



Making a positive difference
for energy consumers

Company Secretary
SP Transmission plc
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Date: 16 December 2016

Dear Company Secretary,

Project Direction ref: SPT / Phoenix / 16 December 2016

SP Transmission plc (SPT) submitted the project Phoenix (the Project) in August 2016 to be considered for funding through the Electricity Network Innovation Competition (NIC). In this year's decision¹, we selected the Project² for funding.

This Project Direction contains the terms to be followed by SPT as a condition of the Project receiving funding through the Electricity NIC. It must comply with these terms, which can be found in the Schedule to this Project Direction.

Project direction

Chapter 5 of the Electricity NIC Governance Document³ states that a Project Direction will:

- set out the Project-specific conditions that the Network Licensee (which for this project is SPT) is committing to in accepting funding;
- require the Network Licensee to undertake the Project in accordance with the commitments it has made in the Full Submission. Where appropriate, the Project Direction may therefore include extracts from the Full Submission or refer to specific sections of the Full Submission;
- set out the Approved Amount for the Project, that will form part of the calculation contained in the Funding Direction issued by the Authority under Chapter 7 of the Governance Document;
- set out the Project budget that the Network Licensee must report against and how variances against the Project budget will be reported and approved; and
- set out the mechanism for the Network Licensee receiving the Approved Amount as set out in section 4 of the Funding Direction.

¹ <https://www.ofgem.gov.uk/publications-and-updates/electricity-network-innovation-competition-2016-funding-decision>

² Unless otherwise specified, defined terms in this Project Direction have the meaning given to them in Appendix 1 of the Electricity NIC Governance Document.

³ <https://www.ofgem.gov.uk/publications-and-updates/version-2-1-network-innovation-competition-governance-documents>

These are described for the Project in the Schedule to this Project Direction.

Decision

Provided SPT complies with the Electricity NIC Governance Document and with the Schedule to this Project Direction, the Project is deemed to be an Eligible NIC Project.⁴

This Project Direction constitutes notice pursuant to section 49A (Reasons for decisions) of the Electricity Act 1989.



Geoffrey Randall
Head of RIIO Electricity Transmission
For and on behalf of the Authority

⁴ Eligible NIC Project has the meaning given in definitions of the Electricity Transmission licence.

Schedule to Project Direction

1. TITLE

Project Direction ref: SPT / Phoenix / 16 December 2016.

2. PREAMBLE

This Project Direction is issued by the Gas and Electricity Markets Authority (the "Authority") to SP Transmission plc (the "Funding Licensee") pursuant to the Electricity NIC Governance Document issued pursuant to Part E of Special Condition 3I (Network Innovation Competition) of the Electricity Transmission Licence (the "Licence"). It sets out the terms to be followed in relation to Phoenix (the "Project") as a condition of it being funded under the NIC and the Funding Return Mechanisms.⁵

Unless otherwise specified, defined terms in this Project Direction have the meaning given to them in Appendix 1 of the Electricity NIC Governance Document.

References to specific sections of the Funding Licensee's Full Submission in this Project Direction are, for ease of reference, made by referring to the section number in the Funding Licensee's Full Submission pro-forma.

3. CONDITION PRECEDENT

The Funding Licensee will not access any funds from the Project Bank Account until it has signed contracts with the Project Partners named in Table 1.

Table 1. Project Partners

ABB National Grid Electricity Transmission University of Strathclyde Technical University of Denmark

4. COMPLIANCE

The Funding Licensee must comply with Special Condition 3I of the Licence and with the NIC Governance Document (as may be modified from time to time in accordance with Special Condition 3I and as modified and/or augmented in respect of the Project by this Project Direction) and with this Project Direction.

Any part of the Approved Amounts that the Authority determines not to have been spent in accordance with this Project Direction (or with the Electricity NIC Governance Document) is deemed to be Disallowed Expenditure.

Pursuant to Special Condition 3I.12 of the Licence, Disallowed Expenditure is revenue received (whether by the Funding Licensee or by another Licensee) under the NIC and Funding Return Mechanisms that the Authority determines not to have been spent in accordance with the provisions of the Electricity NIC Governance Document or with those of the relevant Project Direction.

Pursuant to Chapter 8 of the Electricity NIC Governance Document, Disallowed Expenditure includes any funds that must be returned if the Project is halted without Ofgem's permission, any funds that have not been spent in accordance with the approved Project

⁵ The Funding Return Mechanism is defined in part C of Special Condition 3I.

Budget contained within the Project Direction, and any unspent funds on the completion of the Project.

5. APPROVED AMOUNT FOR THE PROJECT

The Approved Amount is **£15,559,482.79**

6. PROJECT BUDGET

The Project Budget is set out in Annex 1 of this Project Direction.

The Funding Licensee will report on expenditure against each line under the category total in the Project Budget, and explain any projected variance against each line total in excess of 5% as part of its detailed report which will be provided, in accordance with Chapter 8 of the Electricity NIC Governance Document. Ofgem will use the reported expenditure and explanation to assess whether the funding has been spent in accordance with the Electricity NIC Governance Document and with this Project Direction.

For the avoidance of doubt this reporting requirement does not change or remove any obligations on the Funding Licensee with respect to reporting that are set out in the Electricity NIC Governance Document.

7. PROJECT IMPLEMENTATION

The Funding Licensee must undertake the Project in accordance with the commitments it has made in the Full Submission approved by the Authority pursuant to the Electricity NIC Governance Document and with the terms of this Project Direction. These include (but are not limited to) the following:

- (i) undertake the Project in accordance with the description set out in Section 2 (Project Description);
- (ii) provide a Network Licensee Compulsory Contribution of £1,764,375.59
- (iii) complete the Project on or before the Project completion date of 31 March 2021; and
- (iv) disseminate the learning from the Project at least to the level described in Section 5 (Knowledge Dissemination).

8. REPORTING

Ofgem may issue guidance (as amended from time to time) about the structure and content of the Project Progress Report required by Chapter 8 of the Electricity NIC Governance Document. The Funding Licensee must follow this guidance in preparing the reports.

As required by Chapter 8 of the Electricity NIC Governance Document, the Funding Licensee must inform the Authority promptly in writing of any event or circumstance likely to affect its ability to deliver the Project as set out in its Full Submission.

9. COST OVERRUNS

The maximum amount of Contingency Funding that the Funding Licensee can request as additional funding for cost overruns on the Project is 5% of the approved amount.⁶

⁶ This is the amount requested by the Funding Licensee in its Full Submission.

10. INTELLECTUAL PROPERTY RIGHTS (“IPR”)

In Section 5 of its Full Submission (Knowledge Dissemination) the Funding Licensee has stated that the Project conforms to the default IPR arrangements set out in Chapter 9 of the Electricity NIC Governance Document. The Funding Licensee must therefore undertake the Project in accordance with the default IPR arrangements.

11. SUCCESSFUL DELIVERY REWARD CRITERIA

The Project will be assessed by the Authority for the purposes of the NIC Successful Delivery Reward against the SDRCs set out in Table 2 below (which comply with Chapter 5 of the Electricity NIC Governance Document).

Table 2. Successful Delivery Reward Criteria

Successful Delivery Reward criterion	Evidence
1) Architecture, Design and Engineering feasibility	
Engineering design and feasibility analysis for pilot H-SC deployment and demonstration. Site selection and planning consent for H-SC installation. Detailed layout, civil designs and approval through system review group for finalising tender for site works and ordering equipment.	<ul style="list-style-type: none"> • Report on engineering and design feasibility analysis. WP1 (01/12/2017). • Report on environmental studies and life cycle analysis. WP1 (01/06/2017). • Report on detailed installation diagrams and site layouts. WP1 (01/08/2017). • Report on routine and type testing procedure and results. WP1 (01/12/2017).
2) Financial Value Evaluation and Regulatory Recommendations	
Develop and demonstrate a commercial framework to financially incentivise services provided by synchronous compensators. Enable service providers to participate in a new market for inertia and other ancillary services provided by SCs. Create recommendations for regulatory considerations for future roll-out of SCs/H-SCs.	<ul style="list-style-type: none"> • Cost benefit analysis model for SCs and H-SCs. WP3 (01/12/2017). • Report on cost benefit analysis of SCs and H-SCs based on system studies and FES. WP3 (01/03/2019). • Report on international application of SCs and benefit analysis. WP3 (01/06/2019). • Report on value evaluation of SCs/H-SCs based on pilot installation and performance. WP3 (01/06/2020). • Report on impact of SCs/H-SCs on existing balancing schemes and markets. WP3 (01/01/2021). • Report on value analysis from roll out of SCs/H-SCs in GB in future potential sites. WP3 (01/01/2021). • Report on regulatory considerations and recommendations for future roll-out of SCs and H-SCs. WP3 (01/12/2020).
3) Control Methods Development and Testing	
Innovative control methods to maximize benefits of SC/H-SC installations in different network conditions and different locations across GB. Simulation of co-ordinated control schemes with other network components such as SVCs, STATCOMS and battery storage. Development and on-site testing of hybrid control scheme for H-SC.	<ul style="list-style-type: none"> • Report on methods and functional specifications of hybrid control mechanisms developed and trialled in pilot demonstration. WP4 (01/06/2017). • Report on output of SCAPP project on protection and control of synchronous compensators and simulation results of new control methods. WP4 (01/06/2018). • Report on performance of pilot hybrid

Successful Delivery Reward criterion	Evidence
	co-ordinated control system. WP4 (01/03/2020, 01/03/2021). <ul style="list-style-type: none"> • Report on methods and functional specifications of innovative control schemes for future roll-out. WP4 (01/12/2017). • Report on FAT test procedure and results of pilot hybrid co-ordinated control system. WP4 (01/06/2019). • Report on SAT test procedure and results of pilot hybrid co-ordinated control system. WP4 (01/10/2019).
4) Lab Functionality and Component Model Testing	
Testing of different operational scenarios in laboratory environment to generate results to better understand performance of SC/H-SCs under various limits and constraint conditions. Lab testing will test different operational parameters of SC/H-SCs. Use of RTDS to facilitate simulation of technical models and control algorithms.	<ul style="list-style-type: none"> • Component model adapted to pilot demonstration and for further system studies. WP5 (01/12/2017). • Report on component level studies from SCAPP project and relevance to pilot demonstration and future installations. WP5 (01/12/2018). • Report on co-simulation for faster prototyping for new designs and controls. WP5 (01/12/2017).
5) Application of synchronous compensators: GB system studies	
System studies using SC/H-SC component model and GB system model developed through EFCC project and SOF studies to critically analyse impact of future roll-out of SC/H-SCs in GB network. Case studies for specific system cases on GB network.	<ul style="list-style-type: none"> • Report on System Studies and Quantification of overall benefits from application of SCs/H-SCs in GB system. WP5 (01/06/2019). • Report on case studies on system characteristics of SCs/H-SCs in conjunction with other innovative solutions proposed through EFCC and HVDC converters. WP5 (01/06/2019). • Report on optimal placement and capacity evaluation of SCs/H-SCs in GB. WP5 (01/03/2020). • GB roadmap for roll-out of SCs/H-SCs. WP5 (01/12/2020).
6) Pilot Installation and Operational Trial	
On-site installation and commissioning of pilot H-SC demonstration. Civil work and electrical connection of H-SC to the transmission network.	<ul style="list-style-type: none"> • Report on site installation process, details and recommendations for future – Civil. WP1 (01/03/2019). • Report on site installation process, details and recommendations for future – Electrical. WP1 (01/10/2018). • Report on SAT procedure and test results. WP1 (01/06/2019). • Report on electrical layout of H-SC design with protection and control architecture. WP1 (01/03/2019). • Report on extended live trial and recommendations for future installations (Revision 01/03/2021).
7) Performance Monitoring	
Monitoring of equipment performance such as losses, vibrations and maintenance requirements of rotating parts of the pilot H-	<ul style="list-style-type: none"> • Report on pilot H-SC installation component level - SC, STATCOM condition monitoring. WP2

Successful Delivery Reward criterion	Evidence
SC. Condition monitoring of the H-SC output and impact on the regional and wider power system.	(01/12/2020). <ul style="list-style-type: none"> • Process documentation for SC type testing requirements for future installations. WP2 (01/12/2019). • Functional specifications for H-SC output monitoring - Methods and User Interface. WP2 (01/06/2018). • Functional specification for H-SC wider system operational performance monitoring. WP2 (01/12/2018). • Report on pilot H-SC installation output data logging and monitoring WP2 (01/01/2021). • Report on H-SC system impact in local and wider system context - Usage, Control methods and Interactions. WP2 (01/01/2021).
8) Knowledge Dissemination	
Stakeholder engagement and dissemination of learnings and outcomes of the pilot H-SC demonstration through project.	<ul style="list-style-type: none"> • Report summarising findings of TO SO working groups. WP6 (01/12/2019). • Report on emerging technical standards for synchronous compensators. WP6 (01/06/2020). • Project Phoenix Close down report. WP6 (01/06/2021). • Project Phoenix regular project progress reports. WP6.

The maximum amount of the Electricity NIC Successful Delivery Reward (which will not exceed the Network Licensee Compulsory Contribution) that the Project will be eligible for is £1,764,375.59.

12. USE OF LOGO

The Funding Licensee and Project Partners, External Funders and Project Supporters⁷ may use the NIC logo for purposes associated with the Project but not use the Ofgem or Ofgem E-Serve logos in any circumstances.

13. AMENDMENT OR REVOCATION

As set out in Chapter 8 of the Electricity NIC Governance Document and this Project Direction, this Project Direction may be amended or revoked under the following circumstances:

- (i) if the Funding Licensee considers that there has been a material change in circumstance that requires a change to the Project Direction, and the Authority agrees; or
- (ii) if Ofgem agrees to provide Contingency Funding, which requires the re-issue of the Project Direction; or
- (iii) if the Funding Licensee applies for Contingency Funding to cover a decrease in Direct Benefits and the Authority decides it would be in the best interest of customers to make changes to the Project Direction before the Contingency Funding would be awarded; or

⁷ As listed in Box 1.6 in Section 1 of the Full Submission pro-forma.

(iv) to reflect amendments made to the Licence.

14. HALTING OF PROJECTS

This Project Direction is subject to the provisions contained in paragraphs Chapter 8 of the Electricity NIC Governance Document relating to the halting of projects. By extension, this Project Direction is subject to any decision by the Authority to halt the Project to which this Project Direction relates and to any subsequent relevant Funding Direction issued by the Authority pursuant to Special Condition 3I.

In the event of the Authority deciding to halt the Project to which this Project Direction relates, the Authority may issue a statement to the Funding Licensee clarifying the effect of that halting decision as regards the status and legal force of the conditions contained in this Direction.

NOW THEREFORE:

In accordance with the powers contained in the Electricity NIC Governance Document issued pursuant to Part E of Special Condition 3I of the Licence the Authority hereby issues this Project Direction to the Funding Licensee in relation to the Project.

This constitutes notice of reasons for the Authority's decision pursuant to section 49A (Reasons for decisions) of the Electricity Act 1989.

ANNEX 1: PROJECT BUDGET

Cost Category	Cost (£)
Labour	
	2,000,250.00
Equipment	
	7,606,000.00
Contractors	
	6,736,804.74
IT	
	0
IPR Costs	
	0
Travel & Expenses	
	200,000.00
Payments to users	
	0
Contingency	
	700,701.19
Decommissioning	
	0
Other	
	400,000.00
Total	17,643,755.93