted into net present value using a discount rate of 3.5%.

Costs as a percentage of asset value

2.10. The total costs in a scenario, in net present value terms (2021 prices) are expressed as a percentage of the value of all the projects in a scenario, also in present value terms.

3. Benefits of applying an early competition model to suitable projects in electricity transmission networks

Introduction

3.1. This chapter sets out the benefits of applying early competition to future projects in electricity transmission networks during the RIIO-ET2 period and future price control periods. Our views on the benefits are informed by our experiences of introducing late competition models in offshore electricity transmission (OFTO), developing late competition models for onshore electricity tranmission and knowledge of comparable competitive regimes in different countries and across other sectors, including where early model competitions have been used in North America.

3.2. It is complex to quantify and monetise the efficiency and dynamic benefits of opening markets to competition, such as the scope of increased innovation and the introduction of new products, services and technologies. However, we are able to draw on significant quantitative assessments of recent developments on the GB network, and comparable competitive regimes internationally. Our experience with the OFTO and Interconnector Cap and Floor regimes shows that new entrants into the domestic transmission sector can bring new approaches to contracting and operational approaches and can drive significant savings for consumers. The growth of Independent Distribution Network Operators (**IDNOs**) and Independent Connection Providers (**ICPs**) in the distribution connection market shows that there is appetite for a range of parties to compete for work on the electricity network at a range of different values. Evidence from the Network Innovation Competition (**NIC**) and Network Innovation Allowance (**NIA**) during the RIIO-1 price controls demonstrates that there are a range of innovations on the transmission and distribution networks that are under development, and will continue to be developed to unlock additional benefits to consumers. Importantly, evidence from international markets, such as in parts of North America, show that all of these aspects can be combined in the electricity sector to deliver significant savings to consumers.

General benefits of competition

3.3. Effective early competitions can allow new and efficient solution types to solve issues arising from network constraints, including novel non-network solutions. This can result in lower costs and better value for consumers as bidders seek to create innovative and cost-saving solutions in order to submit competitive bids. It can also have wider benefits, as

innovations adopted by one party may be relevant for the rest of the industry and could help drive down wider costs, leading to benefits for consumers.

3.4. By encouraging innovation around the type of solution proposed, early competitions can facilitate non-network solutions that may prove to offer a number of advantages over traditional network assets. This could include solutions that require significantly less cost and/or time to implement or deliver, allow for greater flexibility in accommodating future demand on the system, or produce additional benefits such as increased network security or stability.

3.5. While less of a focus in early models of competition when compared to late models, effective competition can enable efficient delivery costs to be revealed. Within some set parameters of project scope and regulation, the pressure of competition encourages parties to reveal the true cost of constructing and operating a project. Parties competing to be appointed are likely to put forward costs that are closer to the efficiency frontier than an incumbent constructing and operating a particular asset under a traditional price control approach, where this overall competitive pressure (ie the pressure associated with seeking the overall right to deliver the project) is not at play. Cost discovery should also improve over successive competitions, as bidders gain experience, allowing them to price more competitively. Specifically, relative to late competition, we consider that early competition can improve bidders' understanding of how the planning process can impact on design and cost assumptions. This can lead to increasing efficiency in bids over time, which could reduce costs to consumers.

3.6. The introduction of competition onshore may, over time, introduce downward pressure on the capital and operational costs elsewhere on the onshore network, where competition is not applied. It allows for the comparison of proposed capital and operational costs under RIIO price controls, with those that had been achieved through competition. Where applicable this information can be used to benchmark RIIO price control allowances using the evidence from onshore competition.

Innovation

3.7. Early competition can help to generate a wide range of ideas for solutions to system needs, and these may bring net benefits for consumers. For these competitions to be as effective as possible they should be open to as many potential solution types as possible, including both network and non-network options. By basing a competion around an identified and known system need, with careful use of reference designs and technology-

agnostic assessment criteria, the range of potential solutions is maximised and the likelihood of innovative, efficient and economic solutions being identified increases.

3.8. Further, the early competition model being developed uses a commercial model that does not rely on winning bidders to be incumbent TOs with significant portfolios of assets that are paid through complicated arrangements in the price controls. An early competition winner may only ever own a single asset. For this reason bidders will compete on an equitable basis for a Tender Revenue Stream (TRS) that does not prejudice against particular entities or entity types. This allows for the greatest potential for innovative ideas to win competitions and be implemented, which can ultimately lead to lower bills for consumers.

Non-network solutions

3.9. As a result of the positive pressure on innovation, early competitions naturally broaden the network to allow for non-network solutions to be implemented on the network. As well as reduced costs to consumers, non-network solutions can bring additional benefits to the network. For example, a software or control systems solution that offsets the need for a traditional transmission asset may increase network security as there is no physical asset to breakdown or malfunction, or increase network safety as there is no risk of physical malfunction.

3.10. Further, traditional transmission assets typically represent discrete and unscalabale investments and associated network benefits (eg a transmission cable of defined capacity and given cost) whereas non-network solutions may offer greater flexibility or scalability against uncertain future system requirements (eg cumulative incremental improvements to existing network assets), similar to the benefits of flexibility services, albeit on a larger scale.

Offshore electricity transmission experience

3.11. We have seen the savings that late competition can bring to the operation and financing of offshore electricity transmission infrastructure. The first three tender rounds of the OFTO regime are estimated to have saved consumers in the region of £700m - £1.3bn

to date on an NPV basis over 20 years.[9] We expect to publish the details of further savings from later rounds of OFTO tenders in the future.

Other sectors / countries

3.12. In North America, the Federal Energy Regulatory Commission requires that there be competition for new transmission assets at a regional level to drive innovative and cost-effective solutions. Individual Regional Transmission Operators (RTOs) have developed their own models of early competition, and thus a variety exist to consider. One RTO, PJM, used a very early, two stage model on the Artificial Island project (where the different solutions were assessed on different criteria at two bidding rounds). The New York ISO used a very early, one stage model on the Western New York Public Policy Transmission Need. The Alberta Electric System Operator used an early, one stage model on the Fort McMurray West Transmission Line where bidders were asked to innovate against a reference design solution. The proposer of the selected solution also gained the right to build, finance, own, operate and maintain the asset(s). The Midcontinent ISO used a similar model as the Alberta Electricity System Operator, which most closely aligns with the early competition model being developed by the ESO and Ofgem, on the Hartburg-Sabine Junction 500 kV Competitive Transmission Project. Our review of the most comparable North American projects, specifically the Hartburg-Sabine Junction[10] and Duff-Coleman[11] projects undertaken by the Midcontinent ISO, suggests a range of savings is possible between 22-42% on the indicative cost of an initial reference design. This demonstrates that there is scope for third parties to innovate around the initial assumed design of transmission projects.

[9] https://www.ofgem.gov.uk/publications-and-updates/evaluation-ofto-tender-round-2-and-3-benefits
[10] https://cdn.misoenergy.org/Hartburg-Sabine%20Junction%20500%20kV%20Selection%20Report296754.pdf
[11] https://cdn.misoenergy.org/Duff-Coleman%20EHV%20345kv%20Selection%20Report82339.pdf

4. Costs of continuing to develop and apply an early competition model to suitable projects in electricity transmission networks

Introduction

4.1. As the early competition model described in this document represents a movement away from the current RIIO arrangements, there will be implementation costs and risks associated with it. Additionally, although the ESO have published their final Early Competition Plan, there is still further work to be done before a finalised early competition model is ready to implement. This Chapter explores what costs and risks we expect could arise from continuing to develop the early competition model and its eventual implementation.

4.2. The costs identified in this Chapter have largely come from ESO estimates included in the ECP. We have supplemented them with assumptions around the costs of running tenders. The basis for these costs are set out below. The risks covered in this Chapter are based on our work to date developing various competition models, as well as through discussions with the ESO following the publication of their Early Competition Plan. We have direct experience with developing the OFTO regime and our Extending Competition in Transmission (**ECIT**) project.[12] We have only considered costs that are additional to costs incurred in the counterfactual.

Costs of continuing to develop and implement an early competition model

4.3. For this stage of early competition model development, as part of their Early Competition Plan the ESO has identified the likely costs that could realistically eventuate from finalising the development and implementation of the early competition model as between £5.3m to £6.9m.[13] We believe this is likely to be an accurate projection based on the information currently available.

[12] https://www.ofgem.gov.uk/energy-policy-and-regulation/engagement/forums-and-working-groups/extending-competition-transmission-industry-group
[13] Prices in 2021 prices, assumed to be spent in 2021/22 and 2022/23.

Costs of running tenders

4.4. The ESO has also provided cost estimates for the running of early competition tenders within its ECP. Section 8.3 of the ECP explains how the ESO has developed these cost estimates. In summary, the ESO has taken evidence from the Ofgem tender costs associated with the first three tender rounds of the OFTO process. It has cross-checked the resulting value, 1% of project value, against our subsequent consideration of the comparable values likely for late competition and against the methodology proposed by Ofwat for its Direct Procurement for Customers (DPC) model. The ESO has increased the range to 1%-1.5% of project value based on the additional complexity it expects will be associated with early competition relative to late competition, the OFTO regime and Ofwat's DPC.

4.5. Again, the ESO has identified the costs associated with regulatory oversight, referred to as the "Approver" within its ECP, from Ofgem and Ofwat published information relating to the development of late competition in electricity transmission, and Ofwat's DPC. It has also estimated additional costs associated with its proposed additional functions within the network planning process for an early competition tender. This leads to an overall cost estimate of 1.6% - 2.3% of project value. This includes the 1%-1.5% range referenced in paragraph 4.4.

4.6. Having reviewed available evidence from a European Investment Bank (EIB) report on Public Private Partnerships (PPPs), the ESO concluded that of this range, there is likely to be a significant element of fixed costs within the running of tenders. Using the available evidence, the ESO has estimated that, assuming that the range of 1.6% - 2.3% is most appropriate for a project valued at £250m. The evidence from reviewing smaller PPPs suggests that up to 50% of tender costs on a smaller project are likely to be fixed. The ESO therefore assumes that for early competition, the cost of running a tender will range from £2m fixed costs plus 0.8% of project value to £2.88m plus 1.2% of project value.

4.7. Therefore, as shown in Table 4, this IA assumes that in the "low cost" scenario, the fixed cost of running a tender will be £2m and the variable cost will be 0.8% of the project's value.

4.8. As also shown in Table 4, this IA assumes that in the "high cost" scenario, the fixed cost of running a tender will be £2.88m plus 1.2% of the project's value.

Successful bidder's costs of bidding

4.9. Bidders will incur costs when preparing bids, for example in engaging with the supply chain and undertaking due diligence. The successful bidder will also need to engage in the processes required ahead of taking over the project (such as further due diligence) in the preferred bidder stage. Under an early competition model, the winning bidder would recover those costs within its bid tender revenue stream. Costs to unsuccessful bidders would remain with them and would not be passed on. Based on our experience of the OFTO regime we estimate the absolute total costs to the successful bidder to be included in the tender revenue stream could rise to 2% of the capex of the project. For early competition, we recognise that, whilst there will be some offsetting of costs by equivalent costs under the RIIO counterfactual, the additional complexity of early competition bids relative to the OFTO regime mean that the equivalent costs could be marginally higher for these projects.

4.10. We therefore estimate that the additional costs for successful bidders associated with early competition could be as high as:

- 2% of project capex at the low end; and
- 3% of project capex at the high end.

4.11. We would expect successful bidder costs to fall below this 3% figure. We consider this is a conservatively high estimate, particularly for larger projects. Whilst the bidder costs are likely to increase with the value and complexity of the project, it is likely that there will be a significant fixed cost element to bidding and scope for economies of scale to reduce this figure. However, in the context of this specific IA, we consider it appropriate to test the benefit case against a realistic worst case estimate of the potential costs of running the competitions. This is in line with the approach we have taken previously for RIIO-2 IAs and therefore also allows for comparability across models.

Table 4 – Summary of the additional competition model costs

	Low cost	High cost
One-off set up costs (£m)	5.3	6.9
Fixed tender costs (£m)	2	2.88
Variable tender costs (% of project value)	0.80%	1.20%
Successful bidder costs (% of project value)	2%	3%
Total cost per tender (excl. one-off costs)	£2m + 2.8% of project value	£2m + 4.3% of project value

4.12. Interface costs are incurred where network licensees interact with each other or other relevant parties to operate and maintain the network. Industry codes, standards and processes are already in place to manage interfaces between multiple parties. Although we have confidence in the effectiveness of these processes, given the potential complexity of implementing non-network solutions there could be some small increase in interface costs introduced with early competition.

4.13. Finally, we have considered potential costs to the supply chain of introducing early model competition. We have not included any such costs as stakeholder responses to our previous consultations on introducing competition models were mixed on this. On the one hand, some stakeholders suggested that the supply chain could incur additional costs due to the need to engage with more bidders and a lack of clear view on projects subject to competition. On the other hand, some stakeholders suggested that competition may increase the range of suppliers and that there would be a strong incentive for the suppliers to adopt more cost efficient practices.

Risk of project delays and non-delivery

4.14. For high value projects in general, delay or cancellations of a project could result in considerable costs. Depending on which entity is delivering the project, the network licensee or winning bidder may incur higher construction costs, or indeed sunk costs in the case of non-delivery, and this may lead to higher constraint costs that are passed onto consumers through the delay or abandonment of a project or where a new party is required to take over. Where the project is required for a generator to export power, they will lose generation revenue if the project is delayed beyond the contracted date and the generation project is ready. All parties, including the licensee, winning bidder and affected generators could incur increased financing costs where the risk profile of the project is perceived to increase.

4.15. Delay or non-delivery could occur for a number of reasons at different stages in a project's development depending on the nature of the project, independent of whether an early competition model is used. For example, there could be unforeseen ground conditions, planning consents may be delayed, associated generation projects may fall away or be delayed, or there may be major issues with contractors (eg insolvency) or other supply chain bottlenecks (eg lack of supply). These project-specific risks are inherent in the development of high-value projects and apply to both the status quo and the early competition model.

4.16. There are potentially new sources of delay or non-delivery risk due to the early competition model. These relate to activities pre-tender, during the tender, and post-tender.

- **Pre-tender**, there is the time taken to finalise the specific competition model specifications of the early competition model and associated documentation. There is also the time to develop any project-specific documentation.

- **During the tender**, there is the time taken to run the competition, and more specifically, the time that this takes relative to the counterfactual arrangements. There is also the risk that the tender is cancelled. The ECP proposes mitigating the risk of a cancelled tender by ensuring the commercial and regulatory terms of the competition are appropriate and acceptable to the market before the competition commences.

- **Post-tender**, there is the time taken for the competitively-appointed party to deliver the project compared to the status quo arrangements. There is also the risk that the competitively-appointed party does not deliver the project at all (eg if it walks away or becomes insolvent). The ECP proposes strong incentives on the competitively-appointed party to deliver on time. The ECP also proposes that the tender documentation and evaluation criteria require the appointment of a robust competitively-appointed party. Finally, as a contingency measure against non-delivery, the ECP proposes last resort mechanisms are in place.

4.17. Although there is a risk introduced with early competition for delay and potential non-delivery, we believe this is offset and negated in several ways. Firstly, the initial project-specific CBA proposed in the ECP would consider any impact of the competition itself on delivery timelines and constraint costs. This CBA is designed to ensure that early competition will only be used when there is deemed a reasonable chance of an innovative, solution to compete, when compared to the counterfactual of the TO delivering a solution, or even a late competition model. Ultimately, for projects where delivery of a solution is critically important and an early competition process may jeopardise the successful delivery of a solution, then an early competition may not be deemed appropriate. In addition, innovative solutions, particularly non-network solutions, may prove to be significantly faster to deliver and implement than traditional network solutions.

4.18. Finally, under the ESO proposals in the ECP, projects that have a hold signal in the ESO's Networks Options Assessment (NOA), but are needed in two Future Energy Scenarios

(FES) scenarios will be able to be considered for early competition. One might reasonably expect that this will mean that these projects will typically be under less time pressure for delivery compared to projects in a later stage of development where an initial design or further advancement is already in place.

Security of supply

4.19. We consider that the above arrangements in relation to delay and non-delivery would mitigate any additional risks to security of supply for suitable projects.

4.20. Furthermore, to address the risk that the competitively-appointed party does not construct or operate its project to an acceptable standard, the ECP proposes that the tender process will closely assess the capabilities of bidders and the robustness of their proposals. Once appointed, competitively-appointed parties would have enforceable obligations regarding the maintenance of the project and would also have incentives in place to ensure a secure supply. The ECP also proposes that competitively-appointed parties are subject to relevant technical and system standards and codes.

5. Overall cost benefit assessment of continuing to develop an early competition model

5.1. We have applied the costs of developing and introducing an early competition model set out in Chapter 4 to the project scenarios set out in Chapter 2, in order to determine the overall costs of early competition under a range of different project scenarios. This approach determines the level of benefits that would need to be achieved through the early competition model in order for the benefits to outweigh the costs, and it allows us to consider the introduction of the early competition model proposed by the ESO in the electricity transmission network as a long-term regulatory approach.

Scenarios

5.2. We have tested the costs of developing and introducing an early competition model against the five scenarios set out in Table 2, and summarised the results in Table 5.

Table 5 – Summary of modelling results based on high competition cost assumption

Total value of projects subject to early competition (£m)	Assumed number of projects	Cost of competition assumption	Net benefit of competitions (assuming 22% benefit)	One-off costs of setting up model		Net benefit of competitions (assuming 22% benefit) after fixed costs
0	0	High	0.0	-6.9		-6.9
20	1	High	-3.3	-6.9		-10.2
40	2	High	1.1	-6.9		-5.8
60	3	High	5.5	-6.9		-1.4
80	4	High	9.9	-6.9		3.0
25	1	High	-2.5	-6.9		-9.4
50	2	High	3.1	-6.9		-3.9
75	3	High	8.6	-6.9		1.7
100	4	High	14.1	-6.9		7.2
50	1	High	2.0	-6.9		-4.9
100	2	High	13.0	-6.9		6.1
150	3	High	24.0	-6.9		17.1
200	4	High	35.0	-6.9		28.1
100	1	High	10.9	-6.9		4.0
200	2	High	32.9	-6.9		26.0
300	3	High	54.9	-6.9		48.0
400	4	High	76.9	-6.9		70.0
250	1	High	37.6	-6.9		30.7
500	2	High	92.6	-6.9		85.7
750	3	High	147.6	-6.9		140.7
1000	4	High	202.6	-6.9		195.7
1000	1	High	171.1	-6.9		164.2
2000	2	High	391.1	-6.9		384.2
3000	3	High	611.1	-6.9		604.2
4000	4	High	831.1	-6.9		824.2

Sensitivity test on interface costs

5.3. As set out in paragraph 4.12 in Chapter 4, as there may be additional costs of competition relating to introducing new interfaces, for completeness of this IA we have run a sensitivity analysis below on additional interface costs of £1m per smaller-scale project, below £100m, and of £3m per larger-scale project, above £100m. We consider that this represents a high cost assumption and that efficiencies in management of interfaces would likely be made after the first competitions, reducing this cost for future competitions.

5.4. The results of that sensitivity analysis is presented in Table 6.

Table 6 – Sensitivity analysis on interface costs

Total value of projects subject to early competition	Assumed number of projects	Cost of competition assumption	Net benefit of competitions (assuming 22% benefit)	One-off costs of setting up model	Potential interface costs (£m)	Net benefit of competitions (assuming 22% benefit) after fixed costs
0	0	High	0.0	-6.9	0.0	-6.9
20	1	High	-3.3	-6.9	-1.0	-11.2
40	2	High	1.1	-6.9	-1.0	-6.8
60	3	High	5.5	-6.9	-1.0	-2.4
80	4	High	9.9	-6.9	-1.0	**2.0**
25	1	High	-2.5	-6.9	-1.0	-10.4
50	2	High	3.1	-6.9	-1.0	-4.9
75	3	High	8.6	-6.9	-1.0	0.7
100	4	High	14.1	-6.9	-1.0	6.2
50	1	High	2.0	-6.9	-1.0	-5.9
100	2	High	13.0	-6.9	-1.0	5.1
150	3	High	24.0	-6.9	-1.0	16.1
200	4	High	35.0	-6.9	-1.0	27.1
100	1	High	10.9	-6.9	-3.0	1.0
200	2	High	32.9	-6.9	-3.0	23.0
300	3	High	54.9	-6.9	-3.0	45.0
400	4	High	76.9	-6.9	-3.0	67.0
250	1	High	37.6	-6.9	-3.0	27.7
500	2	High	92.6	-6.9	-3.0	82.7
750	3	High	147.6	-6.9	-3.0	137.7
1000	4	High	202.6	-6.9	-3.0	192.7
1000	1	High	171.1	-6.9	-3.0	161.2
2000	2	High	391.1	-6.9	-3.0	381.2
3000	3	High	611.1	-6.9	-3.0	601.2
4000	4	High	831.1	-6.9	-3.0	821.2

Conclusions

5.5. Our analysis shows that it will take a very limited level of investment being subject to early competition before the expected benefits that early competition can deliver are likely to comfortably exceed the estimated development costs of £5.3m - £6.9m.

5.6. The results in Table 5 indicate that even at the higher end of the cost estimate for setting up and running early competitions, as long as early competition is applied to £100m in capital expenditure (capex) across four tender processes, the level of consumer benefit delivered will exceeed the ESO estimated £5.3m - £6.9m in development costs.

5.7. Our analysis shows that if no projects progress through early competition as a result of the project-specific CBA, the consumer detriment would be in line with the one-off implementation costs of £5.3m - £6.9m. In the worst case of only very few projects of low value being taken forward through early competition, this detriment could increase to £11.2m.

5.8. Our qualitative assessment of benefits highlights the potential for these costs to be outweighed by savings made in the design, construction and operation costs through early competition. We have observed significant cost savings from competitions for the market in other areas such as CfD auctions, Thames Tideway project and more comparatively, for early competitions for electricity transmission in North America. Our review of these projects suggest a range of savings is possible from 22% to 42% relative to the initial indicative design.

5.9. For the purposes of taking a conservative estimate of the likely benefits to ensure the robustness of this IA, we consider that the bottom end of the range, 22% represents a suitable figure to use in our analysis. We consider that such a savings figure is realistic. This is because, as set out earlier, the policy intention is that early competition would only be applied to suitable projects identified following a CBA. This should allow early competition to be targeted where it can provide a wider range of innovative solutions to drive savings.

5.10. A 22% saving across £100m of capex investment would represent a saving of £22m. Even if the £100m of investment was spread across four tender processes, with no other early competitions ever being run, this benefit would almost certainly make the cost of developing the early competition model worthwhile. Given the level of investment needed to reach the GB Net Zero targets, there is likely to be a significant number of projects that

on their own are significantly higher value than £100m, with some prospective projects likely to be greater than £1bn in value.

5.11. Overall, we consider that given the potential pipeline of projects that might meet the criteria for early competition and be considered suitable following a CBA, the potential savings from implementing option 1 are likely to far exceed the development costs. We therefore consider that the evidence overwhelmingly suggests that the potential savings from introducing competition are likely to be above the costs we have modelled in this IA. Furthermore, the above analysis does not consider the likely wider benefits of introducing early competition in terms of driving innovation, providing price discovery, and a wider set of intangible network benefits.

6. Distributional effects of an early competition model

6.1. In Table 7 below, we have considered distributional effects of an early competition model compared to the status quo arrangements.

Table 7 – Distributional effects of an early competition model

Ofgem	Limited costs associated with regulatory oversight (referred to as 'approver role') of early competition models are outlined in Chapter 4. Some of these costs fall directly on Ofgem and are passed through to licensees and ultimately onto consumers through network charges on generators and suppliers.
Incumbent licensees	Any savings or additional costs from applying an early competition model to a project will be applied to the revenue the licensee recovers through their licence relating to that project. In line with the findings of this IA, we consider it more likely that the early competition model will drive savings, which will therefore lead to lower levels of costs recovered by licensees.
ESO as "Procurement Body"	If the ESO runs the competition within the role of Procurement Body, it is likely to face additional costs to carry out its activities in relation to specific early competition tenders, as set out in Chapter 4. We propose that additional efficient costs associated with these activities will be recovered by the licensee, either from the competitively-appointed party, or via their price control funding, depending on the timing and nature of the expenditure. The additional costs under either route will ultimately be recovered from consumers through network charges.
Bidders	We highlighted bidder costs in Chapter 4. These remain with the bidder, unless it is successful and is appointed

	as the competitively-appointed party, when it recovers these costs as part of its tender revenue stream. The tender revenue stream will be paid through network charges, ultimately from consumers.
Supply chain	Companies and individuals supplying goods and services in the construction and operation of projects subject to early competition may face increased costs from engaging with an increased number of parties, as they engage with bidders during the competition. However, an early competition model also likely benefits supply chain companies by widening business opportunities to projects beyond the procurement frameworks to which they currently have access.
Generators and demand users of the system	Savings or additional costs from applying an early competition model to a project will be passed to generators and demand users of the system through network charges under the charging arrangements in place at the time. In line with the findings of this IA, we consider it more likely that early competition will drive savings, which will therefore be beneficial to generators and demand users of the system. There may be potential risks to generators of project delays; however, we expect these to be mitigated through policies as set out in Chapter 4.
Consumers	Costs falling directly on Ofgem, ESO or incumbent licensees are recovered through network charges on generators and suppliers, who in turn will pass these network costs on to consumers. Savings or additional costs from applying an early competition model to a project will therefore be passed on to consumers. In line with the findings of this IA, we consider it more likely that early competition will drive savings, which will therefore be beneficial to consumers.

	We do not foresee any additional impacts of our decisions on vulnerable consumers as a subset of GB consumers.
Geographic distributional impact	An early competition model does not distinguish between geographical locations of projects. Suitable projects across Great Britain can be taken forward under an early competition model. We cannot say at this stage which projects in which locations are likely to progress, as this is dependent on changing system need and generation background.
Intergenerational equity	Under an early competition model the regulatory asset value of the projects will be fully depreciated after the conclusion of the construction and operational period. We currently expect the operational period to be determined by the length of the network need identified, rather than always remaining at 45 years in the RIIO counterfactual. Despite expected savings from an early competition model overall on an NPV basis, there is therefore a possibility that consumers may ultimately pay more on an annual basis for each project during a shorter operational period. Ultimately, consumers will benefit significantly overall (ie over the 45 year period), and may pay significantly less during the construction period for the project.[14] We do not consider that there will necessarily always be a shorter regulatory depreciation period under early competition than under the RIIO status quo. We do not consider that the limited impact on intergenerational equity transfer that an early

[14] This is because under the early competition model revenue may not be paid during construction, while some revenue is typically paid under the RIIO 'status quo' arrangements.

	competition model may have justifies not pursuing the overall level of savings available.