

**Demonstrating efficiency of
costs in delivering
transmission capital
investment projects**

Demonstrating efficiency of costs in delivering transmission capital investment projects

This report has been prepared as part of the submission to Ofgem in respect of the RIIO-T1 Price Control. As part of that review, Ofgem has raised the question of how Scottish Hydro Electric Transmission Ltd (SHETL) can demonstrate cost efficiency.

This document outlines SHETL's approach to ensuring cost efficiency in the delivery of SHETL's capital investment programme.

Regardless of the RIIO-T1 review process, SHETL has an ethos of continuous improvement and of finding, adopting and implementing best practice for the business, and of regularly benchmarking that practice.

This document is made up of the following sections:

- Business Objectives;
- Organisation;
- Governance;
- Base capital programmes;
- The investment management process and capture of cost efficiencies;
- Cost bases;
- Procurement for transmission capital investment projects; and
- Business plans and initiatives to deliver cost efficiency.

Business Objectives

SHETL is a wholly owned subsidiary of the SSE Group. We maintain operational and managerial independence from the SSE Group, but share common principles and values with it.

SSE has performed well and consistently over a sustained period. SSE recognises that the environment in which the industry operates is ever changing and, to continue to build on this success, it needs to be able to respond to these changes, both in the short and long-term. SSE continually reviews its aims and strategy to ensure that they are appropriate to the business environment, while ensuring it builds on current effectiveness and drives continuous improvement in everything it does. SSE has recently revised its goals in a number of areas and established a clear aim and core purpose which sets the direction for the Group, its businesses and for SHETL.

SHETL has long been recognised as being a prudent, efficient and effective network operator. SSE recognises the particular step change in investment required in its transmission business over the next decade. The key goal for SHETL and our sister distribution businesses (Scottish Hydro Electric Power Distribution and Southern Electric Power Distribution) is to be „Smarter' in what we do, with the objective of becoming the most efficient, responsive and



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innovative network operator. This applies directly to how we invest in, develop and build our network, and also to the way we operate and maintain the network, with appropriate support throughout our supply chain.

Underpinning our goals is the commitment to the fundamental ways in which we conduct our business. These are represented across the organisation as the SSESET of values to which all areas of the business are focussed. These values are:

SAFETY – We believe all accidents are preventable, so we do everything safely and responsibly or not at all.

SERVICE – We give our customers service we are proud of and make commitments that we deliver.

EFFICIENCY – We keep things simple, do the work that adds value and avoid wasting money, materials, energy or time.

SUSTAINABILITY – We operate ethically, taking the long-term view to achieve growth while safeguarding the environment.

EXCELLENCE – We strive to get better, smarter and more innovative and be the best in everything we do.

TEAMWORK – We support and value our colleagues and enjoy working together in an open and honest way.

These values are key to ensuring the business focus is clear to all and the values in efficiency and effectiveness in particular are fundamental to SHETL in ensuring we deliver our regulatory obligations and aspirations which are critical to our success.

For SHETL, there is a passion and focus on business initiatives and plans that support the realisation of these values and goals. We recognise that there remain opportunities for continuous improvement through the RIIO-T1 period. The latter part of this paper describes in more detail some of the key initiatives for our transmission business to continue to develop value in everything we do and ensure that our processes are as robust and efficient as they can be to benefit SHETL and its customers.

We recognise that Innovation, along with associated incentives and outputs, is at the heart of the new regulatory framework. This is an area that we embrace as a business and are committed to realising effective, efficient and economic innovative solutions that address the challenges ahead. Our Innovation strategy provides an important element in the preparation of our proposals.

We also recognise the importance of harnessing innovation to drive improvements and deliver value across our investment portfolio and efficiency in our



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processes and operations. Research and Development (R&D) is the first stage in the innovation chain when new processes, services, products and technologies are generated and developed. The majority of basic R&D is undertaken by academics and research institutes and is funded by research councils with public money. However, as the party responsible for deployment of the new process, service, product or technology, SHETL actively engages at the development stage and brings forward R&D projects into the Strategic and Applied R&D stages taking the innovation into full deployment.

While SHETL has been successful in driving cost efficiencies to date, the focus in the future will very much be about continuous improvement and delivering value through the whole lifecycle of costs. In achieving this, the alignment of strategy, goals and business plans, underpinned by our values, must be closely monitored and effectively managed. To this end, a review of the organisational structure was a critical and integral requirement given the step change in the business, and this is further explained below. It is important to establish clear governance and clear accountability for delivery of the plan. The realignment of the Management Board arrangements at a corporate level also provides a focussed forum of challenge, monitoring and measurement of sustained continuous improvement and outputs.

The RIIO-T1 period through to 2021 will be a challenging one for SHETL, and we look forward to embracing those challenges in order to continue to deliver best value to our customers. This is especially relevant in the cost efficient and timely delivery of our capital investment programme.

Organisation

The new transmission organisation has been specifically designed to deliver a number of key objectives, which include:

- anticipating the deliverables of RIIO-T1 and ensuring that SHETL performs against the output measures;
- timely and cost-effective delivery of an extensive capital programme;
- implementing best in class business practice;
- assigning clear responsibility, accountability and business focus on all aspects of the regulated business; and
- delivering an efficient cost organisation by utilising the synergies of our transmission and distribution businesses.

SHETL's transmission business is clearly set to see radical change in response to the challenge of growth in renewable generation. The articulation of this growth in the RIIO Business Plan, and the continued



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focus on capital project delivery were drivers for our recent changes to the structure of the Transmission business. This reorganisation has brought together, under the Director of Transmission, the delivery of the large capital transmission projects and the broader programme of base load and non-load related capex programmes.

This reorganisation is designed to ensure that all aspects of the licensed business, including the commitments and outputs within the RIIO settlement, will be integrated and delivered under a focussed management team. The focus will be on all aspects of the business, including continuous business improvement and ensuring cost efficiency pressures are maintained during this period of change.

Our transmission and distribution businesses will continue to work closely together in order to deliver the benefits of developing and sharing best practice and synergies in operation, innovation, customer service and stakeholder engagement initiatives.

Governance

The Director of Transmission reports to the Managing Director, Networks who in turn is a member of the SSE Management Board and the Scottish and Southern Energy Power Distribution (SSEPD) Board

(responsible for our transmission and distribution businesses). The Director of Distribution also reports to the Managing Director, Networks.

The SSE Management Board is responsible for implementing the strategy and policy as agreed by the group SSE Board. The Management Board's objective is to ensure the delivery of the SSE key goal for SHETL to be "Smarter", with the objective of becoming the most efficient, responsive and innovative network operator.

The SSEPD Board is responsible for the operational management of the transmission and distribution businesses. Its members include the Managing Director Networks and the Group Finance Director, who are both members of the Management Board; and the Directors of Transmission and Distribution. Collectively they provide a strong and experienced body to direct, monitor and control the efficient operation of the transmission business, including maintaining tight controls over operational and capital expenditure and ensuring effective delivery of capital investment.

Project governance principles

The Large Capital Project (LCP) Governance Framework was introduced to the SSE Group in late 2010, in response to the growing portfolio of large



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capital projects across the Group, including the significant prospective „wider works’ projects in the Transmission business.

The principles of the LCP Governance Framework include:

- the framework has been designed on the basis of people engagement, teamwork, knowledge sharing and continual improvement amongst project delivery groups and teams;
- the framework is phased with six gates (0-5) at appropriate decision points, with clear and consistent deliverables for each gate; and
- project governance rules are established and defined for each phase, with standard project organisational structures and key roles.

Project capital investment appraisal is determined for key phases, with monitoring of project costs and efficiency. The purpose of the Large Capital Project Governance Framework is to ensure that all large investment projects for the SSE Group are governed, developed, approved and executed in a consistent and effective manner, with consideration of best practice in project delivery. Our goal is safe, sustainable and timely execution of our large capital project portfolio, delivering projects and system capacity in line with the requirements of system users and approved business plans.

The framework has been designed for use on all major projects, and is mandatory for all projects with a value greater than £50 million across all business units. Projects of lower value will be subject to a level of governance consistent with the framework and appropriate to the value, complexity and level of risk.

The framework maps what is required to manage projects across their life cycles from development to operation. It is not a detailed technical manual on specifics of project execution; as this is provided by SHETL’s standards, procedures and work instructions.

The LCP Governance Framework manual is supported by a comprehensive suite of policies and procedures that have been specifically designed to support the best practice governance principles. The LCP Governance Framework is subject to constant review and to external audits to test its suitability. A key part of the approach is for continuous review to ensure alignment with business plans and customer and stakeholder requirements.

The Framework and successful project delivery rely upon the integrated input of individuals and teams across the organisation and project lifecycle. To support the approach, a competency profile has been developed for all the key functions and detailed



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training and development plans are being implemented.

The capital base transmission projects are generally of a lower value, but with higher volumes, and we have accepted that all lower value projects adopt the principles of the governance framework consistent with group-wide best practice. The application of the principles to the base capex projects is described below.

Accountabilities for individuals in the process of planning and project development are specified within both the LCP Governance Framework manual and the financial control document 'Control of Operational Capital Investment in Engineering Schemes'. These are reinforced in the objectives of individuals in the annual setting and review of role and personal objectives, to provide a clear statement of the roles and responsibilities of all of the internal stakeholders involved in efficient and effective project development and delivery.

Base capital programmes

This section provides an outline of the drivers for the different programmes of work within the base capital programme, in order to differentiate their drivers and

approach. The control of the projects within each of these programmes is described below.

Load-related expenditure

There are two key drivers for load related investment in the transmission system. The first is to ensure that the network is of adequate capacity in respect of growth in demand and generation, and as such is compliant with regulatory and statutory obligations. The second is to meet the needs of new demand and generation customers requiring connection and access to the transmission system.

Non load-related expenditure

Non load-related expenditure relates to maintaining the health, condition and performance of the overall asset groups. The SSEPD Asset Management policy is focused on making decisions based upon gathered information from the network operation and condition of its assets. The strategy aims to ensure that:

The performance of the electricity transmission network will be 'safe and reliable'

and

The electricity transmission network will be 'fit for purpose'.

This is achieved by having an asset management system that reviews asset condition, risk analysis,



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operational performance and fault rates. Acting upon this information, the asset management procedures direct the appropriate actions to be taken and thus establish the needs case for investment.

Asset replacement is not always like-for-like; refurbishment options and network rationalisation and development are considered where appropriate. End of life replacement is derived from the results of an 'on site' condition assessment, statements of condition are gathered and then dealt with through specific procedures in the asset management system.

Connections

The key driver for transmission connection investment is for renewable generation connecting either directly to the transmission system or to the distribution network, and whereby grid substation upgrades are necessary.

It is important to recognise that customer choice is a real driver of efficiency in design and competition in the market. Renewable developers will exercise choice for a single non-firm circuit where they believe that the reduced timescales for planning consent will outweigh the project benefits of a firm double-circuit arrangement. On the same basis, developers have opted for sections of the circuit to be established as underground cables, in preference to an overhead line alternative, and paying the cost difference.

As connection sole-use work is contestable, there is a strong market test of the cost efficiency of the design, costing and timescale of the connection offered by the licensee.

Design and pre-construction work

The total portfolio of possible transmission projects required as a result of the prospective generation for the wider works and the shared infrastructure projects is some £6-7bn. Our experience is that between 1% and 4% of project costs are spent during the development phase. This is based on our research of global best practice. Design and pre-construction works for this portfolio of projects is forecast to be some £90 million within the RIIO period. These costs represent 2% of the total costs, and are proportionate to the overall costs.

The objective of the design and pre-construction phase is to develop a project from initial conception to a well designed and developed project. The output of this project phase is to have a clear and settled understanding of all aspects of the overall project. These aspects include scope of work, selection of best options, technology selection, procurement strategies, environmental assessments including land/marine surveys, planning consents and wayleaves. Key outputs are a firm understanding of



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duration and completion dates, project risks and confidence of costs.

Cost efficiency

The above sections provide an outline of the drivers for the different programmes of work within the base capital programmes:

- load-related investment;
- non load-related investment;
- connections; and
- design and pre-construction work.

For each programme there are not only different drivers, but different approaches to ensuring cost efficiency such that these are proportionate to the size of the schemes. The management organisation and the process for investment management for these programmes aim to ensure that investment decisions are sound, with efficiency in all aspects of project development and delivery, and that projects are managed and delivered to time and to budget.

The investment management process and capture of cost efficiencies

Within SHETL, the capital investment process embodies the following aims:

- scope, design and develop, and understand the risks of projects prior to construction commencement
- deliver projects to time and budget
- ensure cost efficiency in all aspects and stages for each project.

The essence of this approach is to 'do the right thing, at the right time, for the right price'.

Our goal is safe, sustainable and timely execution of our capital project portfolio, delivering projects and system capacity in line with the requirements of system users. The capital base transmission projects are generally of a lower value, but with higher volumes, and we have adopted the position that all base capex projects should adopt the principles of the governance framework.

It is standard practice that any efficient investment commitment will only be made after the cost and timescales to deliver a project are known, and cost efficiency is fully challenged and ascertained.

To achieve certainty in cost and timeline of a project, the Investment Management process is based on a 'customer and delivery' relationship in which the ownership of the project is vested in an investment manager, acting as the asset owner and customer.



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The delivery team typically comprises a design project manager, a delivery project manager, procurement staff, network operations, consent officers, a financial controller and health and safety staff, all with a resolve to meet the three key aims. This customer/delivery relationship operates in a 'commitment based management' framework which includes signature practices such as investment reviews, risks and opportunities meetings, and project process redesign. These are regularly and rigorously conducted to ensure a project remains on track and to capture best practices and ideas across the business.

Details of the investment management process

SHETL's internal investment management process for transmission base capital projects follows a structured gate framework. The following paragraphs outline the steps that must be completed in order for a project to pass through each gate.

Pre-Gate 0 – Project conception

This initial stage involves the investment manager, as customer/asset owner, identifying the need for a capital project and outlining a high level technical solution. The requirement for the project will be identified by monitoring and analysing the condition and criticality of assets and the performance and

capability of the system. It will be based on one or more of the following:

- ensure compliance with licence and statutory obligations
- provide "fit for purpose" asset performance and/or
- accommodate a new user of the network

A technical justification paper will detail various options to meet the needs of the network, a high-level cost estimate of the various options and a recommendation of an efficient and technically sound solution. The functional specification of the capital assets and the system outputs are determined at this stage.

Pre-Gate 1 – Scope of works

At this stage, the scope of works is developed and agreed. The investment manager involves various delivery parties and stakeholders such as the design project manager, the delivery project manager, procurement, field unit staff and network operation staff, and others as appropriate to establish the scope of works and a revised high-level cost estimate.

Feedback to the investment manager from this team ensures that the high level objectives of functional specification, outputs and cost are deliverable. Any adjustments to these would be subject to challenge by the investment manager prior to agreement.

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Pre-Gate 2 – Project development

Following agreement on the scope of works, the investment manager/delivery team meetings consider various options to deliver the technical report preferred solution. Each of the options is considered for the practicality of construction and operation, high level cost estimates are prepared and timescales assessed. The overall assessment results in an agreement on the specification of the works, and that the selected project option meets the need case in line with the technical report.

Pre-Gate 3 – Engineering and design

The design project manager completes a detailed design for the prospective project. This covers design of the electrical plant and its layout, protection and communication equipment, civil works, and stage-by-stage design of the construction phases. This stage also designs the requirement for system outages, the procurement of plant, materials and external installation and commissioning services, environmental impacts and mitigation, planning and consenting requirements and identification of risks associated with the project.

The design project manager liaises closely with the delivery project manager on these aspects, establishes project timescales and a further level of detailed costs, and ensures efficiency of delivery is

being built into the project design. Efficiency assessments are made in these design requirements, such that, for example, environmental and safety risks are mitigated, and an appropriate balance is achieved between planning and consenting timescales and costs.

Pre-Gate 4 – Construction

During the construction phase, the project is subject to regular review by the investment manager to ensure that project deliverables, costs and timelines are on target. In addition, the schedule of risks is also reviewed to ensure that all steps are being taken to remove or mitigate risks or to close down addressed risks. If additional costs are needed above the authorised level to mitigate risks, supplementary expenditure authorisation forms are approved, provided the total costs are within the approved budget for the project.

Pre-Gate 5 – Assessment

As a project completes and is taken into operation, we take time to review the project and to provide feedback to the involved parties. The total and final costs are established and a post investment appraisal is carried out to review the project, particularly in the following areas:

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- The validity of the cost estimate through the various stages and gates to learn and reflect learning points for future projects;
- Learning points on contract management, health and safety, project engineering, risks and their mitigation; and
- Review of our procurement approach.

Cost Bases

The costing methodology behind all SHETL's schemes is based around a standard and consistent approach, controlled by a centrally managed function which continually ensures it is informed of all commercial contracts and procurement processes which are underway. This includes tender feedback and framework agreements, as well as other necessary cost sources, to ensure it is constantly able to provide cost data and to benchmark, test and review costs associated with SHETL activities.

The sources for these costs and the associated benchmarking activities include market intelligence from our corporate procurement which constantly monitor and are informed of market trends and rates. SHETL is also able to check its estimates with the input from its various consultants and a level of further scrutiny is applied to cross-check its costs at different stages of a project.

Like other business processes, this costing refinement and updating involves similar processing, review and progression steps in line with the LCP methodology to ensure consistency and accuracy on all estimated costs within each specific project scheme.

Actual project costs are based on a 'bottom up' approach where all the key component parts are identified and, using our market informed 'unit cost' references, the volumes and synergies are evaluated in the activity parts until the full project costs estimate can be established based on this design / model.

Procurement for transmission capital investment projects

Project procurement forms an integral part of the LCP Governance Framework, and SHETL is currently pursuing two particular initiatives:

- developing specific procurement arrangements for three transmission categories: substations, cables and overhead lines; and
- utilising the Group Supplier Relationship Management programme to leverage cost benefit.

Current procedures for base capex projects

SHETL has robust procedures and processes in place to ensure that its capital expenditure is efficiently

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deployed and that it achieves best value in the procurement of goods and services. In accordance with the Utilities Contracts Regulations, much of our purchasing is subject to competitive tendering and, as such, we believe over 80% of the base capital costs have or will be market tested. In SHETL's approach to tendering, it prioritises low cost alongside acceptable quality and reliable deliverability to ensure overall best value in our expenditure.

Framework agreements

As part of this, the business makes use of framework arrangements where appropriate to allow it to develop long-term relationships with its suppliers. Given the limited resource availability within the UK market for transmission construction work and consequential need to compete in the global market to secure the necessary goods and services, SHETL believes the use of framework agreements allows us to work with and procure from international suppliers. This ensures long-term provision of the essential inputs to the business, and results in the business being subject to market forces for much of our procurement.

The business generally uses international contracts for the supply of plant and equipment, with UK based installation contracts for on-site activities. As such, SHETL is in the process of tendering a number of frameworks for implementation, with a contract period

of up to five years; normally based on a three year contract with options between both parties for a further one or two year extension.

With regard to market testing and assessment, the procurement process involves several stages both prior to the placing of any framework contracts and during the period of these frameworks to ensure SHETL is still achieving best value in the supply chain for its investment, and therefore value for money solutions for its customers. A pre-tender selection process is undertaken to test the market, to identify market rates, availability and risk including the use of our access to the Achilles vendor database and assurance systems.

Benchmarking

SHETL employs the services of Purchasing Index Ltd, which is an independent firm specialising in benchmarking activities. A number of utility companies utilise Purchasing Index Ltd, including National Grid. They require each company to submit prices for a large "basket of common goods" on an ongoing basis. This service provides access to their extensive database which is continuously updated as part of their service. This gives SHETL full visibility to market rates such that it can compare its tendered contract prices to both the best price and the average price across all the participating companies. This helps to

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drive lower cost and to strive for the very best deal. The data confirms that SHETL's costs are comparable and that the business is purchasing at the right price.

SHETL also utilises the system to identify best practice, and it also allows SHETL to identify and highlight different treatments of cost.

Tendering

SSE Procurement has adopted a category management approach. Each team member has a category lead role (i.e. transformers or switchgear), which allows them to have a good understanding of the market, as well as current activity and sensitivity. The team has achieved very high savings and significant results due to its relationships.

To assist in ensuring that the business is testing the entire global market for suitable suppliers to maximise supplier benefit, it defines very clear tender evaluation criteria which is provided to all potential suppliers identified using its Achilles registration process. These tender evaluation criteria are utilised at all stages of the procurement process, at pre-qualification (tender selection), and at tender (award criteria), and details how the business is going to score and the weighting it is placing on the various criteria. On completion of the procurement process "debrief letters" are issued which explain how the suppliers achieved in relation to

the defined criteria, allowing them to improve their future submissions. This letter also includes detail of who was the successful tenderer/supplier, in line with the EU procurement requirements.

As part of SHETL's stakeholder engagement programme, it has included representatives of its supply chain in the consultation process in relation to the development of its business plan submission. SHETL believes that including these strategic suppliers in the iterative nature of the process allows them to suitably equip themselves to be able to respond to our procurement requirements. SHETL also provide overviews of regulatory funding to our suppliers to enable them to understand the different approach that regulated businesses require when negotiating terms, prior to schemes being approved for funding by Ofgem.

Business plans and initiatives to deliver cost efficiency

SHETL has designed and implemented a series of business initiatives aimed at improving operational efficiency with the principle goal of assuring certainty in delivery, best value and achievement of desired outcomes as detailed within the business plan. In the past two years, breakthroughs have been achieved with the delivery of the LCP Governance Framework

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and introduction of competency frameworks, including engineering, project and commercial management.

development of the business and captures the softer skills including change and cultural awareness.

SHETL fully understands the magnitude of the growth challenge ahead and, in the last year, has achieved business step-change through the deployment of Project Management Consultancy (PMC), and introduction of integrated project controls to enable detailed assessment, evaluation and reporting on delivery status, variance analysis and corrective action planning.

More recently, SHETL has embarked upon the next stage of business improvement in the pursuit of operational excellence. The business model for transmission encompasses many inter-related improvement initiatives all aimed at enhancing and improving our capability and delivery performance. With the end game of Asset and Network performance at the front of all our planning activities and innovation, we have designed our initiatives to add direct value to our core and critical competencies, and continue to capture key knowledge within our company systems, tools and techniques.

While SHETL's business improvement programme stimulates business performance, the restructuring outlined above also aims to improve the functional

