

# Scottish Hydro Electric Power Distribution

## Shetland Enduring Solution

DSO Recommendation - Addendum

May 2019





# Purpose of addendum

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This document sets out updates to SHEPD's Recommendation which have arisen since it was shared with Ofgem in November 2018, which we consider are significant and of interest to stakeholders. The section numbering in this document corresponds with references added to SHEPD's original Recommendation document (red script).

# Key updates

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## a. Recommended contribution value

*Applicable throughout document*

Further to refinement of SHEPD's analysis, the recommended contribution value has been updated from the original value of £249m to £251m. This value replaces £249m throughout the Recommendation.

The refinements apply to two of the 'fair value service' contribution elements, Control Services and Losses, as set out in the revised version of original Table 1 (Shetland DSO Recommendation, p.6), below.

Recommendation Table 1: Stacked fair value contribution to a whole system solution

Service	Value of service	Revised values
Year-round control services	£115.6m	£117.5m
Reduced losses	£9.7m	£10.2m
Peak demand support	£123m	(No change) £123m
<b>Total contribution value</b>	<b>£249m</b>	<b>£251m</b>

The revised Control Services and Losses values replace the original recommended contribution values throughout the Recommendation.

## b. Value of savings to consumers identified through Recommendation

*Applicable throughout document*

A direct consequence of the revision to the contribution value noted in Section a is the associated update to the value of savings identified by investing in a transmission link-based solution compared to the best value alternative. The value of savings is updated from c.£145m to c.£143m. £143m replaces £145m throughout the Recommendation.

## c. Engaging stakeholders

*Page 7; Sections 2 and 6.4; applicable throughout document*

Over late 2018 and during 2019 SHEPD has carried out extensive stakeholder engagement across the three Scottish island groups, including with local councils, and all developers that we are aware have expressed interest in or made commitments in relation to connecting to the island transmission links. Our intent in doing so was to raise awareness of the pan-island contribution proposals, recognising the limited time and opportunity available in which to realise the benefits of the proposed contributions. We have engaged with stakeholders with Ofgem's support. A list of stakeholders with whom we have met and shared our contribution proposals is set out below.

Addendum Table 1: Updated stakeholder list

Pan-island	Western Isles	Orkney	Shetland
BEIS Scottish Government	Western Isles Council EdF Forsa Energy	Orkney Islands Council Hoolan Energy DP Energy Aquatera	Shetland Islands Council Peel Energy Statkraft / Energy Isles Viking Energy

In April 2019 we also published a [summary of our Whole System Recommendation](#) on SSEN’s website, outlining the rationale for our approach, methodology and associated proposed contribution values, for Shetland, the Western Isles and Orkney.

SHEPD is continuing to conduct engagement with stakeholders on an ongoing basis, and will be arranging specific engagement on the publication of further information on the Orkney and Western Isles recommended contributions in early summer.

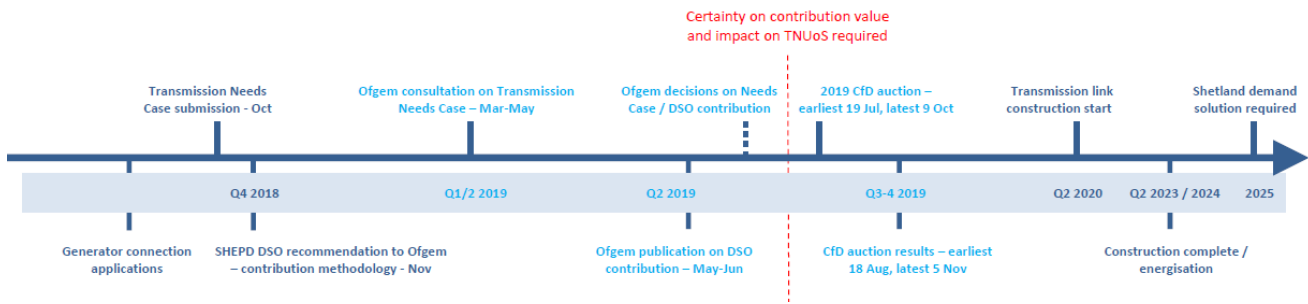
#### d. Programme

*Page 7; section 8; applicable throughout document*

Figure 4 below has been updated to reflect changes to milestones and timing since its inclusion in the original Recommendation. SHEPD notes that the figure reflects SHEPD’s interpretation of required timings of milestones rather than confirmed timings, unless indicated otherwise. The changes are marked in light blue and are summarised as follows:

- [Ofgem’s consultation on the Shetland Transmission link Needs Case](#) was published in March 2019, and will remain open until the end of May 2019.
- Ofgem released its publication on SHEPD’s Recommendation in May 2019, and this will remain open until July 2019.
- The timing of Ofgem’s decisions on the Shetland Transmission link Needs Case and SHEPD Recommendation are not known. SHEPD believes decisions are required before generators bid in the 2019 CfD auction.
- [Detailed timelines for the CfD Allocation Round 3 2019 have now been published](#). These show an earliest bidding date (“sealed bid window” phase) of week 19 to 25 July (assuming no appeals), and a latest bidding date (if appeals) of 9 to 15 October.

Recommendation Figure 4: Indicative forward-looking timeline – updated May 2019 – *Shetland link process*



Recommendation Table 8: Outline regulatory process – updated May 2019 – *Shetland link process*

Activity	Date
SHEPD submission of recommendation to Ofgem	Nov 2018
Ofgem review of recommendation (incl any SQ process)*	Nov 2018 - April 2019
SHEPD potential refinement of recommendation and associated analysis further to Ofgem review	Nov 2018 - April 2019
SHEPD recommendation workshop with Ofgem and consultants	Mid-Nov 2018
SHEPD further BEIS (/Ofgem) engagement on recommendation	Mid-Nov 2018 - May 2019
Ofgem November GEMA board	15/11/2018
Ofgem December GEMA board	13/12/2018
Ofgem minded-to decision on costs / methodology of recommendation for consultation*	May/June 2019
Ofgem minded-to consultation on costs / methodology of recommendation*	May/June 2019
Ofgem review of consultation responses*	June/July 2019
SHEPD potential refinement of recommendation and associated analysis further to Ofgem review of consultation responses	June/July 2019
Ofgem decision on costs / methodology of recommendation*	July 2019
Implementation of contribution methodology - as far as required pre-auction (subject to contribution mechanism); potential refinement of certain assumptions	June/July 2019
Final execution of <b>implementation and</b> DSO contribution arrangements	Late 2019 onwards

Ofgem activities / Ofgem determination of dates and timing  
 SHEPD DSO workstream

## e. Information sharing

*Sections 2.1.7 and 6.4; applicable throughout document*

In our November Recommendation, we set out that “SHEPD has not shared recommendation values or the final proposed mechanism with any third parties” (section 2.1.7). During the intervening period, SHEPD has now shared more detail on its contribution proposals and values for Shetland, Orkney and the Western Isles with island stakeholders, including GB and Scottish Governments, MPs/ MSPs, local councils and developers, through direct engagement on each of the islands and elsewhere as required. Section C above provides more detail on this engagement. On 5 April 2019 SHEPD published its [Whole System publication](#), summarising the principles of its contribution approach, and proposed values for each of the islands.

## f. Security of supply standards

*Section 4.2*

Engineering Recommendation P2 has been in place since the 1950s and has played a major role in the development of secure, reliable distribution networks. In its current guise, as P2/6, the basic philosophy and underpinning economic analysis is unchanged since the introduction of P2/5 in 1978. P2 is a deterministic standard and is largely focused around ensuring sufficient capacity is available to meet the peak demand and that loss of supply is recovered within defined timeframes. P2/7 (Security of Supply), the successor to P2/6, is in the final stages of development. In addition, Engineering Report 130 (Guidance on the application of Engineering Recommendation P2, Security of Supply) is also in the final stages of review and includes a methodology for assessing the economic efficiency of investing in infrastructure in excess of the basic requirements of Engineering Recommendation P2. This methodology is likely to be significant in determining future security of supply arrangements for the island groups.<sup>1</sup>

## g. Contribution range analysis

*Section 6; update to Recommendation contribution analysis*

SHEPD undertook scenario modelling to look at how the impact of changes in the input assumptions affected the contribution value and, specifically, the capacity support value. Such sensitivities included higher and lower consumer demand, different levels of power output from the transmission-connecting wind farms, different costs for the transmission link, and the inclusion of diverse renewable generation such as predictable tidal power. Two key variables are the size of the peak demand on Shetland and the power production of the on-island renewables at low load. Together this will determine the probability that the link meets on island demand in any one year.

### 1. Peak demand

Five scenarios were considered:

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<sup>1</sup> SHEPD proposes to use this methodology to assess the need for distribution assets to meet security of supply on Orkney and the Western Isles.

- Demand of 50MW - Reference Scenario
- Central case from demand forecast produced for 2017 NES
- High case from demand forecast produced for 2017 NES
- Low case from demand forecast produced for 2017 NES
- High-High case, with additional industrial demand spurred by economic development brought by the link.

For the Reference Case the capacity support value is calculated using an island demand of 50MW as a proxy for the anticipated island demand during the life of the link. 50MW was chosen because it is the level of granularity available in the data supplied by SHE Transmission on wind farm generation at low load, and it is very close to the forecast peak demand forecast (Central case) for Shetland over the life of the link.

SHEPD stands by the demand forecast used in the analysis as it was agreed by Ofgem for the NES process, and is the best available data. However, the relevance of the demand forecast is limited because it was undertaken for an island system with electricity provided by a power station, so demand is constrained by cost and technical limitations. The connection of Shetland to mainland GB would change that situation, making low cost electricity available to all customers on the islands, which is expected to boost demand and be a catalyst for economic development. Shetland Council, local political representatives, business and island groups recognise that removing the limitations on demand on the Island permits a wider range of economic development. Informal engagement with stakeholders leads SHEPD to believe that multi-MW increases in demand may arise in the oil and gas, and cruise ship sectors, and also through the electrification of heat and transport.

The demand forecast Central case is based on the average of the maximum demand over the years 2023 to 2030 which is a peak demand 47.4MW. Attempting to extrapolate the wind turbine production data between demand of 50MW and 47.4MW will not necessarily produce a more representative value. The use of the Central case demand from the demand forecast reduces the contribution by 1%.

The low demand case has been included for completeness but SHEPD notes a range of sources which consider demand reduction is not a credible future energy scenario, especially given the likely boost to demand once a link is established. Ofgem has most recently summarised this view within its RIIO-2 Sector Specific consultation:

*“In terms of electricity transmission and distribution networks, our current assessment is that we expect the advent of electrified transport and/or heat could create additional demand for network capacity. Low demand scenarios are not impossible, but would require large proportions of energy users to generate their own power or to purchase locally off-grid. We currently assess this as a low probability scenario.”*

Two High case demand scenarios have been modelled, including an estimate of the medium-term demand boost a connection to mainland GB would drive (based on informal discussion with demand customers on Shetland). SHEPD considers the establishment of a link to move the balance of probabilities to the higher end of the demand forecast values.<sup>2</sup>

## 2. Output of renewables

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<sup>2</sup> We would assume that new demand connections >2MVA which currently are liable to pay the full, unsubsidised cost of electricity generated on Shetland under BEIS’ “Shetland 2MVA Direction” would revert to paying the same costs as other demand connectees when Shetland has access to GB priced electricity supplied by the link, and a share of standby costs.



SHEPD tested scenarios to determine the probability that on island renewable generation would be insufficient to supply peak demand. The variables considered were:

- Installed capacity of renewables
- Different sources for estimates of the probability of low output from wind farms
- The addition of predictable tidal generation

SHEPD has used two sources of data for the production characteristics of large wind farms to identify the probability that they would not be able to generate enough output to meet Shetland peak demand, without support from the link. The Reference case is based on the data used for the link Needs Case submitted to Ofgem. The alternative data was supplied by the transmission-connecting developers of wind farms on Shetland. The values are similar, but those from the developers are slightly lower.

SHEPD also included an evaluation of the impact of exchanging intermittent wind generation capacity for increasing amounts of predictable tidal capacity. SHEPD does not believe that this is a credible scenario on which to base the capacity support mechanism, as wind capacity is expected to fully utilise the link before any significant tidal projects are developed.

### 3. Conclusions

SHEPD consider the Central case of the demand forecast to be an underestimate of the demand following the establishment of the link. Stakeholder views, as well as National Grid's Future Energy Scenarios, and Ofgem's RIIO-2 Sector Specific position on demand, support this position. The data from the Needs Case has limited granularity so using the demand forecast values requires the data to be extrapolated using curve fit methods. SHEPD does not believe that this value necessarily delivers a more representative value. In the absence of better data SHEPD is of the opinion that the approximation of 50MW is the most appropriate value to use as the Reference case and sees no obvious advantage in using the demand forecast Central value of 47.4MW or the High case of 51.5MW instead.

The data provided by wind farm developers may be more representative. However, SHEPD would note that one of the developers who provided data noted that even after a year of site monitoring differentiating between low load generation levels would be a highly uncertain number.

SHEPD believes that the Reference case of a peak demand of 50MW, a fully utilised link with 600MW of transmission connected wind capacity, and averaged forecast production data from the link Needs Case strikes the right balance of a reasonable assumption of peak demand on Shetland, a reasonable renewable energy assumption for Shetland and reliable wind turbine production data. SHEPD would note that the difference between the various sensitivity cases is small.

## h. Period considered by analysis

### *Section 5.3; Baringa report*

SHEPD's fair value assessment, and associated contribution, is calculated on the basis of the DSO acquiring 45 years of usage of the transmission asset, whereas the evaluation of the costs and benefits of the distribution link and the transmission link undertaken by Baringa used a 20 year horizon. The net result of Baringa's cost benefit analysis can be turned into a 20 year annuity. To calculate the contribution value based on 45 years of usage, a 45 year present value of this 20 year annuity was calculated. This approach and calculation has been sense-checked by Baringa.

## **i. Transmission link cost**

### *Section 6.5*

SHEPD's contribution value utilises the latest cost value provided by SHE Transmission in the public domain. We refer stakeholders to the most recent information published on the link cost within Ofgem's Consultation on Final Needs Case and Delivery Model for the Shetland transmission project.

## **j. Cost recovery**

### *Section 9*

We have been working under the assumption that the policy decision to move Shetland subsidy recovery from North of Scotland distribution consumers to GB-wide recovery using the existing HBRS mechanism remains.<sup>3</sup> As part of its three-yearly review of the Common Tariff Obligation and Hydro Benefit Replacement Scheme, we understand that a proposed approach for implementation may be consulted on in summer 2019. SHEPD has been assisting BEIS through the provision of information on costs of interim Shetland energy arrangements and existing cost recovery mechanisms.

## **k. CMP 303**

### *Section 7, particularly 7.5*

CMP303<sup>4</sup> is a proposed modification to the Connection and Use of System Code (CUSC), which was raised by EDF Energy, submitted to the CUSC Modifications Panel for its consideration on 27 July 2018. The proposal argues that the methodology in place to determine the costs of transmission links passed on to generators may unfairly charge generators costs for functionality they may not require. The modification proposes a number of ways to change the calculation methodology, including an option similar to the fair value contribution approach and mechanism set out in SHEPD's Recommendation - see WACM 4, and also hybrid proposals WACMs 5, 6 and 7, in the Final Modification Report.<sup>5</sup> The Final Modification Proposal is currently with Ofgem for consideration and a decision is expected soon.

SHEPD have responded to note that it could be beneficial to consider CMP 303 and the Shetland recommendation in the round, if Ofgem (and stakeholders) agree with SHEPD's whole system proposals, and consider that CMP 303 offers a route for its implementation. Considering both proposals holistically would, in our view, need to incorporate stakeholder feedback to Ofgem's consultation on SHEPD's contribution proposals.

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<sup>3</sup>[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/534154/Government\\_Response\\_Hydro\\_Benefit\\_4\\_July.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/534154/Government_Response_Hydro_Benefit_4_July.pdf)

<sup>4</sup><https://www.nationalgrideso.com/codes/connection-and-use-system-code-cusc/modifications/improving-local-circuit-charge-cost>

<sup>5</sup> <https://www.nationalgrideso.com/document/142286/download>

## I. Pan-island application

### *Section 6.4*

SHEPD is preparing to share further detailed analysis on proposed contributions for Western Isles and Orkney with Ofgem, and to publish and share a selection of this information with relevant island stakeholders over the coming weeks.