

To all interested stakeholders

Email: NTIMailbox@ofgem.gov.uk

Date: 29<sup>th</sup> May 2019

## **Consultation on Scottish Hydro Electric Power Distribution's proposals to contribute towards proposed electricity transmission links to Shetland, Western Isles and Orkney**

This letter sets out, for consultation, our views on proposals by Scottish Hydro Electric Power Distribution (SHEPD) to contribute financially towards proposed electricity transmission links to Shetland, Western Isles and Orkney.

In summary we:

- Agree the principle of a licensee contributing towards another licensee's project, where this is shown to benefit consumers.
- Consider that we may be able to approve SHEPD making a contribution towards the cost of a transmission link where this contribution justifiably reflects the value of the transmission link to demand consumers.
- Consider that for Shetland, the methodology proposed by SHEPD calculates a contribution value that may appropriately reflect the value of the transmission link to its distribution customers. SHEPD propose that the value of the contribution would be around £250m based on its current assumptions. We also support the principle of setting a 'cap' on the level of contribution to protect SHEPD's distribution customers.
- However, we do not have enough clarity or certainty on how the SHEPD proposal could most appropriately be implemented through industry codes and licences to be able to approve the SHEPD proposal at this stage.
- Consider that for Western Isles and Orkney, the methodology does not yet sufficiently justify why any contribution is appropriate, nor does it yet provide sufficient justification of the value of any contribution, should such a contribution be appropriate.

**We are inviting views from stakeholders by 10<sup>th</sup> July 2019.** We have provided specific questions throughout this letter for stakeholders to respond to, however stakeholders should not feel constrained by those questions in making their response.

### **Introduction**

We are currently consulting on submissions by Scottish Hydro Electric Transmission (SHET) for proposed new electricity transmission links to Shetland and the Western Isles. A similar consultation on a proposal from SHET for a new electricity transmission link to Orkney

closed in February. Our consultations on the “Needs Cases” for these projects are available on our website.<sup>1</sup>

Our common consultation position for these projects is that, for Ofgem to approve the Final Needs Case for the proposed transmission connection, SHET must demonstrate by a certain date that sufficient generation is likely to come forward to justify the need for and the size of link proposed. As outlined in our consultations, BEIS’s decision to allow generators on remote islands to bid in to Pot 2 of the Contract for Difference (CfD) allocation round was partially driven by the fact that those generators face significantly higher transmission costs than other onshore wind of connecting to, and using, the transmission system, due to their distance from the mainland.

SHEPD, the owner of the distribution system in the north of Scotland region, has submitted to Ofgem proposals for financial contributions (on behalf of its customers) to the proposed Shetland, Western Isles and Orkney transmission links. The nature of the proposals differ between Shetland and Western Isles/Orkney due to the differences in the current electricity networks on the islands and differences in SHEPD’s current Distribution Network Operator (DNO) licence obligations.

We have provided more detail on the background to the proposals in Annex 1, and a summary of SHEPD’s proposals in Annex 2. Further details on SHEPD’s proposals are available on our website.

### *Shetland*

For Shetland, a new solution to ensure security of supply must be in place by 2025, or significant additional investment will be needed. SHEPD has therefore proposed that its electricity distribution customers<sup>2</sup> make a contribution to the cost of the proposed Shetland transmission link, which it considers would reflect the fair value of the benefit to its customers from the link securing supply on Shetland. The proposals from SHEPD would represent a deviation from the prevailing arrangements. Under the prevailing arrangements SHEPD customers would not usually pay for any proportion of the transmission link. Instead, SHEPD customers would only pay for the assets that connect the distribution system to the transmission system.<sup>3</sup>

Notwithstanding the above, SHEPD considers contributing to the cost of the proposed Shetland transmission link would reduce the cost of meeting security of supply on Shetland compared to a scenario where a transmission link was not built and security of supply needs were met by other means.

In order to protect consumers SHEPD, has proposed a cap on the value of the contribution to ensure that its customers would be protected from paying more than they would otherwise pay. SHEPD has proposed a cap of £394m, which it considers reflects the cost of a distribution link to ensure security of supply on Shetland.

SHEPD proposes that the contribution would be paid to the relevant Transmission Owner (TO)<sup>4</sup> on completion of construction of the transmission assets (if Ofgem approves the project Needs Case and a transmission link were built). SHEPD proposes under its contribution methodology that SHEPD determines an estimated value before the 2019 CfD allocation round (we refer to this as the ‘provisional contribution value’), and that the final value is only determined following our assessment of the efficient costs of the transmission link<sup>5</sup> (we refer to this as the ‘final contribution value’). SHEPD considers that two of the three elements of the contribution methodology (described in detail in Annex 2) would not vary between the provisional and final contribution value stages.

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<sup>1</sup> <https://www.ofgem.gov.uk/electricity/transmission-networks/critical-investments/strategic-wider-works/scottish-island-links>

<sup>2</sup> All distribution customers in the SHEPD region (north of Scotland).

<sup>3</sup> As set out in Annex 2, SHEPD estimate this to be approximately £30m for Shetland.

<sup>4</sup> SHET in the context of Scottish island links

<sup>5</sup> Provisionally mid 2020 if Ofgem approves the project Needs Case.

SHEPD proposes that the contribution would have the effect of reducing the capital cost confirmed to National Grid Electricity System Operator (NGESO) for the purposes of calculating the local circuit element of the Transmission Network Use of System (TNUoS) charge for local generators. This in turn would allow those generators to reflect those lower charges in reductions in their CfD price bid in the 2019 CfD allocation round, raising the chances of that generation being successful, and of an associated transmission link being built and connecting to the Shetland distribution system. As such, SHEPD requested that Ofgem confirms support for the SHEPD proposal in advance of the 2019 CfD allocation round, in order to provide local generators with a view on their potential TNUoS charges before the CfD round.

### *Western Isles and Orkney*

SHEPD has also submitted to Ofgem information regarding the application of its contribution proposal to the proposed Western Isles and Orkney transmission projects.

SHEPD's proposals for Western Isles and Orkney are the same as the SHEPD proposals for Shetland in certain areas:

- there would be a contribution by SHEPD to the TO, paid following completion of construction of the transmission assets (if they were needed);
- the contribution would have the effect of reducing the capital cost confirmed to NGESO for the purposes of calculating the local circuit element of the TNUoS charge for local generators; and
- SHEPD similarly asks that Ofgem confirms support for the SHEPD proposal in advance of the 2019 CfD allocation round, in order to provide local generators with a view on their potential TNUoS charges before the CfD round.

SHEPD's proposed contribution methodology for Western Isles and Orkney is different in some key aspects to its proposed methodology for the contribution to the proposed Shetland project. These differences reflect the specific and differing circumstances of security of supply on those islands. Specifically, SHEPD states that there is currently "*no near-term, material or critical distribution need for the Western Isles or Orkney which a transmission link would meet, as both island groups have existing links to mainland Scotland with associated embedded generation to maintain security of supply*".<sup>6</sup> It indicates that it could seek to value the benefits of a transmission link to those islands by estimating the reduced cost of operating the on-island backup generation. The impact of this difference is that both the justification for the contribution, and SHEPD's estimates of the provisional contribution value (Western Isles - £20 to 26m; Orkney - £15m), differ significantly. SHEPD do not propose that this figure varies over time, i.e. it would be set once.

### *Links to CMP303*

There is an ongoing modification proposal to address an alleged defect, identified by Connection and Use of System Code (CUSC) Modification Proposal (CMP) 303 – 'Improving local circuit charge cost-reflectivity'.<sup>7</sup> We are aware that an alternative approach to this modification proposal has been put forward, and that there are some interactions between this and the funding proposals in this letter. We will assess the CMP303 proposal in line with our role in the industry's open governance procedures.

## **Our views on SHEPD's proposals in general**

Our review of SHEPD's proposals has considered:

- the principle of a contribution from a DNO to a transmission project;

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<sup>6</sup> Information from the SHEPD submission.

<sup>7</sup> <https://www.nationalgrideso.com/codes/connection-and-use-system-code-cusc/modifications/improving-local-circuit-charge-cost>

- the robustness of the methodology to determine the need for and value of the contribution, ie whether a contribution is needed and how the value of any contribution would be determined;
- how the methodology could be most appropriately implemented, ie what licence and industry code arrangements would most robustly support implementation;
- when the value of the contribution should be determined; and
- any wider implications that should be considered, eg potential to set precedent for other projects and charging arrangements.

### **Principle of a SHEPD contribution to a transmission project**

We welcome that SHEPD has put forward these proposals to seek to reduce overall consumer costs by coordinating activity across distribution and transmission networks. We encourage other licensees to proactively identify potential opportunities to secure benefits for consumers.

It is likely that there will be circumstances where parties will be able to deliver a more beneficial solution, with greater benefits for consumers, by contributing efficient costs to reflect the benefits they receive. Therefore, we agree the principle of DNO contributions towards a transmission link and consider that there may be circumstances in which we would approve SHEPD making a contribution towards the cost of a transmission link, where this was shown to benefit consumers.

### **The robustness of the methodology to determine the need for and value of the contribution**

As SHEPD has proposed different methodologies to determine the need for and value of the contribution for Shetland and Western Isles/Orkney, we consider these methodologies separately later in this letter. Our overall views are that:

- For Shetland, the methodology calculates a contribution value that may appropriately reflect the value of the transmission link to demand consumers.
- We support the principle of setting a 'cap' on the level of contribution to protect SHEPD's distribution customers. We have not reached a view on the appropriate level of that cap.
- However, we note in the next section why we do not consider it appropriate to approve the SHEPD proposal at this stage. We also note that there are several reasons why we do not consider that local generators or other stakeholders should place reliance on a provisional contribution value for Shetland.
- For Western Isles and Orkney, the methodology does not yet not sufficiently justify why any contribution is appropriate, nor does it yet provide sufficient justification of the value of any contribution, should such a contribution be appropriate.

### **How the methodology could be most appropriately implemented**

At this stage, we do not have enough clarity on how the SHEPD proposals could most appropriately be implemented through industry codes and licences to be able to approve the proposals. We need to ensure that the proposed methods for implementing the SHEPD proposals are robust and transparent. This ensures that both we and stakeholders are fully aware of the direct and wider implications and risks of the proposals, and can be certain of how and when the proposals would be implemented. We set out below the areas where we require further information or clarity.

#### *Changes to industry codes*

There is a lack of clarity and certainty on relevant changes to industry arrangements to implement the SHEPD proposals. SHEPD's view is that no changes would be required to the CUSC to facilitate its proposals. Instead, it considers, for reason of simplicity and speed in the tight timescales, that a change of interpretation of the CUSC methodology for calculating local circuit charges would be sufficient, with a transfer of funds between SHEPD

and SHET. However, it is not clear to us from SHEPD's engagement with the NGESO that this approach is viable without changes to the CUSC.

If it is determined that changes to industry codes are required, these would likely be considered through standard industry code governance arrangements in order to most efficiently manage any interactions with other areas of work.

#### *Changes to Licences*

SHEPD would like changes made to its licence to enable the transfer of the proposed contribution to SHET. However, we have not received sufficient detail about the scope of those proposed licence changes to be able to assess the impact and interactions with the contribution methodology, SHEPD's existing licence conditions, and wider regulatory considerations such as financeability.

Furthermore, there are some areas that have not yet been considered by SHEPD. For example, we set out in our needs case consultations that we propose to fund delivery of the Shetland, Western Isles and Orkney transmission projects under the Competition Proxy Model (CPM), in the event that we approve the Final Needs Case for the project. The interaction of the SHEPD proposals with CPM would need to be considered carefully. Our analysis for CPM has shown that different financial parameters are more appropriate for funding the delivery of new, separable, and high value transmission projects than those of the prevailing RIIO price controls. We would need to consider whether consumers would be missing out on benefits of the CPM in the delivery of the same piece of transmission infrastructure, if it was part-funded by another licensee at a different rate of return. To ensure consumers are not worse off, we would need to consider whether different financial arrangements should be put in place for SHEPD's contribution. This would need to be considered as part of licence changes identified by SHEPD in any future submission.

#### *Considerations of regulatory and legal requirements*

We also do not have enough information to be fully satisfied that the proposals can be implemented in accordance with all relevant legislative and regulatory requirements. Notwithstanding this, at this stage we do not consider that the proposals unlawfully distort competition, despite the involvement of the SSE Group across the distribution, transmission, and (in Shetland) generation activities.

We will engage further with SHEPD on other relevant regulatory and legal areas ahead of any future decision on the SHEPD proposal.

#### **Our views on timing for confirming the contribution**

We understand SHEPD's reasoning for why it considers it important that there is a determination of a provisional contribution value before the 2019 CfD allocation round, so that local generators can use this to inform their TNUoS charges assumptions and CfD bids. However, there are several reasons why we consider it may not be appropriate, or even necessary, to place any reliance on a provisional contribution value at this stage.

#### *Whether it is necessary to place reliance on a provisional contribution value*

Analysis by SHEPD of the competitive position of local generators on Shetland shows that it's not clear whether those generators would in all cases require a contribution in order to be successful in the CfD allocation round. This is because there are lots of variables and unknown factors that will determine which generators would eventually be most competitive in the CfD allocation round. We consider that this is also likely to be the case on Western Isles and Orkney.

In addition, our needs case consultation on the proposed transmission links to Shetland and Western Isles highlighted material differences between the current indicative capital costs

for the links<sup>8</sup> (as estimated by SHE-T) and our cost benchmarks derived from comparable projects.<sup>9</sup> For Orkney we did not flag material concerns with the proposed capital costs for the link; however, we noted that we would consider the capital costs more closely at the Project Assessment stage (should we approve the need for the link). Any reductions we make to the capital cost allowances for the Shetland, Western Isles or Orkney transmission links would likely reduce TNUoS for local generators. Generators may therefore choose to reflect these reductions in their CfD bids, although we noted that we are unlikely to determine the final capital cost allowances for the Shetland, Western Isles and Orkney projects until at least mid-2020, following Project Assessment (if we approve the needs cases for these projects).

It is therefore possible that generation on Shetland, Western Isles or Orkney may be successful in the next CfD allocation round without any contribution by SHEPD to the cost of the transmission link. On Orkney, various stakeholders responding to our consultation indicated that generation could proceed on the island without the need for a CfD.

#### *Whether it is appropriate to place reliance on a provisional contribution value*

Notwithstanding the above, it is possible that local generators may wish to use a provisional contribution value to inform their TNUoS charges assumptions and CfD bids before the 2019 CfD allocation round.

For **Shetland** we set out earlier that we consider that SHEPD's proposed methodology calculates a contribution value that may appropriately reflect the value of the transmission link to demand consumers. However, there are two reasons why we do not consider that local generators or other stakeholders should place reliance on the provisional contribution value proposed for Shetland at this stage.

Firstly, and most importantly, as set out earlier, we do not have enough clarity or certainty on how the SHEPD proposals could most appropriately be implemented through industry codes and licences to be able to approve the proposals at this stage. This means that we may either not ultimately approve the proposals, or that the processes for approval of code changes (if these are required) and/or licence changes may lead to adjustments to the methodology for calculating the contribution value.

Secondly, as noted earlier and set out in further detail later, the contribution methodology for Shetland already includes a parameter that varies the final contribution value in line with Ofgem's final determination of the capital cost allowance for the transmission link (not expected until at least early/mid-2020).

For **Western Isles** and **Orkney**, we set out earlier that the methodology does not yet sufficiently justify why any contribution is appropriate, nor does it yet provide sufficient justification of the value of any contribution, should such a contribution be appropriate. We would therefore require further justification on these matters from SHEPD before considering whether any provisional contribution value is necessary or appears appropriate. For the avoidance of doubt, we consider that local generators and stakeholders should therefore not place any reliance at this stage on the provisional contribution values proposed by SHEPD.

#### **Any wider implications that should be considered**

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<sup>8</sup> Further information on our views on the costs of the Shetland and Western Isles projects are available in the relevant needs case consultations: <https://www.ofgem.gov.uk/electricity/transmission-networks/critical-investments/strategic-wider-works/scottish-island-links>  
<https://www.ofgem.gov.uk/publications-and-updates/western-isles-transmission-project-consultation-final-needs-case-and-delivery-model>

<sup>9</sup> For Shetland: SHE-T's estimate is £709m. Applying our benchmarking analysis for offshore transmission and interconnector assets, our initial benchmarking exercise indicates that the capital costs for the Shetland project could be significantly lower – in the range of £368m to £395m.  
For Western Isles: SHE-T's estimate for a 600MW link is £623.8m. Applying our benchmarking analysis for offshore transmission and interconnector assets, our initial benchmarking exercise indicates that the capital costs for the 600MW link could be significantly lower – in the range of £360m to £409m.

It is possible that the SHEPD proposals, if approved, could inform future network charging arrangements beyond the Shetland, Western Isles and Orkney projects considered by SHEPD. We note that SHEPD has also suggested the principle of its contribution proposal being applied in other contexts in future. We consider this could include links to an ongoing code modification proposal (CMP303 – referred to earlier in this letter) or beyond this in other future code modification proposals.

If applied more broadly to other projects, we would want to consider the risks and effects on a case-by-case basis, and ensure that any proposal would not inefficiently shift costs from local generators to wider GB consumers or set other detrimental precedents.

### **Questions**

**Question 1:** What are your views on the principle of DNO contributions to transmission projects generally, and contributions by SHEPD to the Shetland, Orkney and Western Isles transmission projects specifically?

**Question 2:** What are your views on the robustness of the methodology to determine the need for and value of the contribution?

- Do you agree with our views on the methodology proposed for Shetland and Western Isles/Orkney, as set out in Annex 2?

**Question 3:** What are your views on how the methodology could be most appropriately implemented?

- Do you agree that more detail is required on the proposed implementation of the contribution in SHEPD's licence and industry codes before we can approve any proposal?
- Would it be more appropriate for the SHEPD proposals to be formally considered through standard industry code governance arrangements?

**Question 4:** What are your views on timing for confirming the contribution?

- Are there other areas of uncertainty within the proposals or wider frameworks that we have not considered and which would impact the effectiveness of the SHEPD proposals?

**Question 5:** What are your views on any wider implications that should be considered?

- How can any wider implications best be managed?

### **Next steps**

We intend to update stakeholders on our views on the SHEPD proposals following our consideration of stakeholder responses to this letter.

Subject to any changes to our views following consideration of stakeholder responses, we currently consider that we will require further information on how the SHEPD proposals could most appropriately be implemented through industry codes and licences. If changes were required to industry codes, we would expect these to be considered formally through appropriate change arrangements and governance. The timing for any such arrangements would need to be determined by the relevant code administrators.

We would also expect to receive details from SHEPD of proposed licence changes that address the issues raised in this letter and that align with any revisions to the contribution

methodology through the industry code change processes. If we agreed with these proposed licence changes, we would need to consult on those changes in due course.

Finally, with regards to the proposals for Western Isles and Orkney, in addition to the above we would also expect to receive further justification on why any contribution is appropriate, and if so, the appropriate value of any contribution.

Yours sincerely,

**Cathryn Scott**  
**Director, Wholesale Markets and Commercial**



## **Annex 1 – Background to the SHEPD proposals**

### **Shetland energy security**

Shetland's electricity supply is largely generated from Lerwick Power Station (LPS), which is approaching the end of its operational life and was set to breach emissions targets set by the EU Industrial Emissions Directive (IED) from 2020. Smaller amounts of generation are provided by the Sullom Voe Terminal gas plant, and an Active Network Management (ANM) scheme facilitating 12.4MW of renewable generation.<sup>10</sup>

In its capacity as the system operator on Shetland, SHEPD submitted an integrated plan to us in July 2013 for a new full-duty dual-fuel 90MW power station to be owned by SSE Generation Ltd and delivered on Shetland in 2017. We rejected this proposal as we considered that SHEPD had not sufficiently tested the market for an efficient and economical solution. Specifically, we were not persuaded that the costs put forward were the most efficient and competitive, as SHEPD had not provided enough evidence to demonstrate this.

In April 2014, we directed SHEPD to run a competitive process to identify the most efficient solution for Shetland's energy future (the '*Shetland New Energy Solution*' – SNES). In May 2017 a joint bid by NGSLL<sup>11</sup>-Aggreko won the competitive process with a mixed distribution link and on-island backup generation solution.

In November 2017 we decided to reject the costs and outcome of the competition. Shortly after the conclusion of the competition, there were two important developments which affected the assessment of the best energy solution for Shetland. Firstly, changes to the IED that would allow the new and existing engines at LPS to continue until 2025 and 2030 respectively (as opposed to 2020), were confirmed by the Scottish Environment Protection Agency (SEPA). Secondly, in October 2017, the Government announced that, subject to receiving State Aid approval, wind farms on remote islands such as Shetland would be eligible to compete for CfD in the next allocation round for less established technologies, planned for 2019.

In light of the published changes under the IED, we sought assurance from SHEPD that security of supply on Shetland could be maintained until at least 2025. SHEPD confirmed that with targeted investment, security of supply can be provided until 2025 through a combination of LPS and additional supporting measures.

2025 is therefore the current date by which a new solution must be in place to ensure security of supply on Shetland, or the time by which additional investment may be needed to extend the life of LPS.

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<sup>10</sup> A mix of small scale wind and tidal.

<sup>11</sup> National Grid Shetland Link Ltd

## **Annex 2 – Summary of SHEPD’s proposals**

### **Proposed approach for Shetland**

#### **Outline of approach**

SHEPD’s submission has stated that, under a Whole System context, *“The purpose of the contribution methodology is to provide a set of commercial and regulatory arrangements to govern cases where a DSO makes a financial contribution towards a new transmission link to an outlying distribution system (e.g. a Scottish island) in a situation where the needs case for the construction of the transmission link depends on it being used both for generation and demand: at times where there is a large amount of power generation on or near the island, the transmission link transports power to the main part of the transmission system; at times where there is a positive net demand on the outlying distribution system and no other local generation, the link meets that demand by transporting power to the island. The transmission link also provides frequency control for the island system.”*

SHEPD has undertaken an assessment to identify the value of services that its customers would receive from a transmission link connected to Shetland. We have set out in the next section an overview of its methodology for assessing this value.

SHEPD proposes to pay the amount determined via the contribution methodology (as a one-off payment) to the Transmission Owner (TO) developing the transmission link to the island. In the cases of the remote islands, this would be to SHET. The contribution would be made on completion of construction of the transmission assets by the TO. SHEPD proposes under its contribution methodology that the contribution amount would be provisionally determined before the 2019 CfD allocation round and then finalised following our assessment of the efficient costs of the transmission link (provisionally early/mid 2020), if the Needs Case for a transmission link was ultimately approved.

The value of the payment would be added to SHEPD’s regulatory asset base and would be recovered from consumers over 45 years.

The effect of the payment would be to reduce the TO’s overall revenue allowances and the notional capital costs allocated to the transmission link, which in turn would reduce the effective transmission charges (TNUoS) for generators on the remote island.

Under usual arrangements, SHEPD considers it would pay circa. £30m in order to connect the demand system to the transmission system via a new Grid Supply Point. This amount will need to be paid regardless of any contribution.

#### *Hydro benefit replacement scheme*

SHEPD proposes that the costs of any solution for demand security on Shetland, including this proposed contribution, would ultimately be recovered through the Hydro Benefit Replacement Scheme (HBRS). The HBRS is an existing statutory scheme that provides a cross-subsidy to consumers in the North of Scotland from all GB consumers to account for the high cost of distribution. It sits outside the main contractual framework governing connection and use of the system, with licenced suppliers across GB obliged under the terms of their licence to pay a tariff to cover the costs of the cross-subsidy. In effect, all GB consumers would be paying for the costs of the SHEPD contribution, rather than SHEPD or Shetland consumers exclusively.

There is a statutory requirement to review the HBRS every three years, and it would be for the Department for Business, Energy, and Industrial Strategy (BEIS) to decide as part of a future review whether to seek to amend the relevant statutory instrument that governs the HBRS. Ofgem does not have a formal role in any change to the statutory instrument, and we do not believe it is directly relevant to our current consideration.

## Contribution methodology

SHEPD has proposed a methodology to calculate the value of a transmission link to Shetland demand customers. We have set out in Table A2.1 a summary of the three components of the contribution SHEPD proposes to make.

We have also provided SHEPD's central view of the estimated value of the contribution (as determined by the methodology based on assumptions from 2018) in relation to Shetland.

**Table A2.1 – Summary of components of the contribution**

<b>Component of contribution</b>	<b>SHEPD Description</b>	<b>Rationale</b>	<b>Estimated value for Shetland</b>
Control support	"offered via the highly effective control of the distribution system provided by an HVDC link converter station."	<p>An HVDC link can provide the voltage and frequency regulation required to maintain system stability on an island. If an HVDC link wasn't in place, this would need to be achieved by other means. SHEPD has assumed this would be via a new conventional thermal generator.</p> <p>The benefit has been valued by assuming the HVDC link would bring the island into line with mainland GB on carbon intensity. Difference in carbon intensity monetised using BEIS carbon price forecasts.</p>	£116m
Capacity support	"as the link provides the instantaneous ability to satisfy any practical future Shetland demand at all times and at no notice."	<p>An HVDC link can both export wind energy to GB and import power to an island when wind is low. Therefore, there may be times of the year when the island is dependent on the link for meeting its full demand requirements.</p> <p>In the context of Shetland, SHEPD assert that around 17.4% of the time, future Shetland wind generation will be less than 50MW (around Shetland peak demand). Therefore, Shetland would be dependent on a link to import power for 17.4% of the time, and should pay for 17.4% of the costs of the transmission link.</p>	£123m
Losses reduction	"the reduction in losses achieved because the proposed link operates at a higher voltage than the link proposed in the 2017 NES process."	A transmission link operates at a higher voltage. There are therefore lower technical losses from importing the same amount of energy to an island compared to a distribution voltage level alternative. Those losses are valued at forecast wholesale power prices.	£10m

We set out below our views on each of the above elements.

### *Control support*

As described in Table A2.1, the 'control support' element of SHEPD's proposal is based on monetising the difference in carbon intensity between Shetland powered by on-island gas oil generation and mainland GB, using forecasts of the carbon price.

We challenged SHEPD whether this was an appropriate way to value the benefits to distribution customers of a transmission link, given that the successful bidder in the 2016 SNES competition was a distribution link and not SSE generation's proposed on-island gas oil power station.

SHEPD made the case that the contribution element seeks to determine a fair value for the particular service provided by a transmission link. It contends that if we were to assume that, in future, a distribution link was in place that would equalise carbon intensity between Shetland and mainland GB, then the full cost of that distribution link should be the value of the contribution.

We also considered whether using BEIS forecasts of carbon price and carbon intensity was appropriate. We are comfortable with this as an approach, given it uses publicly available information and would be consistent with other uses of carbon prices.

### *Capacity support*

SHEPD's current estimate of the 'capacity support' element is £123m, which is derived from the multiplication of two components:

1. The amount of time that the island would be dependent on the link for security of supply (17.4%), based on:
  - the modelled export of wind generation on the island; and
  - the peak demand on the island.
2. The most recent SHET estimate of the cost of the proposed 600MW Shetland transmission link (£709m).

We challenged SHEPD on whether using peak demand as the threshold all year may substantially overstate the amount of time demand is actually greater than wind generation on the island. We also questioned whether the proposed figure appropriately takes into account future diversification of generation sources or solutions for intermittency following the construction of the link.

We asked SHEPD to provide us with sensitivities in relation to how those two elements could change, to understand the quantum of risk consumers would be taking on under SHEPD's preferred figure of 17.4%.

In summary, the sensitivities show that SHEPD consumers are most at risk of making an over-contribution in situations where:

- **The electricity demand on the island reduces** – SHEPD consider this scenario to be of low probability as they consider a transmission link would likely lead to a growth of demand from economic activity, and also point to National Grid's Future Energy Scenarios<sup>12</sup> which point towards future demand growth.
- **The generation on Shetland exceeds SHEPD's assumed production curves and capacity factors<sup>13</sup> (i.e. the island has higher levels of energy export than modelled)** – SHEPD indicate that this is a possible outcome, however the impact would be small (1-2%).

Conversely, SHEPD consumers would have 'under-contributed' to the link where demand materially increases, generation does not meet the expected production levels, or the transmission link is underutilised (e.g. if substantially less than 600MW of generation comes forward).

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<sup>12</sup> <http://fes.nationalgrid.com>

<sup>13</sup> The SHEPD proposal uses the same production curves and capacity factors as in the SHE-T transmission needs case.

SHEPD's proposal mitigates the risk for its customers of this approach by only setting the 'capacity support' element's figure following our Project Assessment (provisionally mid 2020), where we would set the cost allowance for the project. Stakeholders should therefore be aware that the outturn quantum of this element would be uncertain prior to completion of Project Assessment.

#### *Losses reduction*

We are comfortable with the approach set out by SHEPD for calculating the electricity losses reduction from using a transmission level link over a distribution level link.

#### *Cap on contribution*

SHEPD consider that there should be a cap on its total possible contribution, ie a limit to how much it contributes, even if the assumptions and inputs into the methodology change to an extent that suggests a contribution value higher than the cap. This cap would be set at the total cost of the "best" alternative to a transmission link that secures supply to the island.

For Shetland, SHEPD consider that the "best" alternative security of supply approach would be the distribution link solution from the 2015 SNES competition. SHEPD estimate that the contribution to a transmission solution would not exceed £394m; this represents the point at which a distribution solution would represent better value to SHEPD's consumers. SHEPD contracted with Mott MacDonald to assess whether the cost of an equivalent distribution link had substantially changed since the SNES competition. It considered whether capital costs for HVDC links and standby generation equipment in currencies of the main suppliers (US\$, Yuan and Euro) had materially changed. Both Mott MacDonald and SHEPD (using internal benchmarks) concluded that expected costs had not materially changed.

We asked SHEPD to consider whether options other than the two put forward in the SNES competition (on-island full-duty dual-fuel generation, or a distribution link) could be viable in future. SHEPD considered alternative technology options including:

- Liquefied Natural Gas (LNG);
- Marine energy;
- Hydrogen; and
- Energy storage.

SHEPD considers that none of the alternative options it looked at would be more cost effective than either a distribution link, or a contribution to the cost of a transmission link.

#### **Implementation**

SHEPD has considered how any contribution would be implemented. SHEPD engaged a consultant to review the range of potential contribution methodologies and assess the benefits and risks of the preferred shortlist of options.

An initial 19 options were reduced to four to explore further. The four considered were:

1. SHEPD payment under contract with generators;
2. SHEPD payment under contract with the Electricity System Operator (ESO);
3. SHEPD payment under contract with relevant TO; and
4. New special transmission charge levied by the ESO on the Shetland DSO.

SHEPD's consultants preferred options 1 and 2. SHEPD considered that option 3 was preferable, primarily for reasons of simplicity and for the relatively fewer changes required to licences and codes. It considered that option 1 could have regulatory and legal

complications, and would need to potentially accommodate future generation connections. Its consultants do not recommend paying any contribution as an upfront capital sum, based on the risk of the receiving party exiting the Shetland market. However, SHEPD does not consider that material risks arise from upfront payment of a capital sum to another electricity licensee.

Taking these considerations into account, SHEPD developed an alternative approach summarised below.

- SHEPD would make a single payment to the relevant TO at the completion of construction of the transmission link.
- The TO reduces the "Base Circuit Capital Cost" which it notifies to the ESO as the base cost for the calculation of the TNUoS charges for the HVDC link. In effect, this would reduce the enduring local TNUoS tariffs for eligible generators on the remote island.
- SHEPD would recover the payment by increasing its Regulated Asset Value (RAV). The contribution received by the TO reduces the TO's RAV equivalently.

SHEPD also considers that some clarifications may be required to the Connection and Use of System Code (CUSC) to make clear how "Base Circuit Capital Cost" capital contributions should be considered when setting tariffs.

We have set out our views on this approach within the main body of the letter from page 4.

#### *Interactions with existing licence conditions*

SHEPD considers that some changes would be required to the SHEPD and SHET licences to facilitate the transfer of funding.

No further detail has been provided by SHEPD to-date. We have set out our views on this approach within the main body of the letter.

## **Proposed approach for Western Isles and Orkney**

The evidence provided by SHEPD indicates that there is currently "*no near-term, material or critical distribution need for the Western Isles or Orkney which a transmission link would meet, as both island groups have existing links to mainland Scotland with associated embedded generation to maintain security of supply*".<sup>14</sup>

SHEPD proposes that it could seek to value the benefits of a transmission link to those islands by estimating the reduced cost of operating the on-island backup generation.

On **Orkney**, if a transmission link was in place with the two existing distribution links, SHEPD proposes that it could avoid costs by reducing the running of Kirkwall power station, with the possibility of closing it at the end of its life. Indicatively, according to SHEPD, this could be around £15m on a present value basis.

On **Western Isles**, if a transmission link was in place supported by the one existing distribution link, SHEPD considers that two existing backup power stations could be placed on cold standby. Indicatively, according to SHEPD, this could avoid costs of around £20-26m on a present value basis.

SHEPD is currently undertaking further work to assess the network reliability and security of supply aspects of the above, and to confirm the avoided costs.

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<sup>14</sup> Information from the SHEPD submission.

## ***Our views***

We consider that SHEPD has not yet clearly justified whether any further investment is required in the near future to secure demand on Western Isles or Orkney, or whether the values proposed by SHEPD (Western Isles - £20 to 26m; Orkney - £15m) represent an appropriate level of contribution from SHEPD consumers.

We would need to see substantially more evidence of the validity of the avoided costs, and understand more accurately the timetable for, and likelihood of any replacement of existing assets, before being able to confirm whether the provisional contribution value proposed by SHEPD represents value for money for consumers.

As SHEPD intend for the methodology to be implemented in a similar manner to the Shetland contribution, our concerns on implementation described in the relevant earlier sections of this letter also apply.