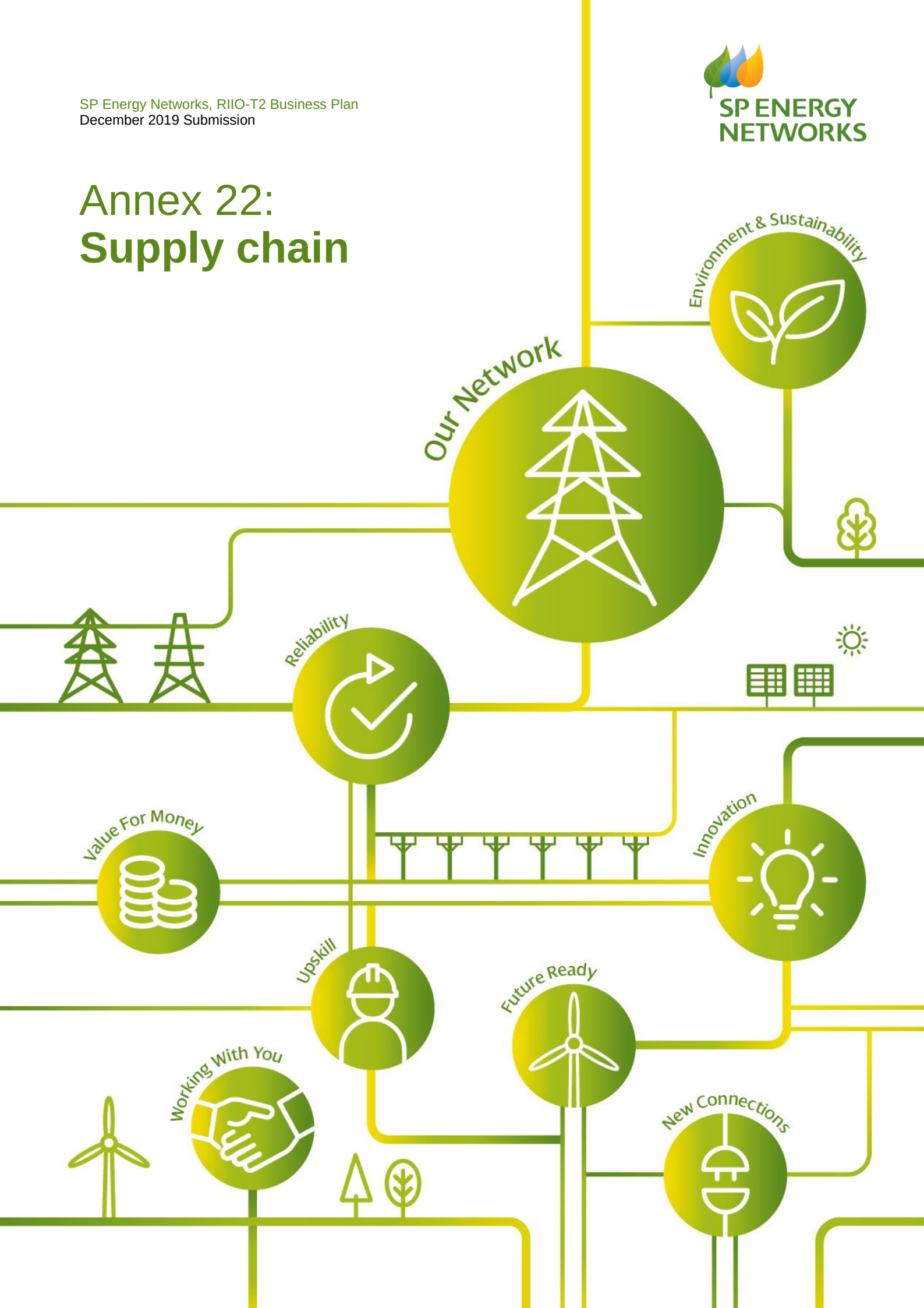
SP ENERGY NETWORKS

Annex 22:
Supply chain



CONTENTS

Version Control – temp to be removed from final version			
Draft	Date	Name	Comment

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

Version Control – temp to be removed from final version			
Draft	Date	Name	Comment

INTRODUCTION

A key part of our plan is not only the activities that we undertake, but also that we have the confidence and evidence that the plan can be delivered. To do this, we have a key dependence on our supply chain's ability to support us in the delivery of this plan. This Annex details how we propose to address these challenges.

Throughout this annex we will provide further information on the make up of our supply chain, how they support our business throughout the whole project lifecycle and how well they are prepared for the challenges associated with their support needed to deliver out T2 plans,

In direct response to questions raised though the various challenge groups we have identified what we have done and how we will continue to communicate and engage with our suppliers to better understand how we can work together to deliver our RIIO-T2 plan. Specifically we provide details of how collaboration with our suppliers and shared ambition will allow us to meet our environmental and Net Zero Carbon tagets and how we must balance the delivery of our overall key criteria and the needs of our suppliers to enable them to prepare for the sucessful delivery of our plan.

EXECUTIVE SUMMARY

"Complex Projects rely upon a resilient, compliant innovative Supply Chain to make sure we deliver our Commitments"

Our supply chain is well placed to support us to sucessfully deliver our RIIO-T2 plans.

Our forecasting of the supply chain requirements for RIIO-T2 has allowed us to carry out a detailed gap analysis between this and our supply chain current capacity and future requirements.

This has identified that the works undertaken in RIIO-T1 to develop a robust and resilient supply chain using our flexible delivery models has ensured that our RIIO-T2 plans can be delivered by our existing supply chain. Where analysis has identified areas of enhanced risk with regards to overall industry capacity, we will continue to look to expand our supply base both within the UK and elsewhere to minimise this risk.

We are in a period of accelerated change stipulated by the need to address carbon reduction, environmental compliance and sustainability and the preparedness of our supply chain is a key element in our assessment. Our works to understand our suppliers through various methods gives us insight into the new and emerging challenges ahead. This has identified the need to provide renewed focus on managing our supply chain in relation to their key deliverables.

OUR SUPPLY CHAIN

We work closely with our supply chain and this relationship is critical to the successful delivery of our plans. Our suppliers provide a wide range of services including design, manufacture and installation. Working collaboratively with the supply chain ensures all aspects of our RIIO-T2 plan will be delivered safely, efficiently and in compliance with all legislative and regulatory requirements whilst looking to go beyond compliance in targeted areas. Our supply chain delivers specialist services, capability, products, core competence, and services augmenting the expertise and skills we have. We use the supply chain to support the delivery of categories such as:

- Equipment and material manufacturer and suppliers
- Installation and commissioning of transmission plant and apparatus
- Planned maintenance and repair of specialist equipment
- Overhead line refurbishment, erection and painting
- Cable Manufacture, supply, installation, refurbishment and maintenance
- Security fencing, building and perimeter security systems
- Landscaping
- Legal services
- Planning and environmental consultancy
- Geotechnical & environmental surveys
- Civil and construction expertise

The supply chain is a vital and necessary extension to our workforce to make sure we deliver on our commitments throughout the whole lifecycle of each project. During T2 we will work with our supply chain to maintain a collaborative relationship ensuring that not only do we deliver our plans on time to the highest quality, but they are delivered in a more environmentally sympathetic and sustainable way to fulfil our commitments within our overall plan.

PROJECT DURATION

Our suppliers have supported the creation of our overall plan, will continue to support the development of our projects and will provide the necessary plant, equipment, construction and commissioning skills necessary to deliver our RIIO-T2 works. They support us throughout the project lifecycle and their input can vary substantially depending on the supplier type, project durations and project stage. Project durations vary substantially as a result of the size and scope of the project, specifically if there are significant planning and consenting requirements. Figure 1 gives some insight into both the variance of project durations but also the stages of involvement for different types of suppliers through the whole project lifecycle.

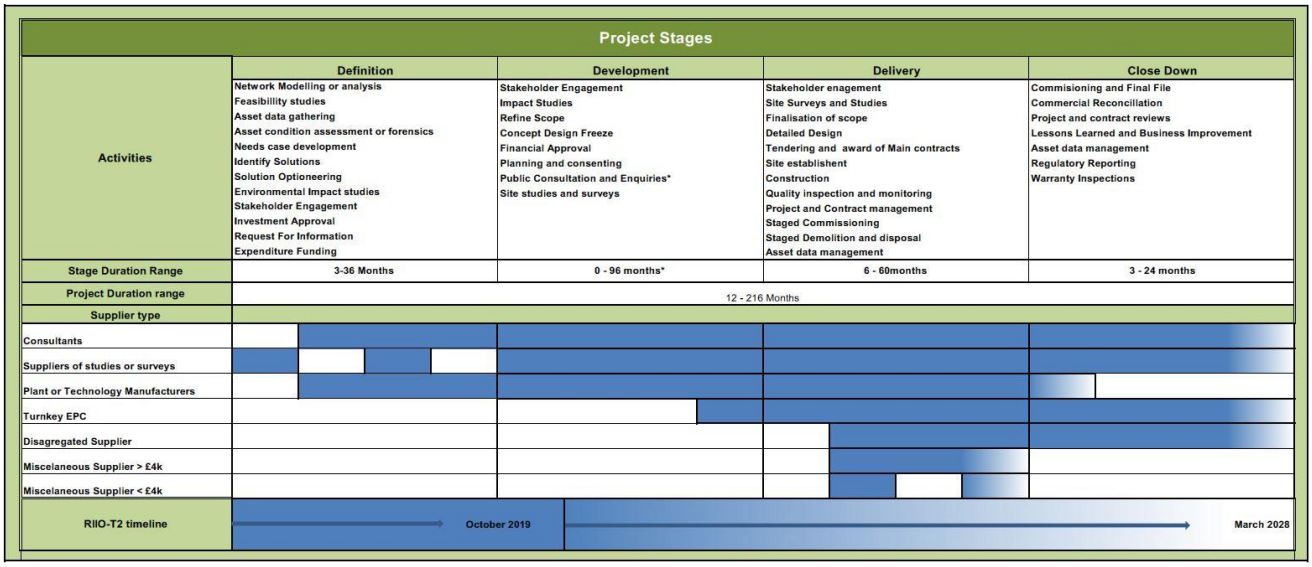


Figure 1: *Project lifecycle*

Below we provide 2 examples of projects at either end of the project lifecycle durations.

Denny Wishaw – Example project lifecycle

Although this project has been under consideration for over 10 years internally, it was originally submitted through the NOA Process in 2015 and has been under formal consideration and assessment since then. The NOA process indicated the project should 'proceed' to meet the earliest 'in service' date being 2028.

The overall timeline of this project is around 15 years (2015 – 2030) when the closedown phase is also included.

These timescales assume that this project does not trigger a Public Enquiry or encounter any significant consenting issues. Our upper range in the table is 216 months (18 years) which may be necessary in the event of a Public Enquiry or if any significant re-working of any Planning application is necessary.

Load Management Scheme (LMS) – Example project lifecycle

LMS projects are developed to facilitate non-firm connections of generation to provide a faster time to connect by managing them on a real time basis. Some LMS schemes can be designed and implemented within 12 months of initiation however, these typically entail simple modification of an existing or pipeline LMS scheme which is already contracted. These works have normally included the installation of additional monitoring equipment and redesigning and programming of the load management scheme logic.

SUPPLIER PROFILE

Our suppliers are made up of a range of international, national and regional suppliers with total sales turnover ranging from £500k to £10b+. The larger suppliers often provide design, manufacture, install and repair services divisionalised into specialist services located in key client locations worldwide and offer multiple categories shown in the list above. National and regional suppliers offer mainly scaled down local specialist services; irrespective of the type of suppliers we ensure, through various methods including factor acceptance testing, onsite inspection, auditing, that performance standards and quality of the services are uniform throughout.

Throughout RIIO-T1, one of our major successes has been our ability to deliver our project plan efficiently, to a high quality, while maintaining excellent standards associated with health and safety and environmental compliance.

It is essential that we select suppliers who have the ambition to mirror our own code of ethics, values, standards, and can integrate seamlessly with us to deliver projects on time, while continuously demonstrating value for money.

Our supply chain is engaged via legal contract arrangements ranging from a simple purchase order- usually for a one-off service, through to varied commercial contracts such as NEC3, BEAMA and bespoke SP Design and Build Contracts.

The engagement and development of an approved supply chain is critical to the successful delivery of complex projects like RIIO-T2. Our supply chain provides the support and agility to respond to changes in workload over the course of a price review.

We have an established track record in delivering RIIO-T1 using our existing supply chain and the learnings from T1 will be carried forward into T2. During RIIO-T1 we have used a mix of large established suppliers who engage with all UK Transmission and Distribution Operators and new entrants into the UK Transmission sector who have developed their expertise working worldwide or on UK and Ireland Distribution works. We also have many suppliers who are not restricted to work in the electricity sector and this proportion of our supply chain has grown significantly because of our flexible delivery model and increased use of smaller disaggregated contracts.

COMPLEXITY AND DELIVERY MODELS

RIIO-T2 is complex and its delivery requires a wide range of specialist expertise, capability and competence whilst maintaining compliance to legislation, regulations, and performance requirements.

The contracting strategy within SP Transmission uses a range of flexible delivery models within a structured governance regime to guarantee the delivery of projects. The most efficient delivery model is agreed between the cross functional team involved in the project, maintaining compliance to the specific commercial, quality, technical and environmental requirements. To satisfy the inherent project complexity as well as various commercial, technical, quality and environmental challenges, we rely on the use of highly skilled and qualified suppliers over numerous specialities of works.

We have a robust supply chain appraisal system designed to provide safe access to works by all suppliers and ensure the competence, capability, capacity and HSQE of the supplier we choose to work alongside.

We regularly assess the pedigree of our suppliers via compliance to 3rd party accreditation, pre-qualification questionnaires (PQQ's), requests for information (RFI's), technical assessments, HSEQ engagement, quotations (ITT's) and bi-lateral engagements.

During the delivery of T1 a significant change to our delivery and contracting strategy was introduced. It was identified that wholesale use of turn-key Engineer, Procure and Construct (EPC) contracts severely limited the width of our supply chain and overall tender competition. Only a limited number of UK and International companies had the necessary UK transmission design experience alongside the multi category capability and financial stability necessary to subcontract the required works, prohibiting them from tendering or even being considered for award of large EPC infrastructure projects. As a result, throughout RIIO-T1 we built up our own engineering and design capabilities and increasingly broke up (disaggregated) and tendered the component parts of the works to category experts.

This enabled us to engage with and appoint specialist contractors directly, opening up works on our networks to new entrants who would previously been incapable of providing the full range of expertise under EPC contracts or would have been engaged only as a subcontractor to EPC Suppliers.

We disaggregate a high proportion of our activities made possible through the expansion of our own capabilities, but we continued to retain the option of EPC delivery. We use the flexibility of our delivery model to identify the most efficient, innovative and sustainable ways of delivering our projects.

Where we have disaggregated contracts, we fulfilled Construction Design and Maintenance Regulations (CDM regs) requirements by adopting not only the roles of Client as normal, but also of Principal Designer (formerly CDM Co-ordinator), Designer and Principal Contractor.

In essence we act as our own EPC contractor.

The benefits of our flexible model

- It avoids restricting our supply chain to only those capable of all components of works associated with major project
- It allows greater ability to identify, internalize and manage risk
- It allows greater flexibility in how scheduled work is designed and planned, giving greater control of development, deployment of innovation, and embedding of sustainable methodology from the onset
- Allows the ‘free issue’ of plant and material at lower cost through the use of the purchasing power of the wider Iberdrola group

Although we have not been fully shielded from the overall market conditions, we have seen relatively few of our suppliers, either through choice or necessity, withdrawing from our supply chain. We have ensured that we do not have an over-reliance on any specific supplier, notwithstanding this our continued monitoring and the current levels of competition will allow us to mitigate any effects of future changes in our supplier base.

Our supply chain has changed over time, dependent upon delivery performance, new markets and product needs, local resources and compliance. Regular bi-lateral engagements with the supply chain help to ensure consistent performance. For each supplier discipline, we carry out annual pre-qualification questionnaires (PQQs) targeted on the planned year-ahead tenders. This offers visibility of future tenders, minimises the need and workload for both SPEN and our suppliers associated with project specific PQQs. This pre-qualification is reviewed throughout the year to ensure that we do not overlook new entrants or continue to engage with suppliers who have consistently underperformed.

We will ensure the use of high-quality suppliers offering the best and most efficient products and services consistent with the need to evolve industry best practice.

Governance and procurement process

Figure 2 provides an illustration of how suppliers can enter our supply chain, how we formally and informally communicate with them and the governance and gated processes followed by the procurement team and supply chain stakeholders within the business. Operating a Rigid governance process is essential to ensure the strict compliance to technical, commercial, Scottish Power policy and Client requirements.

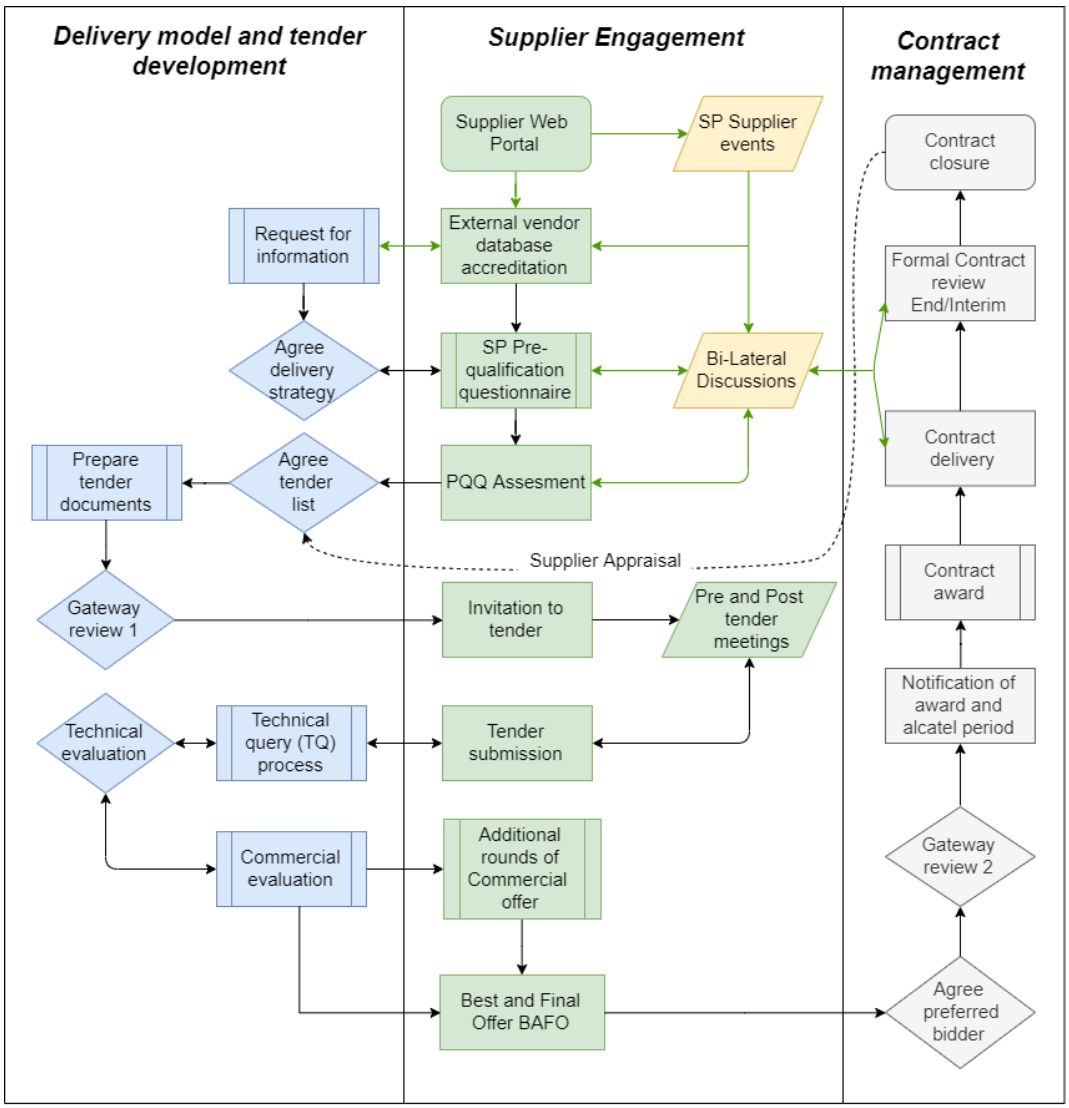


Figure 2: *Procurement process*

SUPPLY CHAIN ENGAGEMENT

Purpose

The main purpose of engaging with our supply chain is to ensure that we better understand our supply chain, ensure that they are ready and capable of delivering the remaining works in RIIO-T1 and our RIIO-T2 plan and to ensure we work together in a collaborative and efficient way.

We need to gauge that our suppliers are both willing and able to mirror our own ambitions to embed innovation, sustainability and carbon reduction into all our activities and address any potential disconnect. As their client we need to demonstrate leadership and support them in being suppliers for the long term who consider, as standard, all effects of their activities in all stages of their operations. It is critical that our strategic future plans and that of our supply chain align.

How we do this

We engage directly and regularly with the supply chain to discuss specific areas of focus including their needs and their current and ongoing plans regarding capabilities and capacity.

We communicate our ongoing requirements to our suppliers but also ensure we understand their difficulties and concerns regarding the conflicting challenges of delivering a better future quicker in a low cost and efficient manner.

Our standards and policy department are in constant ongoing discussion with manufactures to gain an understanding of new emerging technologies. Our targeted use of design houses allows our own design resource exposure to the wider construction industry and innovation in both new materials, methods of construction and carbon reduction within design.

At site our own delivery teams interact daily with all suppliers during construction. We have formalised daily setting to works procedures; we hold weekly programme and activity reviews to allow works to be planned and co-ordinated in advance in a safe and efficient manner.

Beyond this, there are monthly project review meetings to discuss project specific issues and quarterly bilateral meetings between our key supplier contacts and stakeholders to discuss our ongoing relations in more general terms.

Planning, designing and delivering our work in a safe and environmentally sensitive manner is paramount to our activities. To ensure that we are continuously working to improve on these aspects, we hold Bi-Annual Health, Safety Quality and Environment forums open to all our supply chain, irrespective of whether they are currently contracting with us or not. These are designed to be a vehicle for informing our supply chain of our own areas of HSEQ focus but also allowing our suppliers to share their wider experience and work alongside us in collaboration to address areas of mutual concern.

In the last two years we have covered topics such as:

- Mental Health and emotional resilience
- Silcacosis and dust
- Working at heights
- Plant and vehicle movements
- Underground service strikes
- Inspection Test Point (ITPs)
- Project 360^0 Health
- Ground water dependant ecosystems
- Protection of private water supplies
- Protected species - Bats

Complementing the Client/Supplier operational meetings, we engage key suppliers in regular participative forums and events. Alongside our annualised PQQs, these forums present suppliers with the latest and most current business workload projections and identify the strategy set to deliver projects.

Collaborating with our suppliers and feedback from these events support our understanding and assist in forming action plans and ongoing strategies.

Newsletters and bulletins are issued frequently to keep the wider supply chain informed of our progress, new developments, forward tender opportunities and to promote feedback from suppliers.

Feedback from the supply chain

Our engagement with suppliers has told us that they want:

- To support our ongoing drive to improve health, safety, quality and environment
- More visibility of work in the pipeline
- To reduce tendering through more use of frameworks
- More qualitative assessments of their tender
- Early Supplier involvement (ESI) to share their innovations and expertise early in the project
- Have differing attitudes to “free issue” materials
- To engage in opportunities to secure longer order books
- Address the significant challenge of a Net Zero Carbon future

Compliance to various ISO standards is part of the accreditation of our supply chain, however we consider that compliance should be the baseline and we target beyond compliance performance by instilling greater ambition to drive carbon reduction, innovations to embed eco-design into the design process and drive sustainability in procurement.

We have identified that a greater understanding of our supply chain is necessary to gauge supplier maturity. We need to fully understand where some suppliers may be able to assist SPEN in accelerating our own development and formalise plans to evolve those who are only starting to address these critical areas.

Agreement on goals and targets, which support our plans, alongside structured collaboration with our supply chain will drive progress forward together.

Iberdrola have incorporated the *Sustainable Development Goals* (SDG) defined by the United Nations, and in response created policies and procedures for the subsidiaries to comply with. A main principle of conduct is to have a global environmental management system, which allows for a reduction in environmental risks, improving the management of resources and optimising investments and costs. Significant progress has been made over the years within SPEN to firmly establish baselines and report progress in achieving the SDG. However, it is recognised that harnessing the collective power of the supply chain compliance in the key areas of the management of sustainability, innovation and carbon management will compound the impact we can have in meeting the critical requirements.

As a result of this we have undertaken an extensive supply chain survey developed to both corroborate our existing understanding of our suppliers’ strengths and weaknesses and provide a better insight into these key emerging areas. Our Supplier Survey is discussed in more detail in section 8 of this document.

We are looking to establish additional bi-lateral meetings with our supply chain dedicated to developing agreed strategies based on areas highlighted through the survey responses and contract reviews with the aim to introducing baselines, action plans and metrics for continuous improvement.

We will review the structure and content of our strategic meetings and these will be driven by a Senior Manager with specific responsibility for our Supply Chain who will partner with subject matter experts from within the business. The strategic aim will be to accelerate supplier evolution and expertise within critical key requirements. These co-ordinated engagements will firmly address performance against key requirements and work to embed these activities into a “business as usual” mode.

Innovation is critical to us delivering our overall aim and we will continue to work closely with our suppliers to ensure we are fully prepared for the introduction of new technology. We have been successful in the delivery of numerous collaborative innovations and an example of the work undertaken in RIIO-T1 is provided in the supplementary Appendix A- *High Temperature Low Sag (HTLS) conductor collaboration*.

SUPPLY CHAIN RESILIENCE

Market conditions, political and business commercial change rapidly increase business risk, requiring the supply chain to put in place resource and procedures to deliver efficient, compliant and competitive services to their clients.

We recognise that our supply chain will change; some suppliers may make the strategic decision to withdraw themselves from our or the wider electricity industry market, while others might look to consolidate around current clients and workbooks. Some will look to grow within our own supply chain and others may look to diversify and tender with new clients and within new categories of work in the RIIO- T2 which they did not do so in previous years.

We are also aware that the need for change within the electricity supply sector dictates that there is a significant body of works required over the next regulatory period and beyond to prepare for decarbonisation of the transport sector and UK electricity networks and achieve longer term Net Zero Carbon goals.

The current market, especially the infrastructure and construction type business sectors, has been subject to significant changes causing increasing business pressures on cash flow, margins and profitability. Rapid changes in the last 10 years in technology, complexity in projects, safety and environmental regulations, attitude to risk and worker regulations have necessitated the sector supply chain to adapt and work in very different ways. Many high-profile suppliers have restructured to remain in business and several leading suppliers have entered into receivership causing related and supporting suppliers to absorb the volatile market changes.

Out with the electricity sector there are many new major construction and infrastructure projects planned and occur in the same timeframe as the RIIO-T2 project. Major UK building projects, such as Hinkley Point C and HS2 will present substantial contract and supply chain risks. A number of our suppliers have interests in these major projects.

We have already engaged with our supply chain to share our overall resource requirements for RIIO-T2 and we will continue to monitor any localised impact of these projects on our suppliers

Brexit could potentially reduce the availability of skilled operators; a number of our contractors have a reliance on non-UK nationals with skills and expertise that is not widely available in the UK. A significant proportion of our equipment is imported and lack of clarity on trading arrangements could create new hurdles when importing equipment.

Locally in Scotland the Scottish Government's Infrastructure Investment Plan Progress Report for 2018 sets out in the project pipeline publication infrastructure projects totalling almost £3.1 billion in the short term.

In the longer term, £5 billion commitment to infrastructure investment has been identified in Scotland which will involve 50,000 affordable homes, new roads and railways, electric vehicles and delivery of 100% superfast broadband across Scotland.

Infrastructure plans in Scotland have the potential to impact on the same resource pool required for RIIO-T2 particularly our civil supply chain. We will continue to monitor new investments in Scotland and the potential impact of other major infrastructure projects such as HS2.

Supply Chain strategies are reviewed regularly to identify and minimise any risk and threats to the efficient delivery of the project and to evaluate the risk impacts of the changing dynamics of the market in the UK/EU. It is vital to engage frequently with the supply chain at a strategic level to understand the market and external landscape and thereby allow proactive management of any identified future risks, threats and challenges.

In general, despite the overall environment our supply chain has continued to evolve and grow to meet our unique delivery model. During the RIIO-T1 period we have increased our number of main suppliers from 5 to ~150 and we see significant interest in all categories currently being tendered.

We have identified the capacity of the UK overhead line contractor pool as our only specific area of concern. We are actively working with new and emerging contractors who are currently unique to us as a T.O client and with oversees OHL contractors to mitigate the risk in this category. Further details of categories of focus are detailed in the workload analysis section of this document.

SUPPLIER SURVEY

"Complex projects rely upon a resilient, compliant innovative supply chain to make sure we deliver our commitments."

Recognising the current and near future market dynamics including Brexit related risks, we have initiated a new supply chain engagement project. This initiative aims to identify opportunities for expansion and help in assessing and managing current and future resilience as well as preparedness of our existing supply chain.

Components of resilience review include:

- Understanding the scale of our suppliers based on sales
- Resource planning
- Delivery models used
- Core business expertise
- Capacity management
- Supply chain engagement
- Use of technology roadmaps, eco-design & innovations expertise
- Sustainability, environment and carbon reduction

Currently, information and data related to the supply chain is held on various portals, platforms and systems, with different information held by individual teams who have a working knowledge of our suppliers.

We identified that to successfully work alongside our supply chain we needed to have a better understanding of them. Our survey was designed to gain a better and broader understand their capabilities and consider how prepared they are for the challenges of delivering our RIIO-T2 plans and to continue to share and embed our sustainable and collaborative values.

As a result, we prepared and issued an in depth survey to a wide range of suppliers in August 2019. The main purpose of the survey was to seek responses to a specific set of questions to fully assess the robustness and resilience of the supply chain likely to support the delivery of the RIIO-T2 Plan.

The survey has been constructed to understand the resilience of our supply chains current capabilities and in new areas of focus. This was designed to provide a snapshot of their capabilities to identify any areas of concern . We will continue to engage with the supply chain to fully understand their contribution to the key areas highlighted and to agree a maturity baseline from which improvement action plans and metrics can be created and goals set.

Initial observations and comments related to sustainability, innovation and carbon reduction and other key requirements within the supply chain questionnaire are presented in a susequent section of this document, titled 'Initial observations of suppliers' responses to the survey'. The supply chain survey will contribute to thoroughly understanding and determining the maturity of the supply chain regarding their developing plans to address emerging key areas. We commit to hold strategic follow up meetings with the supply chain and establish action plans to further improve our understanding of the resilience of the supply chain.

The supply chain needs to be a seemless extension of our skills and expertise, aware and aligned with the goals, project requirements and legislative and regulatory obligations. New requirements are routinely introduced and regularly updated as the political and commercial emphasis to comply can increase dramatically.

The business plan raises several significant key requirements that will make a difference to the way we need to deliver projects and take care of the environment.

Key Areas of Interest

There is an opportrunity to improve the availailability of this data, specifically we have identified the need for an effective system to consolidate the information that comprehensively assesses the supply chain capability and resilience. To bring together the information, provide evidence of the overall resilience of the supply chain and baseline the maturity of their plans, specific categories have been identified to measure the supply chain performance. Survey questions related to each category have been developed by the SP cross functional delivery team. Six categories comprising 96 questions have been issued in the form of a survey to key suppliers.

Table 1: *Supplier survey: Key areas of interest*

Categories	No. of Questions
Business info update	15
Recruitment & Labour provision	11
Core Competence	22
Technology, Innovation, Risk	20
Supply Chain Engagement	9
Sustainability, Environment, Carbon management	19
Total Questions	**96**

Survey requests were issued to 95 suppliers based on suppliers who we interface with regularly and know the operational performance of the suppliers. Responses from the supply chain continue to be received as they complete the questions raised in the survey. To date we have received responses from a range of suppliers that represents over 56% of our annual expenditure.

We will continue to support suppliers to complete the survey responses. Ongoing analysis of supplier responses will highlight areas of specific strengths and weaknesses allowing targeted engagement to develop and jointly agree supplier specific development plans.

The Survey- Key focus areas

The survey comprised of 6 focus areas. Each focus area includes multiple questions designed to provide insight into the maturity of the suppliers' activity in each area. The suppliers' responses will be used to establish a baseline from which improvement action plans will be mutually created and worked on. The primary purpose of each of our six main focus areas is detailed as follows:

BUSINESS INFO UPDATE

- The financial strength of the supplier and their dependency on SP Transmission
- The current and planned resources including the use of agencies and subcontractors and delivery models used

RECRUITMENT & LABOUR PROVISION

- The current and planned resources including the use of agencies and subcontractors and delivery models used
- Recruitment and retention of staff, use of apprenticeships & graduates
- Reliance of Non UK Nationals in direct or indirect workforce

CORE COMPETENCE

- The current services/competencies provided and any new competence available
- The opportunity to extend the range of services provided and their benefits and efficiencies potential

TECHNOLOGY, INNOVATION, RISK

- The use of innovations registers and inclusion of eco-design principles
- Management of end of life products and circular economy plans

SUPPLY CHAIN ENGAGEMENT

- The degree of downstream engagement and communications with their supply chains. This helps to determine what sharing of goals, metrics, reporting and action plans t have been established.

SUSTAINABILITY, CARBON MANAGEMENT, SUSTAINABILITY

- The level of ambition and maturity of policy and commitments to reduce carbon in their business and products
- To agree goals, metrics and reporting and action plans for continuous improvement
- The integration of sustainability within procurement (ISO 20400:2017)

Initial observations of supplier responses to the survey

Initial observations based upon the returned supplier responses have been compiled and tables have been extracted to facilitate accurate analysis of the survey responses. These are included later in this document and have been shared with subject matter experts within SPEN. The intent is to use the analysis and initial observations to determine a baseline for the maturity of the suppliers' experience, capability, competence and business resilience. Ongoing bi-lateral meetings will be necessary with suppliers to maintain focus and embed key requirements into their normal business as usual activity. When baselines are agreed, improvement action plans along with appropriate metrics and goals will be agreed on to drive continuous improvement during T2 project delivery.

A selection of initial observations addressing key requirements summarised from the supplier responses are presented below.

INNOVATIONS REGISTER

Innovations management is a key contributor to delivering ongoing efficiencies, robust products and design solutions incorporating Eco-design.

Benefits of driving innovation can come in many forms; delivering improved reliability, efficiency, safety, cost improvement and compliance to regulatory environment and carbon reduction requirements. Typically developing innovations is in the DNA of most designers, manufacturers, installers and construction suppliers. Engagement with the downstream supply chain and the client can generate rapid innovation introduction to the market.

The survey questions in this section were presented to understand if suppliers had adopted a formal process to manage innovations, and if they shared the innovations with SP Transmission and their supply chain.

Most suppliers provided good detail in their responses indicating their support for this requirement. The survey responses sampled so far, indicate most suppliers drive some kind of innovations development; some structured and formalised others not.

Suppliers are keen to further explore how they can establish a formal process and work with us to achieve mutual benefits. Our past experience with developing innovation with suppliers highlighted a reluctance to share innovations that are in the pipeline as the supplier considers these can provide them with a competitive edge over their competition.

Next steps and commitments

The Survey response informs us that the supply chain wants to share Innovations development with us.

We will commit to include innovation development as a strategic key requirement for ongoing engagement with suppliers. Engagement in a structured way will deliver a measured degree of improved reliability, efficiency, safety, cost improvement and compliance to regulatory environment and carbon reduction requirements.

We will initiate discussions with the supply chain to determine if their innovations processes are embedded into their standard operation procedures and whether they are working continuously to develop innovation and eco-design characteristics within their designs. We will also share the innovation learning and methodologies developed that we achieve.

The SPEN contract model has evolved since adopting a more flexible approach. We now carry out significantly more engineering and detailed design in-house allowing us to have more influence in the design submitted for construction.

Sharing our approach, methodologies and the design criteria used with the supply chain, will re-inforce shared goals, eco-targets and improved designs supporting reductions in energy use and carbon emissions.

TECHNOLOGY ROADMAPS

Technology roadmaps and strategic technology planning are key to delivering projects with inbuilt carbon efficiency reductions, improved design, reliability and efficiency. Technology road mapping delivers efficiencies, more reliable products, less repair & maintenance and a structured mechanism to reduce costs.

Questions in the survey were designed to expose the robustness of supplier's support for improvement in the products they supply and service. The responses from the suppliers indicate the degree of investment by suppliers in a formal established process to delivery innovation and efficiency. The responses ranged from a simple '*no we do not have a policy'* to confirmation that *'technology roadmaps are an integral part of normal business practice'*. Technology roadmap planning may not apply to specialist services providers e.g. landscaping, demolition, design and surveys. Suppliers with no plan are at risk of being overtaken by other suppliers providing enhanced, efficient, lower cost products.

The following response was received from one of the suppliers summing up the benefits of managing Technology Roadmaps.

"Some subjects are directly related to efficiencies (such as reduced costs, reduced labour hours, reduced material use), whilst others are lowering the environmental impact in a broad sense, such as reduced electrical losses, reduced noise, use of bio-degradable fluids etc."

Considering the responses received from suppliers there is a distinct opportunity to formalise and structure the supply chain to introduce technology roadmaps linked to overall business strategy. Varied benefits will be delivered including structured cost reductions.

Generally, suppliers are happy to advance discussion with SP providing an excellent opportunity to explore benefits from engagement.

Key observations from the 31 response we received were:

- 14 (45%) advise they have a Technology Roadmap or Plan
- 5 (6%) advise they have shared Technology Roadmap with SPEN. Several who haven't indicated they would be happy to share.
- Only 1 supplier advised they review their technology roadmap plans regularly
- 10 (32%) confirm Technology Roadmaps create efficiency

This is an area for further development, in particular, getting an insight into those suppliers who would be open to sharing their technology roadmap.

SUSTAINABLE SUPPLY CHAINS

Our disaggregation of contracts has resulted in a wider supply chain base, and the introduction of numerous smaller suppliers working with us.

Sustainability by design

The Survey questions in this section were prepared to understand the suppliers' approach to creating sustainable supply chains and if they have formally integrated sustainability into procurement process. Suppliers were asked if they were working towards, have equivalent procedures or have implemented ISO 204000:2017[1].

Over 80% of suppliers in the survey are not specifically targeting ISO 20400:2017. Most recognise the benefits of the ISO but have stated they are using near equivalent processes and procedures to the standard and state sustainability is in their company culture. Further bi-lateral discussions and questioning will allow us to gauge and accurate position for all our major suppliers.

Other Observations from the survey follow:

24 Suppliers Reviewed

- No supplier currently has ISO 20400:2017 accreditation and 80% of suppliers stated they were not specifically targetting the standard at this time.
- 1 supplier states their sustanability is based upon ISO 20400 principles
- 30% state they have a sustainability policy in place

Next steps and commitments

The Survey responses clearly inform us that the suppliers are at different levels of maturity in integrating sustainability within procurement.

We will initiate discussions with the supply chain to determine if sustainability in procurement is embedded into their standard operating procedures.

We will review with suppliers the applicability and the benefits that can be realised by adopting ISO 20400:2017.

We will commit to include sustainability development as a strategic key requirement in our future engagement. Engagement in a structured way will deliver a measured degree of improved reliability, efficiency, safety, cost improvement and compliance to regulatory environment and improve the resilience of their services.

We will pursue and agree with the supply chain a baseline of the maturity and their commitment to integrate sustainability in procurement within their standard operating procedures. After the baseline is established we will jointly agree with the suppliers and action plan, suitable metrics and goals and a reporting regime to illustrate progress.

[1] ISO 20400 provides guidance to organisations, independent of their activity or size, on integrating sustainability within procurement

CARBON MANAGEMENT POLICY - BASELINE OF MATURITY

The supplier responses regarding their carbon management policy were widely varied in content and detail.

For instance, for the purpose of answering **Q23 Do you have a Carbon Reduction policy?**

a scoring matrix, displayed in table 2 below, was used to provide standard assessment criteria regarding the current maturity of the supply chain, effectively establishing a baseline of maturity.

Table 2: *Scoring Matrix – Carbon Reduction Policy*

Score	Baseline Assessment – Maturity
1	No actual policy
2	No actual policy, Responded with No. but using guidelines in another policy. Need further discussion.
3	No actual policy. Responded with Yes but no supporting comments or documents. Need further discussion
4	Responded with Yes. Referenced within another document eg, Environmental policy
5	Responded with Yes. Referenced within another document eg, Environmental policy (ISO 14001:2015)
6	Measuring a few specific topics (Basic understanding) based on policy or other document
7	Evidence provided of effective management (Limited)
8	Evidence provided of effective management (Not comprehensive) Records set clear objectives, goals & targets, metrics in place, acting on results)
9	Evidence provided of effective management (Comprehensive & Pervasive) Records set clear objectives, goals & targets, metrics in place, acting on results)
10	Continuous Improvement demonstrated - Best Practice

The initial analysis indicates the maturity of the suppliers' policy and how much work is required to demonstrate commitment to achieving best practice status. It is recognised that the supply chain will be at various stages of development in their ambition to embed this requirement and make carbon management a business as usual practice providing continuous improvement and benefits.

This analysis of the supplier baseline using the scoring matrix in table 2. Follow up discussions are planned with the supply chain to review their baseline and agree an action plan based on established metrics, goals and results.

The initial analysis using the scoring matrix is shown in figure 4 below; the illustration clearly indicates there is a long journey ahead to firmly embed carbon reduction as a 'business as usual' activity with the supply chain. The chart also clearly illustrates the baseline maturity for the suppliers reviewed.

No suppliers are achieving scores in the range of (7) Effective management to (10) Best Practice.

Collaboration with the main suppliers and ongoing discussion will provide significant benefits in the medium term especially when the mutual goals are cascaded to their supply chain. Targets will be agreed with the suppliers and their improvement against the goals will be monitored on a regular basis.

The chart in figure 4 also confirms suppliers are not all on the same maturity baseline. Suppliers with the lowest baseline will need to develop action plans that transition them quicker towards an agreed minimum acceptable rating. Figure 4 illustrates there will be suppliers that are at the beginning stages of the journey to reach a minimum acceptable standard.

The combined improvements will significantly improve the performance of our suppliers with regards knowledge and actions associated with carbon reduction within the supply chain.

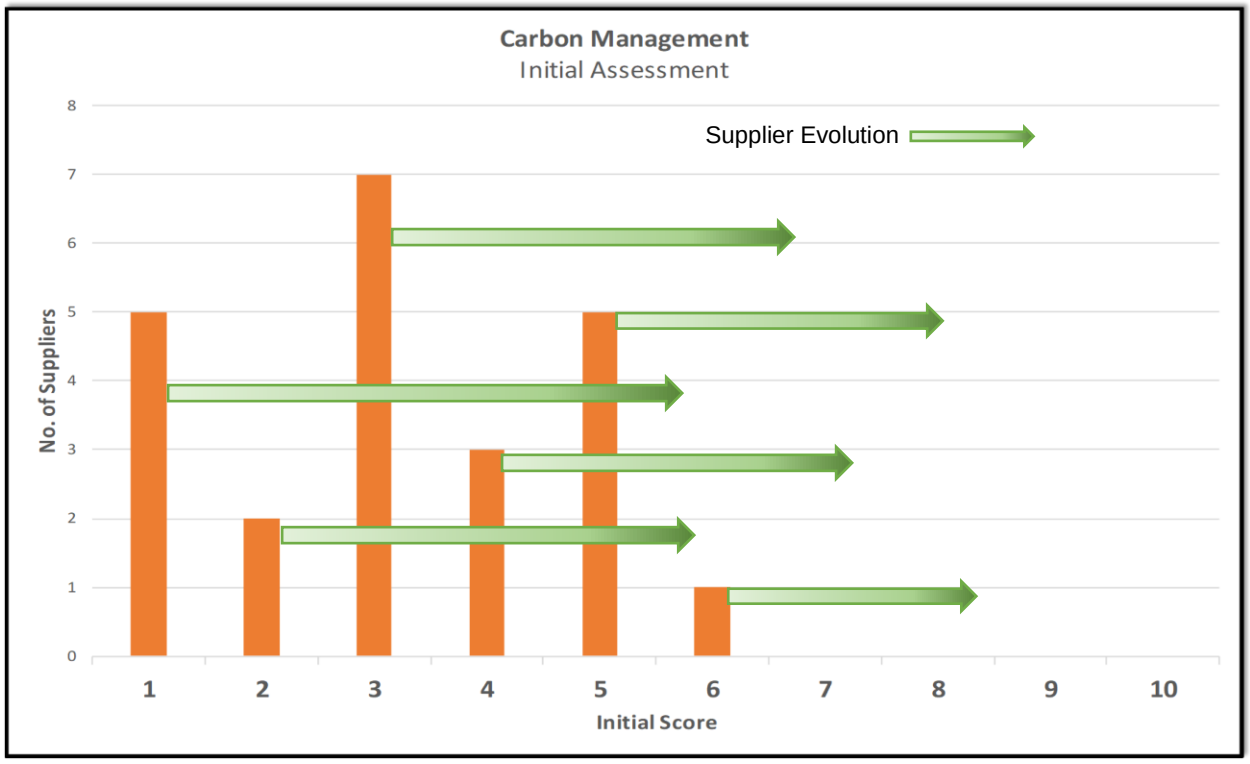


Figure 3: *Carbon management initial assessment*

Other Observations from the Survey from 24 responses

- 12 (50%) Suppliers state they have a Carbon Reduction Policy
- 20 (83%) Suppliers state they have not shared their policy with SPEN.
- 13 (54%) have shared their carbon reduction policy with their Supply Chain
- 6 (25%) are measuring carbon reduction in their supply chain

The supply chain response to this question identified scope for significant improvement over the course of RIIO-T2.

Next steps and commitments

The survey responses clearly inform us that the supply chain is at different levels of maturity in establishing robust policy and processes to achieve carbon reduction requirements.

We will initiate discussions with the supply chain to determine the degree to which carbon management is embedded into their standard operating procedures and that they are working continuously to develop carbon reductions in line with our goals. We will also share the learning and methodologies developed by SPEN to reduce our carbon footprint.

We will support the investment in resource needed to direct the supply chain to be much more pro-active in supporting this key requirement. Given the journey the supply chain needs to undertake we will mandate regular reporting of progress from the supply chain.

BUSINESS RESOURCES

The business section of the survey looked to understand the supply chain' composition of staff available to work on RIIO-T2 projects. The section requested suppliers to break down the proportions of their staff who are direct FTE's, agency workers or contractors. The survey responses also assist us in identifying subject matter expertise who bring valuable specialist knowledge. Analysis of the data available shows that most suppliers operate with a high percentage >80% of direct FTE's. Focus is mainly on the retention of long serving employees complemented by staff entering the company via their own training schools, colleges and universities. In addition to hiring qualified professional FTE staff, several companies use apprenticeship schemes to prepare the next generation of qualified experts in their sector.

Follow up and regular discussions with the suppliers will keep the partnership informed of shortages of key skills in the market. While Brexit may present some challenges, the responses from the suppliers so far indicate that they do not typically recruit from out with the UK.

Regular supply chain engagement to review staff resources will quickly identify any risks or threats posed by new infrastructure and construction projects likely to need qualified staff from the same sector pool.

Recruitment and resources

The questions presented to suppliers in this section looked to understand specifically how the changing dynamics in sector affects the retention and recruitment of experienced, qualified and specialist staff. Good detailed responses have been received so far from our suppliers confirming comments made in the business updates section. Our suppliers recognise the importance of developing its recruitment management to provide a stable workforce. To deliver their specific services many suppliers promote suitable staff from within their organisation and offer specialist training using their own training schools, local FE centres and colleges and universities. Over 80% of the suppliers are committed to developing apprentices to be trained in specialist skills needed to support the client base they provide services to. Social packages and bonuses are also used to motivate and retain staff.

It is recommended that this area of focus should be included in the proposed standard strategic agenda to be held with suppliers and attended by supply chain management stakeholders to help suppliers explore if shifting market dynamics are likely to impact the provision of capable, experienced, qualified staff.

Responses so far from suppliers are not highlighting resource risks, however as major infrastructure and construction projects across the UK are initiated we are likely to see some pressure on retaining experienced and trained staff.

WORKLOAD ANALYSIS

Comparison of contracts utilised in T1 with T2

We have, at present, a mature and stable supply chain with all categories having good competition at tender stage. In general, our suppliers are performing well, giving us an initial level of confidence that we are prepared for the volumes of works within our RIIO-T2 Plans and in turn the successful delivery of our RIIO-T2 works.

We are, however, acutely aware that a number of our larger suppliers work across the UK electricity industry and beyond and their capacity and capabilities and will be affected by expansion or contraction in the industry as a whole. Furthermore, our disaggregated model, although offering many advantages including the introduction of smaller 'category specific' suppliers, has higher exposure to risk in the event of significant short term changes in workload.

Fig 4 below shows the overall profile of awards throughout the T2 period and the split between committed works and new T2 works derived from our T2 plans. Most awards will take place up to one year ahead of works commencing, therefore this figure illustrates the volume on contracts to be awarded prior to RIIO-T2 starting.

Figure 4: *Overall Forecasted awards – Ongoing commitment and New T2 works*

We have taken our RIIO-T2 Plan and current pipeline of works project by project and forecasted which contracts are necessary to deliver these projects and the indicative value of each.

However, to understand if the forward plan of works is increasing or decreasing we have compared this with RIIO-T1 awards. To do so we have taken the historic T1 awards at category level and compared these against RIIO-T2 forecast

On this basis it is critical that we forecast our future award profiles at category level and analyse these in more detail. We have represented this data in graphs showing T1 actual awards against T2 forecast awards. This has allowed us to identify any significant differences in year on year award values and, if possible, adjust investment timings to provide a flatter award distribution.

It must be noted that although T2 awards loosely mirror investment, many awards are associated with multi-year project delivery therefore no direct correlation between award and investment profiles should be made.

For visual representation we have aligned RIIO-T1 and RIIO-T2 regulatory periods as shown in the Fig 6 below.

Although there may be some regulatory period cross over we have assumed for comparison that all contract awards in 2012 were associated with RIIO-T1 works and likewise, 2020 for RIIO-T2. This is due to the need to award contracts in advance of delivery on site allowing for lead times for manufacturing and delivery of equipment and plant, detailed programme development, HSEQ planning and necessary subcontracting activities.

We have shown regulatory years 2026 and beyond. These will effectively be RIIO-T3 works and due to the very early stage of our planning for RIIO-T3 should not be used for analysis.

Key								
T2	2020	2021	2022	2023	2024	2025	2026	2027
T1	2012	2013	2014	2015	2016	2017	2018	2019
Reg Period	RP0	RP1	RP2	RP3	RP4	RP5	RP6	RP7

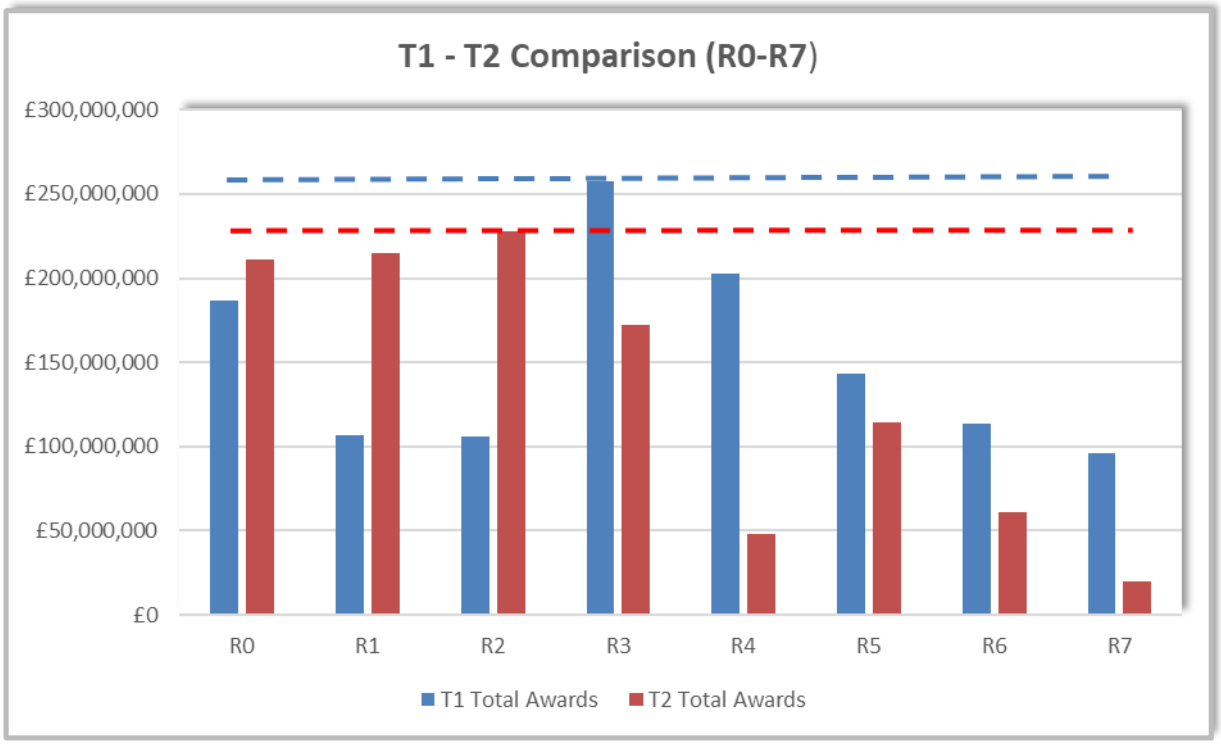


Figure 5: *Comparison of T1 awards and forecast T2/T3 Awards*

From analysis of Fig 5 we can see that the advantages of fast track in T1. This allowed significant awards in 2012 (R0) to secure early delivery of RP1 works and associated outputs. Although we forecast a need to award a higher value in 2020 (R0) despite no fast track, Fig 6 shows that RIIO-T2 regulatory period has a high proportion of committed works from T1 which were not present in the same extent within the early years of RIIO-T1.

We can also see the expected drop-off in committed works due to the dynamic and time related nature of the contracted workbook. Experience has shown that a proportion of committed works will defer because of customer requests (Mod Apps) and will, to an extent, serve to flatten out the overall award profile throughout T2.

We can see that overall there is a better distribution of awards throughout the T2 regulatory period as opposed to T1 with only an ‘awards dip’ being evident in 2024(R4). This dip is a direct result of necessary outages required to deliver a number of large multi-year projects on the main interconnected system (MITS) which in effect sterilises much of our 400 and 275 kV system to other outage related works. This is demonstrated by the peak of T2 awards in 2022(R2) and 2023(R3). As these are multi-year works the overall workload for contractor will remain stable.

As previously discussed, past experience has shown that a proportion of forecasted awards associated with committed works, which are unlikely to affect the MITS system and are as such not constraints to network availability, are likely to defer; further minimising the 2024 (R4) ‘awards dip’.

Overall category gaps analysis

Fig 6 shows forecast value of awards over the 22 main contracts categories.

This shows that although we plan to continue further disaggregation of overhead line (OHL) works in T2 by the breaking out of insulators and access works OHL contracts are still significantly the highest category of awards.

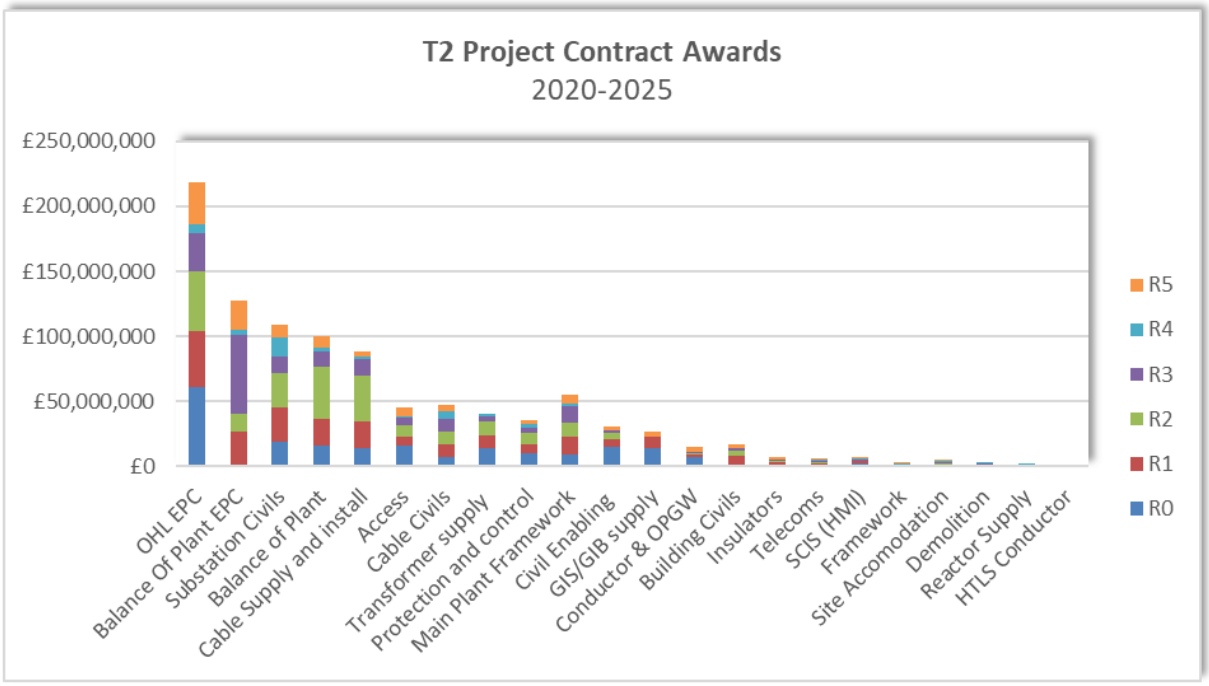


Figure 6: *T2 Category award data*

The graph in figure 6 shows C.£128M of awards under the Balance of Plant EPC category. Awarding Balance of plant under an EPC model contrasts with our normal disaggregated approach but these awards are specifically associated with a low number of high value projects. These projects Synchronous compensation[2] which we anticipate, if not awarded through a competition model and are delivered by SPEN, will be tendered under a functional specification to switchgear and plant manufacturers (or associated joint ventures). We believe at this stage that this is the best model to ensure the final technical solution is informed by the most up to date innovation being developed in the market and delivers these at lowest cost.

[2] Synchronous compensation- these are being offered for consideration under the early competition model

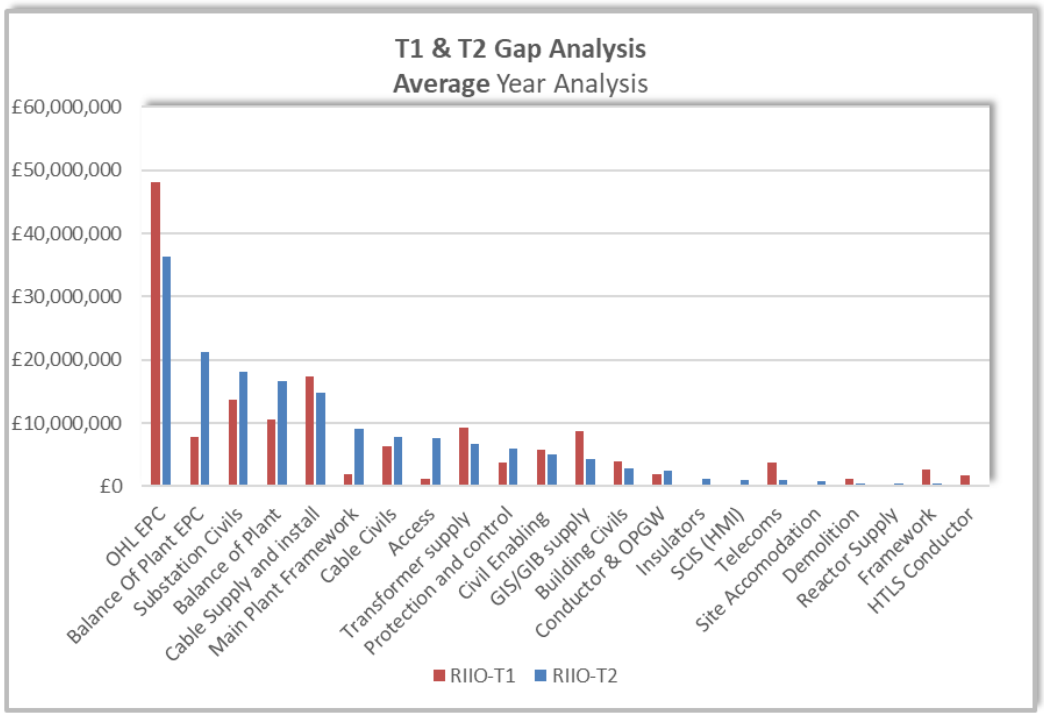


Figure 7: *Average year on year awards T1 v T2*

Due to the different regulatory period lengths the 1st stage gap analysis is best carried out on average yearly award values as shown in Fig 7 above.

Discounting the increase in balance of Plant EPC awards, the reason for which was previously discussed, this graph shows some significant increases in the following award categories:

- Substation Civils
- Balance of plant
- Main Plant framework (switchgear / equipment suppliers)
- Access

Although all categories are fully analysed the following section will focus in more detail on those highlighted and, due to the size of overhead line programme of works, we will include further analysis of this the OHL category.

Focus categories - Gap analysis

Overhead lines

Referring to Fig 7 above, our initial award forecast indicates a C. £12M reduction of year on year OHL awards between T1 and T2. This is not a like for like comparison as we have assumed in T2 we will extract all access works and supply of insulators from the OHL tenders. These components of the work were predominantly awarded under the main OHL contract in T1. Once adjustments are made for this additional our forecasted reduction of awards per annum is only £4M.

As this is still a reduction in average year on year awards then normally we would have confidence in delivering our volumes of works in T2 as higher year on year awards had been awarded and delivered by our suppliers within T1.

However there are a number of critical factors within RIIO-T1 and T2 which need to be considered before making this judgement.

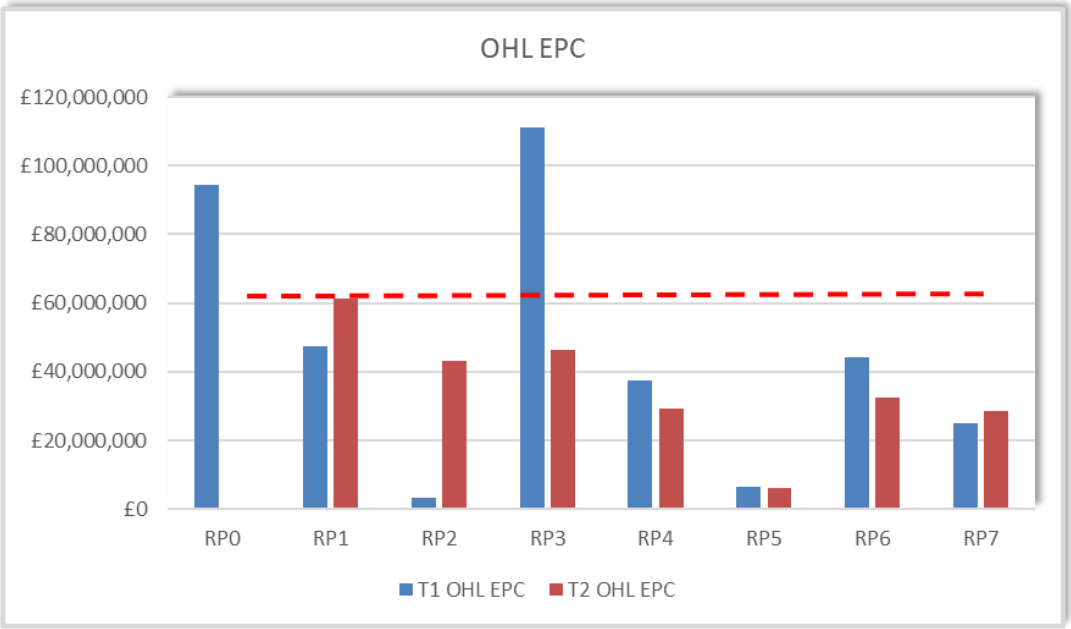


Figure 8: *OHL Regulatory Year on year awards*

As discussed previously SP Transmission were fast tracked for the T1 period. This resulted in the benefit of going to the market in advance of other TOs and allowed us to secure OHL supplier capacity early. This can be seen in Fig 8 above by the high award values in 2012 (RP0) and 2013 (RP1). This market advantage will not be present in T2.

A large OHL contractor did not secure any significant share of OHL works with other TOs through frameworks or tenders and this coincided with our large OHL works requirements for South West Scotland infrastructure expansion; demonstrated by the extremely high 'bundle' of awards in 2015 (RP3) which were predominantly to this supplier.

In addition, our OHL category has been relatively volatile during T1 with many new entrants and recognised suppliers alike withdrawing from the market.

Furthermore, we are aware of a significant increase in the proposed work from other DNOs and TOs during RIIO-ED1 and RIIO-T2 respectively. In general, all steel lattice tower works at 132kv and above may need to be delivered from the same supplier resource pool.

We have worked throughout T1 to bring new entrants into the OHL supply chain and we have had varying degrees of success however latterly this has begun to bear fruit and we now have a relatively new entrant successfully delivering our largest remaining T1 OHL project both to programme and with excellent environmental and stakeholder performance. We are also working with a number of other international suppliers to allow them to satisfy our pre-qualification criteria in readiness to enter our supply chain for the remainder of T1 through into T2.

Currently we have four separate large OHL suppliers working on the final delivery of T1 projects which is healthy position in advance of moving into RIIO-T2 awards.

To ensure that we provide the best opportunities for our OHL suppliers in T2 we have made significant improvement in the flattening of the distribution of awards throughout T2 as can see from Fig 9, an improved profiling from our T1 awards in this category.

In addition, where award lead times dictate, we are working on opportunities for OHL suppliers to bid for both single tenders and bundles of multi-year contracts which would secure longer term order books whilst maintaining full competitive tendering. Through initial discussions with our supply chain, we believe that this will also drive improved quality and project synergies as a result of having confidence to invest in their own staff and subcontracted supply chain. We also anticipate that this may deliver cost efficiency as a result of programme flexibility, reduced site establishment, and an optimum mix of summer and winter working projects.

We continue to expand the works we have done, to ensure that our OHL programme of works is as desirable as possible for our supply chain. However, there is still an underlying concern for the overall capacity of the sector to fulfil the needs of the UK as a whole.

We believe the main restriction of OHL capacity is relating to the availability of skilled and experienced steel tower OHL craftsmen. To identify our needs, we have carried yet further analysis of our projects within the OHL programme of works and have identified, through experience gained in RIIO-T1, T2 OHL squad requirements on quarterly basis.

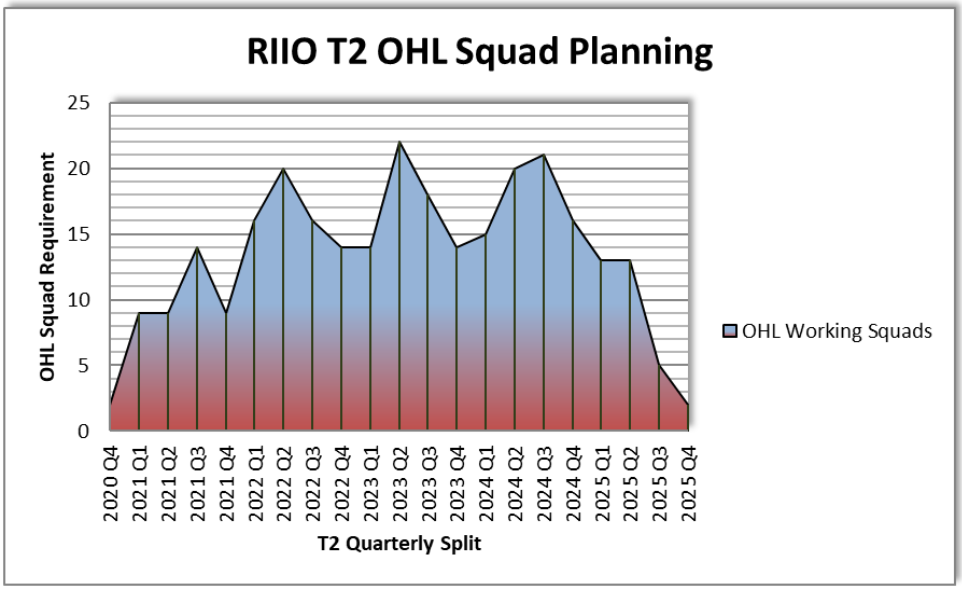


Figure 9: *OHL Squad Histogram*

The above Fig 9 assumes that all outage works will be during summer periods and non-outage works and available during the winter.

We believe that by working with suppliers, looking at ways to secure winter working on the 132 and non-MITS 275/400kv network by reducing Earliest Return to Service (ERTS) we can manage some of the peaks in requirements during the summer months. This exercise will result in a reduction of the peak in requirements from 22 squads (C. 400 linemen) to a steadier ongoing requirement for approximately 18 linemen squads (C. 325 linesmen).

T1 statistics show that during T1 we have peaked at 16 OHL line squads and we have confidence that the works we are undertaking within this category will ensure that the supply chain capacity, capability and market engagement will be sufficient to delivery our overall RIIO-T2 Overhead Lines works as planned.

Substation civils

Referring back to Fig 7 overleaf our initial award forecast indicates a C. £4.5M (32%) increase of year on year Substation Civils awards between T1 and T2.

As result of disaggregation of these works away from embedded within standard switchgear or substation EPC awards we have removed the industry specific requirements for these works (with the exception of safety from the system) and have significantly extended the opportunity for general civils contractors to enter in this market. Competition has been buoyant in this category through the mid to latter part of T1 where disaggregating has been fully implemented.

Some issues regarding new entrants have been encountered with respect to gaining knowledge associated with working in live substation environments and safety for the system however this is no different than historic issues regarding subcontractors working under a previous EPC contractor. Significant support to this sector, through our training schools in Cumbernauld and Hoylake, has been provided to assist in the necessary attainment of the applicable SPEN Safety Authorisations. As stated in our main business plan we continue to invest in these facilities for T2 and beyond.

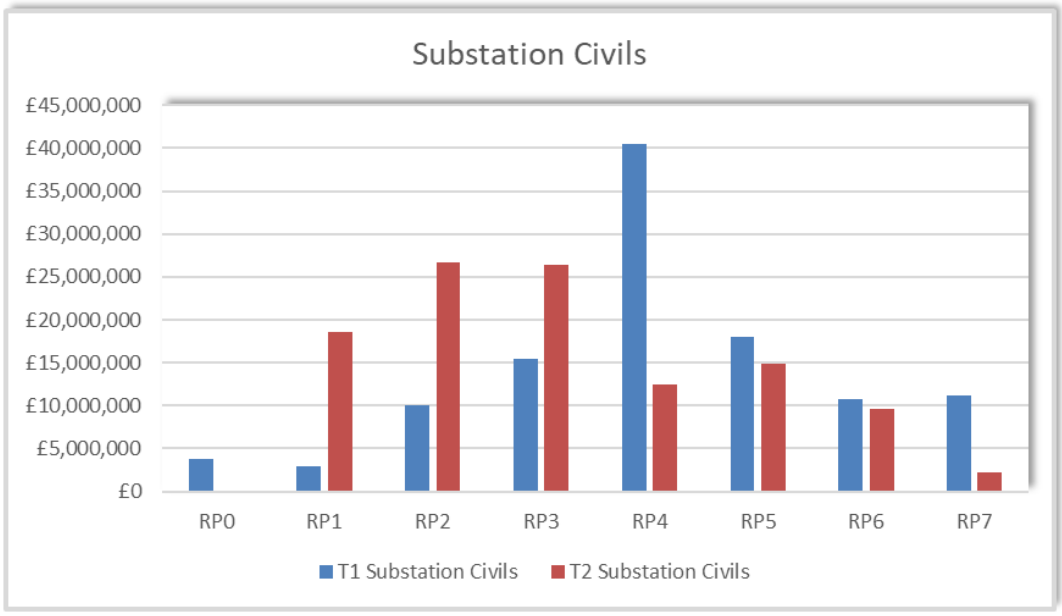


Figure 10: *Substation Civils Regulatory Year on year awards*

Figure 10 above shows a much-improved distribution of awards through T2 with respect to T1. We again believe that this will flatten further due to customer deferrals of some connection works.

Our supply chain questionnaire has indicated that our suppliers in this category are in general exclusive to SPEN with respect to UK transmission works and will not be impacted by other TOs' plans.

We will continue to communicate fully with the sector to monitor any changes however we believe that there is low risk regards capacity or capability in this category to the delivery of our T2 plans.

Balance of plant

Referring back to Fig 8 overleaf our initial award forecast indicates a C. £6.2M (57%) increase of year on year Balance of plant awards between T1 and T2.

Balance of plant is a category where we have experienced some difficulty during T1. This is attributable to a number of factors

- Our historic Pre RIIO-T1 supplier of choice has not been tendering competitively and has temporarily withdrawn from our supply chain
- Manufacturer suppliers do not, in general, want to install switchgear and plant manufactured by others
- BOP is a highly skilled activity which includes the following skills which are difficult to organically grow

  Primary plant installation

  Secondary/ancillary plant installation

  Protection Installation

  Final testing and commissioning
- We have a high level of new entries into this category and higher than average failure rate
- New entries have had limited experience at transmission voltages, or working under UK Transmission codes and have worked predominantly for DNOs or internationally
- There is a significant shortage of experienced and capable commissioning engineers critical for this sector

Despite increasing interest in the category and ongoing competition, one our suppliers has been particularly competitive and as a result has secured over 65% of tenders since 2016. Although they have continued to deliver successfully and to high quality we acknowledge this distribution of awards is a concern.

In addition to the general increase in year on year tenders we can see for Fig 12 below that our distribution of award is not optimal, however as this is due to the awards required in 2023(RP3) for significant multi-year switchgear works in 2024(RP4) through to 2026(RP6) the awards do not model the actual work content.

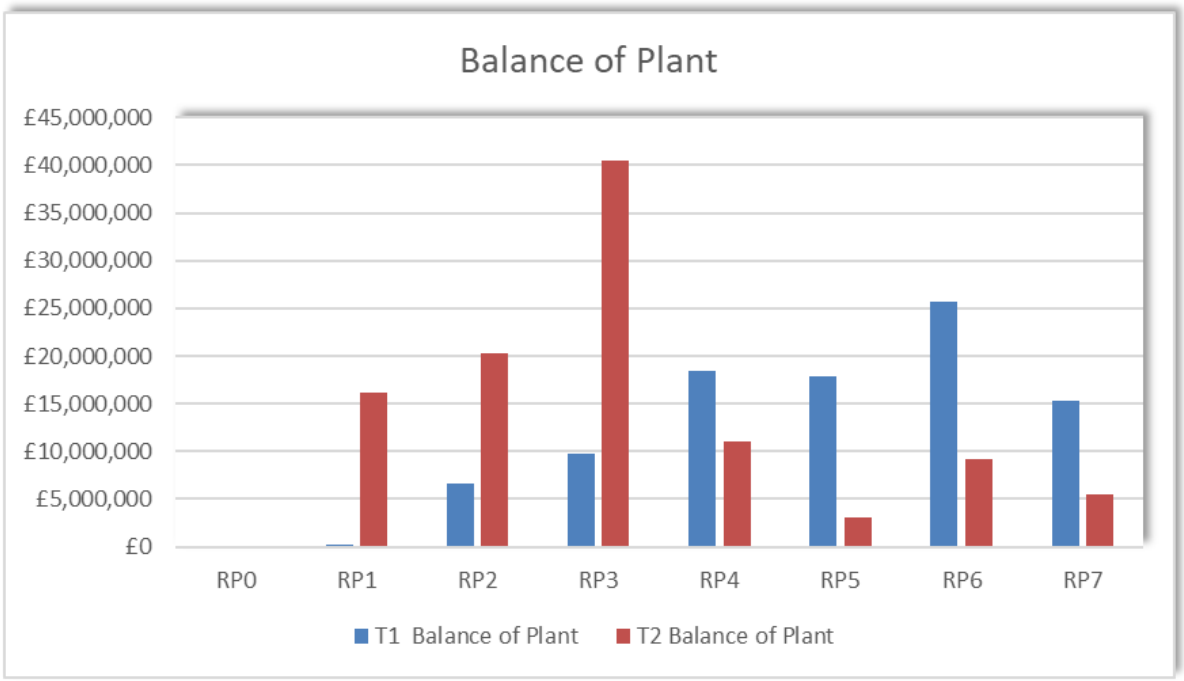


Figure 11: *Balance of Plant Regulatory Year on Year awards*

We are focusing heavily on the growth of our supply chain in this area and will work to increase number of suppliers tendering in this sector. We are currently considering the introduction of a competitively tendered balance of plant framework contract which will service smaller balance of plant works. This will secure a pipeline of works for the successful

supplier(s) alongside limiting the workload associated with the tendering process for these smaller works. All significant value works will continue to be tendered separately.

Our works to broaden our award distribution for Balance of plant works will be carefully co-ordinated to avoid short term detriment to our main supplier(s) who have delivered so well for us in T1.

Main plant framework

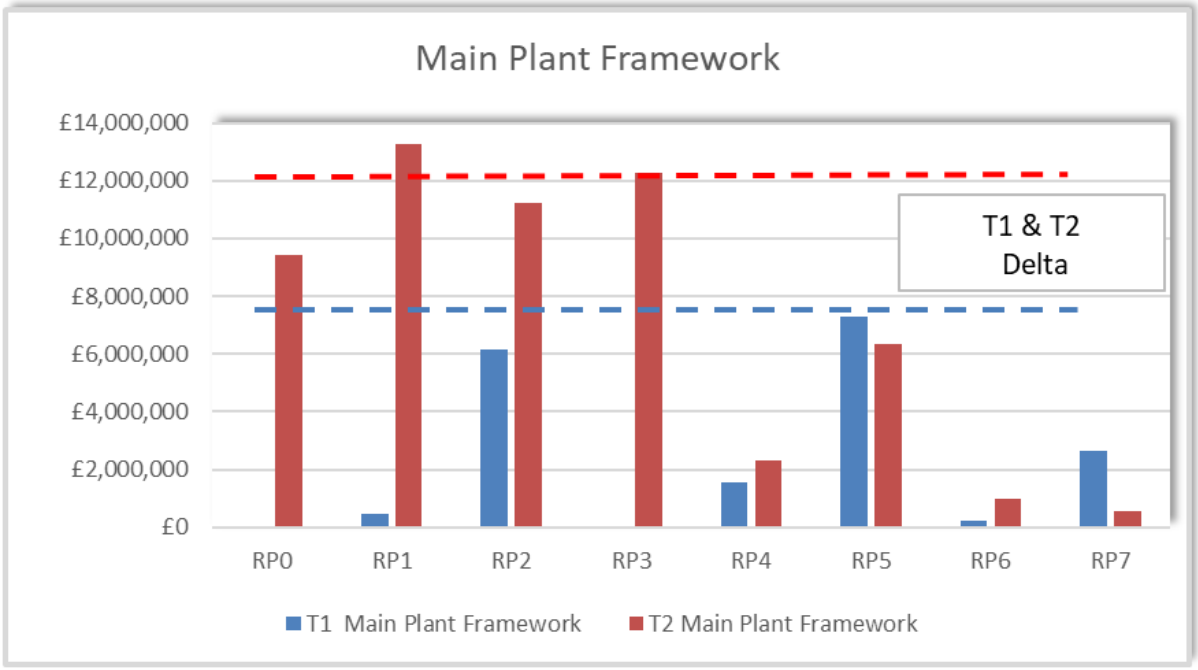


Figure 12: *Main Plant Framework Usage Year on Year*

Main plant category incorporates all free issue plant associated with substation and switchgear projects. This excludes items such as power transformers, reactors, statcoms etc. which are tendered separately due to their individual component value and relatively bespoke specifications.

Main plant items are awarded under a suite of frameworks; these components are high volume and relatively low value items which fit with our framework criteria. This not only allows us to drive efficiencies of scale by aggregating our global needs through the Iberdrola group but also secures the associated switchgear and plant manufacturer's specifications for a pre-determined period, allowing us to design our plant and switchgear works to a mature state, at the earliest possible opportunity but also replicate design over different projects.

Fig 12 shows a significant increase in year on year awards under this framework and although we believe this to be accurate for current T2 projects there is a reduced confidence in the T1 data available due to the global nature of the data associated with frame awards and usage; making direct comparison between T1 and T2 problematic. Irrespective of this, due to the global nature of frameworks, the anticipated increase will easily be accommodated. Risk around this sector is predominantly around wider political and international instability and cost assurity.

Potential changes to tariffs and difficulties with import logistics caused by Brexit lead us to continue to monitor the robustness and sustainability of this critical supply category throughout T2 and beyond.

Access Roads

We have paid particular attention to the need for the installation of access roads and/or systems to allow us to work on our assets. These works are predominantly temporary requirements for the duration of our works with a smaller component associated with enduring access requirements to new substations. Temporary access is almost exclusive to overhead line projects due to their remote nature. Access requirements vary by locality but, in general, contribute approximately 15-20% to the overall costs of works on overhead lines.

With the exception of a single project in T1 access works have been delivered as part of the main OHL contract for the following reasons.

- Alignment of project risks and liabilities
- Alignment of actual access design with ‘fit for purpose’ design
- Inability to extract full value of disaggregation due duplication of method related charges
- Ensuring commercial advantage through reduction of use aggregates
- Significant increase in sustainability and reduced carbon impact and waste

Installation of access roads and systems is not within the core business of our overhead line suppliers and as such is either directly subcontracted or has been problematic when undertaken by OHL contractors in-house. Furthermore, installation and removal of access roads and/or systems has numerous environmental and ecological risks which are specialist in nature and best undertaken and managed by a supplier with core competency in this sector.

We are currently looking at ways in which we can overcome the historic blockers for disaggregation through different contracting models, further incentives for OHL contractors to reduce their access requirements and ways in which we can treat and re-use aggregates to reduce waste and drive towards a Net Zero Carbon future.

It is presumed that all or significant proportion of RIIO- T2 overhead line works will have access works split away from the main OHL contract. This move is shown by the significant increase in awards for access works as shown below in Figure 13.

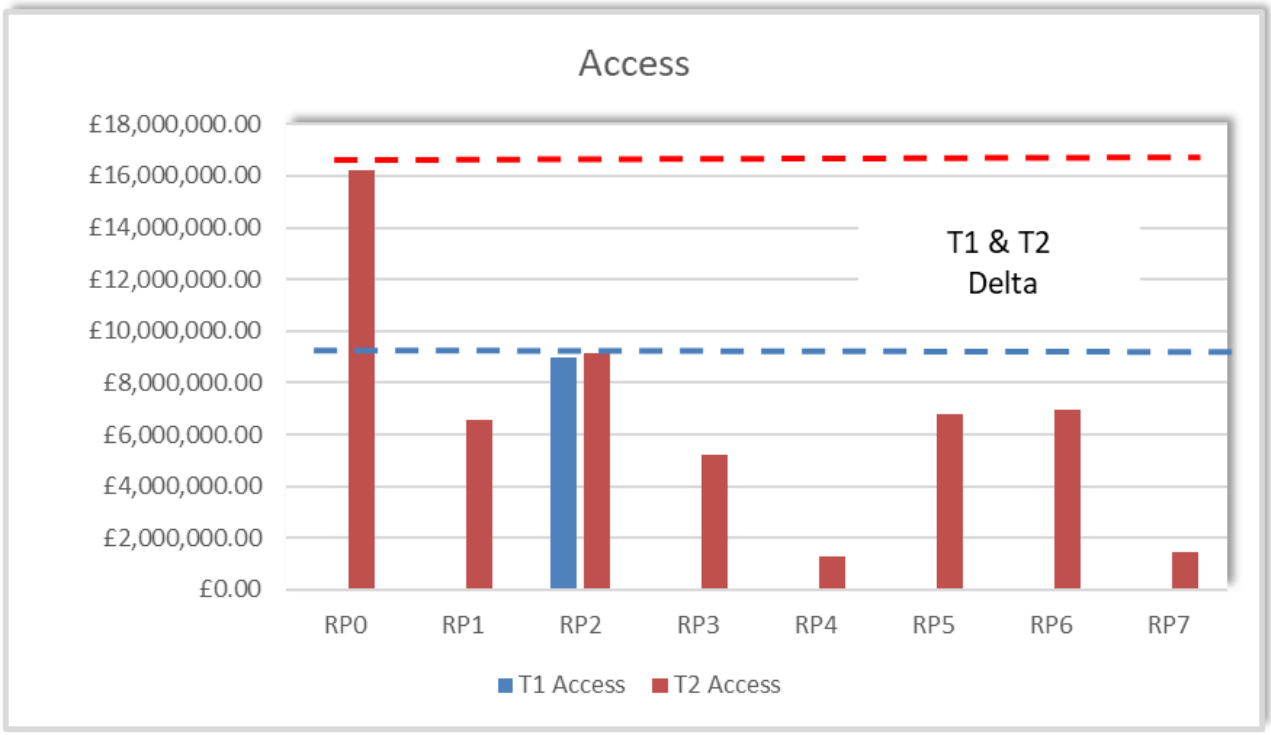


Figure 13: *Access Works regulatory Year on year awards*

Access works suppliers are not industry specific and although additional training and awareness will be required regarding working in proximity to our assets, we have assessed market interest through a recent supplier Request for Information (RFI) and have confidence in gaining both sufficient competition and capacity in this category.

CONCLUSION AND COMMITMENTS

We believe that overall our existing supply chain has the necessary capacity and capability to successfully deliver our RIIO-T2 plans.

We have confirmed an underlying concern regards the overall UK Capacity to deliver all infrastructure works but we believe that the works we have done (and continue to do) to nurture and develop new suppliers into our supply chain or bring international suppliers into the market will fully mitigate these risks.

We have identified our suppliers are at different levels of maturity and resilience.

It is also clear that unless we drive the evolution of all our suppliers from their respective positions the supply chain contribution of the key requirements - carbon management, innovation, sustainability and environment will not deliver the full scope of our ambitions.

To maximise the delivery of key requirements we will ensure senior management accountability for developing the supply chain. This will include the creation of a strategic supply chain management forum.

The table below provides an overview of the how the strategic supply chain management forum will be structured. This strategic activity is complementary to the already well-established supply chain engagements between with our suppliers. The purpose of this additional attention is to provide a forum for us and our Suppliers to focus on specific key agenda items to ensure we deliver on our commitments.

Table 3: *Supply chain management*

Strategic Supply Chain Management	
Supply chain Management Group	**Strategic Focus Agenda**
Stakeholder group Executive Sponsor Supply chain manager Procurement Lead Engineering, Standards and Design Projects Delivery Manager	Carbon Reduction Environmental Sustainability Innovation in Design and Construction Contract routes
Agenda Items	**Engagement**
Baselines Maturity Evolution Performance KPIs Action Plans Benefits tracking	Goal Alignment Bi-lateral meetings held at SP & Supplier Offices/Sites Transparent reporting through dashboards Wider use of media such as Video Conf. Recognition and benefit sharing

To support this, we will continue to:

- Follow up discussions with the supply chain to jointly review their Survey responses
- Jointly agree a maturity baseline for each key requirement
- Develop an action plan focussed on each key requirement, identify achievable goals and incremental continuous improvements steps
- Develop a success supplier dashboard where suppliers can demonstrate and been managed against benefits achieved.

APPENDIX A: HIGH TEMPERATURE LOW SAG CONDUCTOR (HTLS) - CASE HISTORY

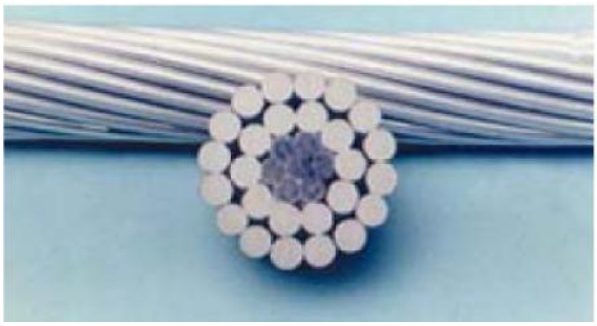
Background

Large centralised generation plants, whose capacity is known from the outset, often take decades to plan and build allowing the Transmission Owner sufficient time to plan network reinforcement. The volatility of the wind generation industry presents new challenges to reinforcement; providing sufficient, but not excessive, capacity quickly, efficiently and effectively. By avoiding the construction of a new line, the high capacity offered by high temperature low sag conductor (HTLS) technology has proved a valuable tool in enabling us to address these challenges and facilitate renewable generation. Implementing the use this new technology will cultivate confidence and progress it toward business as usual.

HTLS conductor systems have been installed in the UK previously however the construction types used within the UK to date have been be subject to numerous technical issues both during installation and service.

A UK First

3M developed a suite of conductors systems which introduced the next generation of HTLS Conductors. All HTLS conductors systems require the use of innovative alternative designs or components to provide the additional tensile strength required for the conductor assembly to function at higher temperatures. The innovative characteristic of the ACCR conductor system is an aluminium matrix ‘composite’ core that provides similar strength to steel but is considerably lighter and its material and physical characteristics do not alter significantly as temperature increases.



3M ACCR HTLS Conductor

The ACCR type of conductor is designed to deliver approximately double the standard transfer capacity on existing structures without requiring major strengthening of the tower steelwork or foundations. This is achieved by a composite core stranded from wires of high purity aluminium reinforced with alumina fibres offering high tensile strength without additional weight. The outer conductor strands are manufactured from hardened (annealed) aluminium zirconium alloy to allow operation at higher temperature.

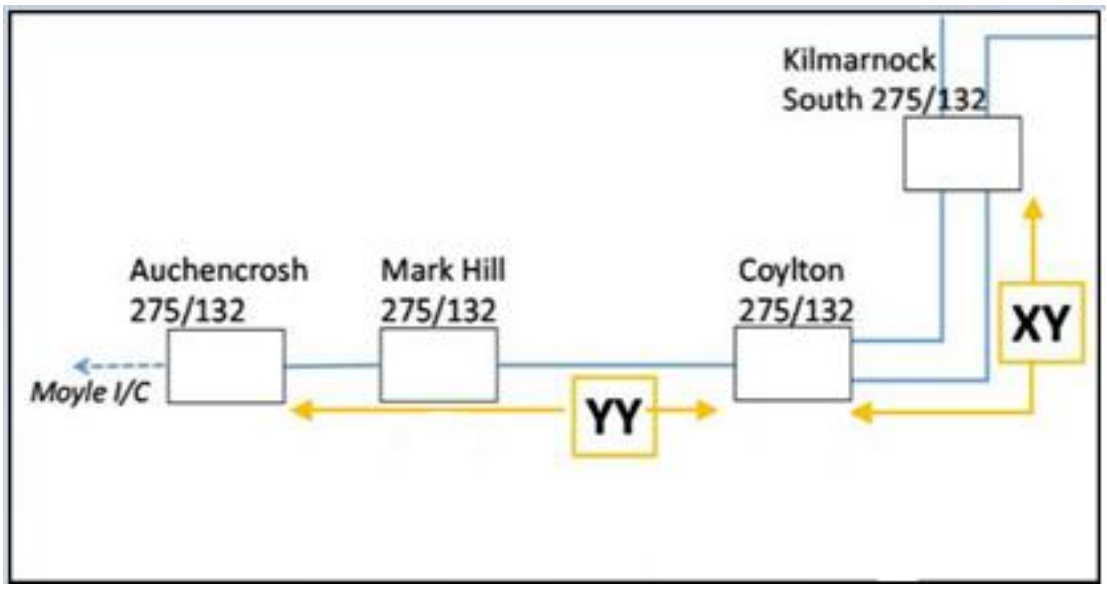
The ACCR conductor systems construction resulted in the installation; although different and more technically challenging than standard conductor, being significantly less problematic that HTLS systems used previously. This de-risked installation concerns but critically reduced outage requirements for installation, minimizing any loss of operation or capacity restriction on the affected network.

ACCR conductor had been used in numerous locations around the world, had been type tested in the UK but had never been installed and utilized on the live network within the UK.

We were successful in securing £27.13M of funding through the Innovation Roll-out Mechanism (IRM) in RIIO-T1, by committing to incorporate this technology on two critical 275kv Circuits:

Coylton to Mark Hill, 49.5km single-circuit (known as the YY Route), and

Kilmarnock South to Coylton, 15.5km double-circuit (known as the XY Route)



XY and YY network representation

The lightweight conductor avoided major tower reinforcement/rebuilding work and provided significant capacity to facilitate the connection of significant low carbon onshore wind generation at lower costs much earlier than conventional means.

Cost Benefits

It is estimated that the overall cost of providing the same capacity increase as detailed below through conventional means would have resulted in costs in excess of £100M (as opposed to actual cost of £44.4M)

YY Route from 504MVA to 924MVA and

XY Route from 640MVA to 1600MVA.

Notwithstanding the above saving brought about by the use of ACCR as opposed to conventional OHL construction, the use of ACCR as opposed to other HTLS systems significantly reduced installation durations and any associated network constraint cost associated with the required network outages.

Stakeholder Benefits

The capacity increases would only have been possible conventionally through the establishment of new tower lines delayed the availability of this network the connection of capacity for low carbon generation for up to 10 years. The anticipated delay is informed by the fact that the original YY route construction was subject to public enquiry. Through the use of ACCR HTLS this difficult and protracted process for the local community and all involved was negated.

Environmental Benefits

The removal of the need for the construction new overhead line has had significant environmental and sustainability benefits.

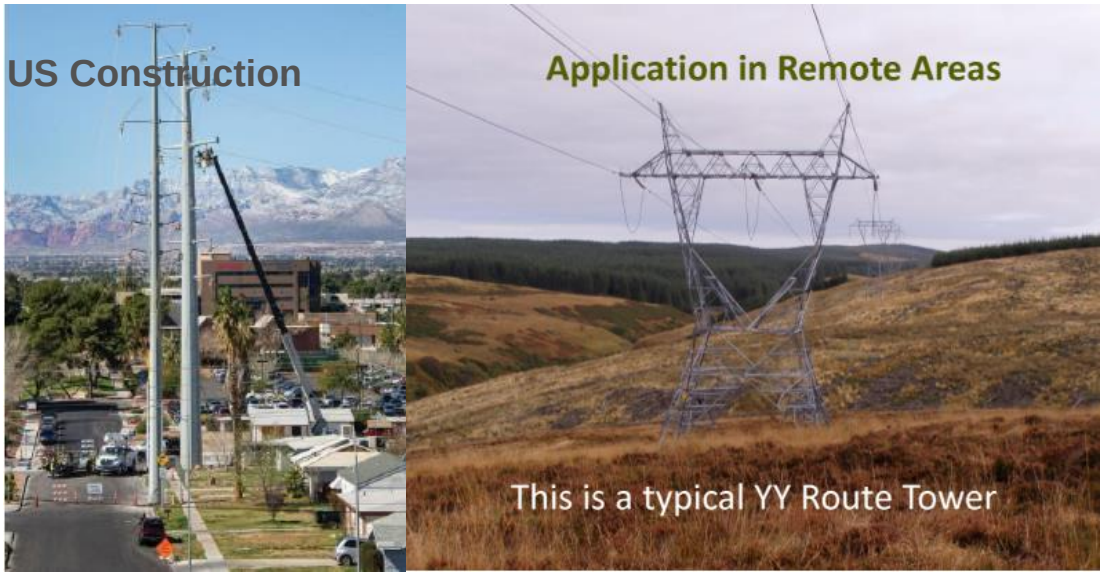
Not only would was the impact on the local environment and ecosystems significantly reduced but the also the removal of the carbon cost of the construction of 44 single circuit towers and 150 double circuit towers which includes:

- Reduction of over 4,000 tonnes of steelwork
- Reduction of over 8,500 tonnes of concrete

Installation Challenges

These new conductor systems had never been installed within the UK and had unique installation requirements necessary to maintain the integrity of the conductor characteristics. Our UK installers did not have the necessary skills and experience without significant specialist upskilling. Furthermore, examples of installation localities and methodology from the US, provided by the manufacturer 3M, highlighted that similar methodology would not be possible.

In general, previous installations had either been on bespoke towers or had been on US style steel poles in relatively unchallenging environments using large Mechanical elevated Working platforms (MEWPs). We needed to install these systems on existing towers within significantly remote and undulating localities where the use of the typical US equipment and methodology was unsuitable. We also identified the need, where possible, to use plant and equipment which was recognizable to the operatives and common within the UK.



Differences in Installation Environments

As a result, a revised installation methodology was developed in conjunction with 3M and re-training; jointly delivered by SPT and 3M established. The hire of the National Grid Training Centre at Eakring was arranged to facilitate this. This centre has been the main NGC overhead line training facility for over 20 years and provided a safe and accessible training facility supported by NGC.

The training covered 4 specific areas as detailed below.

General Training - to familiarise stakeholders has been developed and delivered in a series of informal presentations from the conductor manufacturer.

Full System Installation Training - This type of training will be aimed at the key parties directly involved in the installation of the conductor system and for representatives of the relevant SPT Maintenance teams.

Key Component Competence Training - Repetitive refresh training to be carried out by the installer immediately in advance of installation works (Not specifically at the Eakring facility)

Project and conductor system awareness - A general education presentation explains the new ACCR system, should be cascaded to parties indirectly involved with the installation contract or with the future operation and maintenance of the conductor system.

Case History Summary

This case history is an example of the works SPEN has carried out previously and will continually to undertake as necessary to ensure we work alongside our suppliers and installers to develop the skill necessary to drive maximum use of available innovation in our day to day activities. This exercise has not only upskilled two of our major OHL contractors in readiness for the ongoing use of 3M HTLS but embedded these skills for the wider industry. We now have a mature and effective training regime ready to roll out to any new installers of this system.

Headline benefits are:

- Reduced impact on stakeholders and communities
- Excess of £55m Savings
- Reduction of 4,000 tonnes of steelwork
- Reduction of over 8,500 tonnes of concrete
- Significant reduction in network depletions and associated constraint costs

HTLS conductor installation plays an important part of our T2 plans, providing a method of delivering a better future quicker in a cost effective and more sustainable manner.