



Making a positive difference  
for energy consumers

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### **SHE-Transmission Multi-Terminal Test Environment for HVDC Systems– Approval for continued ownership and operation of the facility during RIIO-2**

The Network Innovation Competition (NIC) funds a number of large-scale innovation projects and was set up to encourage network licensees to innovate in the design, development and operation of their networks.<sup>1</sup>

Upon successful application under the NIC, Scottish Hydro Electric-Transmission (SHET), alongside Scottish Power Transmission (SPT), National Grid Electricity Transmission (NGET) and National Grid Electricity System Operator (NGESO) as Project Partners, developed and constructed the HVDC Centre (also called the Multi Terminal Testing Environment centre - MTTE) to enable the planning, development and testing of high voltage direct current (HVDC) transmission solutions in GB. The Centre has operated since it opened in April 2017.

When issuing the direction for the project in 2013 (updated in 2018<sup>2</sup>), we included a requirement on SHET to submit a Notice to the Authority for the future operation of the facility (post NIC funding period) prior to 31st of March 2020. We mentioned that the Notice should explain how the approach taken will maximise future value to all customers (including those of the other transmission licencees). The direction also highlighted that Ofgem will be required to determine whether to approve the Notice, or direct alternative arrangements, no later than six months after this submission.

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<sup>1</sup><https://www.ofgem.gov.uk/publications-and-updates/version-30-network-innovation-competition-governance-documents>

<sup>2</sup>[https://www.ofgem.gov.uk/system/files/docs/2018/03/amendments\\_to\\_the\\_mtte\\_project\\_direction\\_clean\\_publication.pdf](https://www.ofgem.gov.uk/system/files/docs/2018/03/amendments_to_the_mtte_project_direction_clean_publication.pdf)

SHET submitted a Notice setting out their proposals for the future use and funding of the MTTE facility on the 7th of February 2020. The proposal in large included the following:

- SHET should continue to own and operate the facility; and
- Allowance requested for operating the facility: £860k annual running costs, £4.3m total over RIIO-2.

SHET included reference to the HVDC Centre in their RIIO-2 Business Plan<sup>3</sup> (BP) narrative and stated that the operation cost of £4.3m would form part of their request for Closely Associated Indirect (CAI) allowance request. As part of RIIO-2 BP, SHET also requested a reopener to allow expansion of the Centre. These funding matters will be considered as part of our wider RIIO-ET2 review. We will set out our proposals in our upcoming Draft Determinations, with a final decision in the RIIO-2 Final Determination due in December 2020.

### **Our view**

We have assessed the Notice provided by SHET in accordance with our principal objective to protect the interests of existing and future consumers.<sup>4</sup> We have based our assessment of the continued ownership and operation of the centre on:

- 1. The needs case for the HVDC Centre*
- 2. Maximisation of future value to all consumers (including those of other transmission licences)*
- 3. View of stakeholders*
- 4. Confidentiality and Intellectual Property*
- 5. Funding*
- 6. Progress and future scope*

- 1. The needs case for the Centre to continue operation, irrespective of ownership*

We consider that there is sufficient justification to continue the operation of the centre for the RIIO-2 period. Given that HVDC is still in its infancy within the UK, the prospect of emerging network projects, coupled with changing network characteristics, provides a strong case for such a Centre looking at the network as a whole.

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<sup>3</sup> <https://www.ssen-transmission.co.uk/media/3761/a-network-for-net-zero-final-business-plan.pdf>

<sup>4</sup> Section 3A, Electricity Act 1989

We recognise the role the Centre plays in supporting the decarbonisation and net-zero targets, as HVDC transmission is recognised as an efficient method (less transmission losses) for the transfer of power over long distances, therefore making it relevant to the transmission of offshore renewable energy. Our expectation is for HVDC to have a pivotal role in enabling the efficient connection of renewable generation to the electricity system, directly via remote Offshore Transmission Operators or interconnectors.

*2. Maximisation of future value to all customers (including those of the other transmission licensees)*

We are of the view that the role of the Centre improves the integrity and security of the network, as it provides a testing environment where various HVDC schemes and projects can be studied, to anticipate and mitigate against potential risks.

Based on input from stakeholders included in SHET's submission, we note that the Centre has successfully supported projects such as the Caithness-Moray HVDC Project, and we acknowledge that a number of projects are anticipated over the period of RIIO-2 and beyond. With such a volume of new expected developments, we consider that the need for the Centre's services and current scope of activities therefore becomes increasingly important to study and mitigate any associated risks to the reliable operation, control and resilience of the GB network.

A further feature of the Centre, which we consider essential to maximising the Centre's benefits, is the dissemination of knowledge and experience from project outputs in order to facilitate industry collaboration. We understand that knowledge has been passed through meetings with project partners, Forums and conferences, general HVDC training and the OFTO & Renewables Developers Events and expect this to continue.

*3. View of stakeholders involved in the Centre activities and consumers' representatives*

We have reviewed the statements of support from the TOs, ESO, universities, manufacturers and other parties associated with the Centre and its activities. Stakeholders agreed that continued ownership of the Centre by a network company will enable Ofgem to monitor its activities and ensure it continues to provide value for consumers and further support decarbonisation.

We also note that the general perception is that a change of ownership of the Centre at the current moment will not deliver any additional benefit to consumers, particularly due to the disruption in activities that this will cause.

#### *4. Sensitivity of confidentiality and intellectual property*

We accept that knowledge gaps between commercial parties can arise due to confidentiality and intellectual property (IP) restrictions, and this can ultimately limit the exchange of information. As such, we consider the Centre provides a neutral and confidential environment for IP protection, and is important in bridging knowledge gaps between relevant parties and allows for the robust investigations needed to mitigate risks associated with developing HVDC schemes.

Futhermore, we acknowledge the limitations that could be placed on the Centre's scope of activities in the event ownership changes from a transmission licensee/ system operator. This limitation links to issues of confidentiality, both to maintain access to detailed network models and IP commitments to suppliers.

#### *5. Funding of the operation of the Centre*

The funding request of £860K per year during RIIO-2 for operating the Centre was included in the allowance request for operation costs for the RIIO-2 price control period and will be considered as part of the wider RIIO-2 price control funding assessment.

We recognise that the Centre may generate revenues via its operation by providing services to developers and other organisations, including non GB players. We also recognise that in the future there may be circumstances where, subject to Ofgem's approval, the Centre could be sold to another entity, and thus create revenues for SHET. Our conditions regarding the treatment of revenues is included in the Appendix to this decision.

#### *6. Progress against objectives and future scope of Centre activities (2021–26)*

We acknowledge that SHET have met all objectives stated in their original NIC submission, as well as meeting the Successful Delivery Reward Criteria (SDRC) stated in the project direction. Additionally, the business proposal submitted by SHET shows an intent to expand the facility to provide for additional replicas of HVDC equipment within the RIIO-2 period.

A reopener was requested in order to accommodate the cost of a potential expansion of the Centre. This request was also included in SHET RIIO-2 BP submission. Our position on the reopener will be set out as part of the wider RIIO-2 price control funding assessment.

## **Our decision**

Overall, we consider that it is in the best interests for GB consumers for the Centre to continue to operate, as there is a strong case presented for its role in the development of HVDC schemes in GB. We agree with stakeholders, that a change of ownership at this time will be of no additional benefit to consumers, and may in fact prove to be detrimental due to disruptions caused.

We have set out in Appendix 1 to this decision the conditions for the continues ownership and operation of the Facility by SHET.

We hereby decide to approve SHET to continue to own and operate the MTTE facility for the period of RIIO-2 under the conditions as set in the Annex to this decision. SHET will include a proposal for the future operation of the centre following the end of RIIO-2 price control, in their BP proposal for the following price control.

Yours sincerely,

Charlotte Friel  
Head of RIIO Transmission Policy

## **Annex 1: HVDC centre obligations**

This decision is subject to the following conditions:

### **Agreement with the TAB partners**

SHET will agree the Terms of Reference (TOR) for the Technical Advisory Board (TAB) with the NGESO, SPT and NGET before 31<sup>st</sup> of March 2021, to ensure the continuing activity of the Board throughout RIIO-2. Terms of Reference (TOR) may be updated as necessary. The agreed TOR and any subsequent change to it must be submitted to Ofgem once it is in place.

SHET will take steps to allow for a non-network representative to join the TAB from April 2021. This could be either a permanent or a rotating role (representative appointed annually) and should be agreed within the broader TAB collectively.

### **Activities that should continue in the RIIO-2 period:**

SHET must continue to operate the HVDC Centre in accordance with the commitments made in its proposal for future business model of the Centre. These activities include but are not limited to:

1. Provide real-time and offline simulation to support the development and deployment of HVDC shemes.
2. Provide training programmes, for example specialist training courses for GB TOs, ESO, HVDC owners, developers and manufacturers to drive value across all areas of HVDC integration from a more informed stakeholder community.
3. Develop academic engagement projects to address key challenges to integration of HVDC projects into AC grids in collaboration with both the TOs and ESO.
4. Maintain a library of updated off-line and real-time simulation models, including all network components required to support the development and deployment of HVDC equipment. This includes FACTS<sup>5</sup> devices deployed on the GB network, in particular STATCOM<sup>6</sup>s.
5. Maintain models to facilitate system integration studies involving multiple equipment manufacturers whilst preserving Intellectual Property (IP) arrangements.

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<sup>5</sup> Flexible Alternating Current Transmission system

<sup>6</sup> Static Synchronous Compensators

6. Proactively engage with industry groups and GB academic and research institutions to support the development of DC Grids.
7. Continue to manage the HVDC Operators' forum and hold periodic events.
8. Continue to maintain the HVDC website and keep it up to date.
9. Publishing reports into the outcome of project and other analysis activities on the SHET HVDC website (subject to Intellectual Property Rights (IPRs)).
10. Ensure the facility is appropriately resourced.

### **Reporting requirements:**

SHET must report annually on its activities to Ofgem. This will include, but will not be limited to:

- Update on the activities held in the previous year, including but not limited to those listed above (core activities and dissemination);
- Planned activities for the coming year (core activities and dissemination);
- Include any updates on agreements with suppliers;
- Financial report which will include income and expenditure;
- Summary of annual/periodic Technical Advisory Board meetings; and
- Key decisions made by SHET and the rationale for those decisions.

The format and timing of the report will be agreed with Ofgem ahead of, or as part of, the RIGs development process for RIIO-2.

SHET will additionally flag to Ofgem any issues or events which might affect the benefits to be gained from the Centre as set out in its BP proposal submitted to Ofgem in February 2020.

### **Finance:**

SHET must cover all the costs of operating the Centre, providing services such as those mentioned in the list of activities above, activities highlighted in its business proposal and other activities associated with providing services to developers and other organisations.

SHET requested that the core services the Centre provides to the TOs and ESO be funded through the requested baseline allowance. We will set out our consultation position in relation to baseline funding in our upcoming Draft Determinations publication and the final decision in the RIIO-2 Final Determination. Subject to this decision, core services will

include operation of the centre and activities to deliver those projects under the core services and dissemination activities set out within SHET's Future Business Plan.

The additional services that will be provided to the networks and wider industry, will be recharged using the relevant excluded services mechanism as described in the proposal. Expenses incurred to deliver a piece of work (eg travel costs or procurement of required hardware) will be netted-off against the revenue earned from that piece of work. SHET may reinvest revenues into the HVDC Centre where such reinvestment is economic and efficient and will provide benefits to GB consumers. SHET will decide whether such reinvestment is appropriate, and will ensure that the decisions are appropriately justified and auditable. This may also include investment in the future expansion of the Centre, a need indicated in the Company's submission.

Any efficient underspend/overspend of allowances, through delivering both core and additional services will be shared between customers and SHET through the Totex Incentive Mechanism as set for RIIO-2, in line with RIIO principles. This is intended to provide an incentive reward to SHET for the efficient running of the facility and for the risks associated with operating the Centre.

SHET must ensure it is able to provide detailed financial tracking and reporting subject to the ongoing discussions on the RIGs development process.

Any revenues created via IPRs should be shared with consumers or reinvested in the facility subject to commercial arrangements through which the IPR was created.

**The facility will not be commercialised or sold to another party unless agreed with Ofgem. Any net profit from the sale of the facility will be returned in full to consumers.**