

| Engineering Justification Paper – Pre-Engineering Works | | | | |
|--|--|-----------|-----------|-----------|
| Name of Scheme/Programme | Pre-Engineering Works | | | |
| Primary Investment Driver | Pre-engineering work for load projects | | | |
| Scheme reference/mechanism or category | SPT200136 Wider Works | | | |
| Output references/type | LRT2SP2050 | | | |
| Cost | £18.2m | | | |
| Delivery Year | 2021 - 2026 | | | |
| Reporting Table | B0.7 Load Master Data B4.2a Scheme Summary B4.5 Scheme Asset Data B4.5a Scheme Asset Data | | | |
| Outputs included in RIIO T1 Business Plan | No | | | |
| Spend apportionment | Scheme | T1 | T2 | T3 |
| | SPT200136 | - | £18.2m | - |

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1 Introduction

This paper provides justification for pre-engineering funding for a number of load-related projects. This funding is intended to cover activities including:

- Detailed design
- Specialised design studies
- Environmental impact assessments
- Audible noise surveys and studies
- Stakeholder engagement
- Onshore and offshore surveys
- Manufacturer engagement
- Consenting

This will allow us to progress with the development of projects that have not yet been funded, e.g. existing or future NOA projects, or projects that are funded under an uncertainty mechanism prior to funding being granted, e.g. synchronous compensators.

The following sections outline some key projects for which pre-construction funding is sought. The table below outlines these projects and how the funding has been apportioned. A comparison with RIIO-T1 is also shown and we have sought to keep the annual expenditure consistent.

Table 1. Pre-construction funding

| Project | RIIO-T1 (£m) | RIIO-T2 (£m) |
|--------------------------|------------------------|---------------------------|
| NOA Projects | - | 5.29 |
| Eastern Link HVDC (SWW) | - | 2.86 |
| Synchronous Compensators | - | 4.76 |
| Torness Closure | - | 2.65 |
| Other Projects | - | 2.65 |
| Total | 28 (£3.5m p.a.) | 18.21 (£3.6m p.a.) |

2 Projects

2.1 Network Options Assessment (NOA) Projects

Since the initial NOA process in 2015, the rapid growth in generation seeking connection in the north of GB and the continued decline in overall transmission demand has led to growth in required transfers north to south year on year. This has seen modest recommendations in the initial years of the process grow into recommending a significant level of transmission network reinforcement across all of the GB transmission network areas. The NOA4 report¹ gave recommendations that would see investment of £5.4bn across the system. In addition to the known projects, further ‘notional’ reinforcements were seen as required that equalled the addition of a further 2GW over each boundary from B2 down to B8. This notional reinforcement has led the TOs to submit further projects into NOA5 which are at early stages and therefore have not been scoped enough to have specific project detail included within the RIIO-T2 plan. As the NOA is an annual process, the requirement for the TOs to submit additional

¹ Network Options Assessment Report 2018/19
<https://www.nationalgrideso.com/publications/network-options-assessment-noa>

boundary reinforcements each year will continue as the generation landscape changes, and as a function of this, new projects will require to be developed throughout the RIIO-T2 period that will not have been considered through this planning stage. Should any of the new options be considered as economic to the NOA process, preconstruction funding will be required in order to develop options to a stage that a business case can be made on a project-specific basis to provide funding.

Currently, an assessment has been made on the new projects considered within this year's NOA (NOA5, the results of which will be publicly available within a report by the ESO in January 2020) and factored into the requested preconstruction funding should a proportion of these projects, or similar, be recommended via NOA at any stage through the RIIO-T2 period.

2.2 Eastern Link HVDC

Each of the GB onshore transmission license holders were provided with preconstruction funding through the RIIO-T1 period to progress with the development of the Eastern HVDC link. At the beginning of the T1 period, works were undertaken by the TOs and the ESO to determine that the wider system need for a large reinforcement on the East of GB was not as strong as the requirement for a reinforcement on the West (Western HVDC Link) and therefore the development of this project in these early years was stopped. The needs case however, was continually assessed by all TOs and the ESO, and through the NOA process the requirement for significant East Coast reinforcement is now seen as critical to the development of the GB transmission network.

In order to progress with the development of an Eastern HVDC link to deliver in line with the recommendation from the NOA process in 2027, further to the funding within the RIIO-T1 period which we are currently forecast to fully utilise, further preconstruction funding will be required. The funding requested will fund the detailed design of the link, further environmental activities, including engagement with both onshore and offshore stakeholders, onshore and offshore surveys, engagement with manufacturers and progression through the consenting process, all of which fall under the criteria for pre-construction funding.

Details of the costs associated with this are shown in BPDT 4.9 (SWW Memo). £2.86m is required for this element.

2.3 Synchronous Compensators

The ESO is currently conducting its Stability Pathfinder project², which aims to procure stability services across GB. Tender phase 1 is currently open for stability services, for providers that can start before the beginning of RIIO-T2³. At this time, the volume and timing of stability services that will be contracted, as part of the phase 1 or future tender phases, is uncertain.

If suitable stability contracts are not placed, or if these only provide a part of the requirement, our RIIO-T2 business plan includes synchronous compensators that can be installed under an uncertainty mechanism⁴ (engineering justification paper reference EJP_SPT_SPT200137). We are working closely with the ESO on the Pathfinder project and will submit our synchronous compensator projects to future tender phases as a TO participant.

² See <https://www.nationalgrideso.com/publications/network-options-assessment-noa/network-development-roadmap>

³ Phase 1 tender closing 17 January 2020 for stability services starting between April 2020 and April 2021.

<https://www.nationalgrideso.com/balancing-services/system-security-services/transmission-constraint-management?market-information>

⁴ See engineering justification paper reference EJP_SPT_SPT200137.

The timing of these installations is important to get the network ready for Net Zero and the closure of the last large synchronous plant on our network. In order to meet the proposed delivery timescales for these projects, we need to continue developing the designs and specifications for this plant. Audible noise is of significant concern at all the proposed sites and it is important that accurate noise surveys are included in our tenders for this equipment. We also anticipate significant activity around supplier and stakeholder engagement, specialist design studies and establishing a detailed location and layout for each installation.

2.4 Torness Closure

Our RIIO-T2 business plan includes a number of projects that will help to ensure that our network is ready for the closure of Hunterston and Torness nuclear power stations, currently anticipated to be in 2023 and 2030 respectively. The closure of Torness and the establishment of Branxton 400 kV substation also provides an opportunity to decommission the Torness 400 kV GIS substation and remove around 24,000 kg of SF₆ from the network. However, an alternative 132kV feed would need to be provided for the power station and the 132 kV network normally fed from Torness 400 kV. Pre-construction funding is required to consider this option in detail, including the impact on the power station and potential routes for a 132 kV circuit, e.g. from Crystal Rig.

2.5 Other Projects

It is likely that we will develop further new projects, e.g. candidate schemes for future NOA assessment, or more anticipatory schemes developed in cooperation with a wider group of stakeholders, such as local, Scottish or UK government, renewables developers, etc. Such schemes may develop rapidly to the point where pre-engineering work such as route surveys or wider supporting analysis has to be commissioned.

3 Future Pathways – Net Zero

3.1 Primary Economic Driver

The primary driver for this investment is to provide funding for pre-engineering work on future projects that have not yet received funding. This allows project development to proceed so that planned delivery dates are not compromised. It also provides funding for the development of e.g. new NOA projects or more anticipatory schemes.

3.2 Payback Periods

A payback period has not been considered.

3.3 Pathways and End Points

This funding is justified in all Future Energy Scenarios.

3.4 Asset Stranding Risks

There is no asset stranding risk associated with this funding. There is a risk that pre-construction funding is used to develop projects that do not proceed to delivery. However, this has to be weighed against the cost of delaying projects (i.e. not starting development) until there is more certainty that they will be required.

3.5 Sensitivity to Carbon Prices

This funding is not sensitive to carbon price changes.

3.6 Future Asset Utilisation

This paper justifies pre-construction funding and has no direct impact on future asset utilisation.

3.7 Whole Systems Benefits

By continuing to develop uncertain projects, we ensure that delivery timescales are not compromised and that assets are delivered and commissioned at the right time to provide benefit across the whole system.

4 Conclusion

This paper has outlined a requirement for pre-construction funding for a range of projects, which will allow us to progress with the development of projects that have not yet been funded, or projects that are funded under an uncertainty mechanism. This ensures that project timelines for less certain projects are not compromised and that they can be delivered in an economic and efficient manner

5 Supporting Documentation

None

6 Outputs included in RIIO T1 Plans

No outputs are included in RIIO-T1 plans.