

## **Western Isles Transmission Project; Consultation on Final Needs Case and Delivery Model.**

### **Schedule 1: SHE-Transmission's response to Final Needs Case Assessment.**

#### **Executive Summary**

Scottish Hydro Electric Transmission (SHE-Transmission) welcomes the opportunity to respond to Ofgem's consultation on the Western Isles Transmission Project: Consultation on Final Needs Case and Delivery Model.

Ofgem has correctly recognised the need for reinforcement of the current network on the Western Isles. Evidence of the renewable generation potential on the Western Isles clearly shows why there is confidence that any investment in new network infrastructure will be utilised and highlights the benefits that this can bring to the local economy and GB consumers.

- **SHE-Transmission welcomes Ofgem's recognition of the need for network reinforcement on the Western Isles.**

However, we maintain that a 600MW link is the optimal, most efficient solution to unlock the Western Isles renewable potential and **fundamentally disagrees with the conclusion** of the authority that the needs of customers could be sufficiently met by the creation of a 450MW link.

- **Ofgem's rationale for rejecting the 600MW link does not reflect a realistic set of outcomes and fails to account for the conditionality proposed.**

Ofgem's conclusion that the Cost Benefit Analysis (CBA) points to a 450MW link is driven by the inclusion of a scenario (Steady State) which assumes generation lower than SHE-Transmission's proposed conditionality. SHE-Transmission, **supported by the Electricity System Operator (ESO)**, strongly maintain that the results of the CBA, taking into consideration only those scenarios that have any likelihood of materialising, points to the 600MW solution being the correct technical solution to meet the identified need on the Western Isles.

Ofgem has suggested that there remains a risk of projects falling away after the CfD award and therefore exposing the consumer to stranded asset costs. In reality if a project drops off, it faces significant securities, such that they protect the GB consumer.

- **Rejecting the 600MW link and instead proposing a 450MW link would cost GB consumers significantly more in the long run.**

A 450MW link caps the connection of future low carbon generation growth. Only a further 81MW of generation above the anchor projects would be able to connect without the possibility of constrained access over the 45-year life of the asset. Furthermore, the cost differential between a 450MW and 600MW link is less than £30m. This equates to just 5% of the total investment, yet it unlocks 231MW of additional capacity for new low carbon generation.

We have demonstrated that in addition to the two anchor projects, there is currently more than **180MW of generation already interested in connecting to the link**. Based on our experience from building other large transmission links, we know that once the market has confidence that a link will be built, many more developers will look to connect.

A 600MW link has widespread political and local support. To limit the industry's ability to exploit the vast natural resources on the island for the sake a short term saving in capex is nonsensical, particularly considering the analysis provided by SHE-Transmission, which shows **the cost of a secondary cable being in excess of £270m** in Present Value Terms. The additional capex required to fund a 600MW over a 450MW would be around a tenth of this.

- **To reject the 600MW proposal risks jeopardising the entire project and blocking the Western Isles renewable potential.**

Moving to a 450MW link would present significant supply chain challenges due to the need to re-tender for major delivery contracts. It is unlikely that the re-tendering exercise would result in static prices, hence there remains a clear risk that **any predicted cost savings could quickly be eroded**.

Indeed, the need to re-tender would result in a significant delay to project energisation to the extent that it is unlikely that energisation could be achieved within the delivery years of the auction (2023/24 & 2024/25). Furthermore, re-tendering exercise would require at least 15 months to undertake, meaning developers would have no clarity on their grid costs in advance of the 2019 CfD auction, severely impacting their ability to compete in the auction.

- **The outcome of Ofgem's needs case review reflects a disconnect between UK energy and business policy and regulation.**

Ofgem has failed to acknowledge any carbon saving or progress toward UK targets within its decision and ultimately risks denying consumers access to much needed low carbon electricity resources. Ofgem should also consider the impact on fuel poverty on the Western Isles and how renewable investment can help meet the policy aspirations of the Scottish Government and the UK's legally binding emission reduction goals. These targets do not exist in a vacuum, instead can only be met by being forward looking, and accepting the wider benefits the transmission will bring locally and how it compliments UK Government Carbon objectives.

- **Ofgem should approve a 600MW link, predicated on developer success in the CfD, which the CBA analysis robustly supports.**

Failing to do so will ultimately harm GB consumers by not unlocking the consumer benefits that the link will provide, as well as the important wider benefits that the projects will bring both locally and nationally.

## **Conclusion**

SHE-Transmission is firmly of the view that Ofgem must reconsider its position as outlined in its minded-to consultation on the Western Isles' Needs Case and proposed Delivery Model. The evidence presented in the Needs Case clearly demonstrates that a 600MW link remains the **most cost-effective long-term** solution to the challenge of developing the vast natural resources on the Western Isles. SHE-Transmission has not only demonstrated wider benefits to the GB consumer, but far reaching socio-economic benefits of the link. Conversely, Ofgem has been selective in the use of this evidence and ignored the recommendations of the ESO's independent report.

Ofgem's conclusion that a 450MW solution provides better value for the GB consumer is unjustified and contradictory to its stated aims, namely ensuring the provision of a fairer and cleaner energy system which is **fit for the future and saves consumers money**<sup>1</sup>.

Ofgem has also not considered key information regarding the cost differential of both links, i.e. circa £30m, and how the benefits of the 600MW solution greatly outstrips this over its 45-year life. SHE-Transmission has demonstrated that switching to a smaller link would require re-tendering and this adds even further costs, again reducing the cost differential between the 450MW and 600MW links. Not to mention that a 450MW link provides very little future capacity for the number of projects looking to connect.

Ofgem's conclusion is predicated on an extremely narrow subset of the information submitted by SHE-Transmission. We have provided additional analysis and tools, showing actual generation that is in progress, the number of potential projects and the benefits the 600MW link can provide past its breakeven point, which our conditionality already exceeds. None of this potential generation will have a chance and as such be constrained, or a second future link costing in the region of £270 million would be needed. This does not benefit the GB consumer. In fact, it could prove detrimental and goes against Ofgem's own stated objectives. It is imperative that Ofgem reconsiders its position.

Our response to the consultation questions provides further detail of our position. These are outlined below. We look forward to the opportunity to discuss our concerns with Ofgem in due course.

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<sup>1</sup> <https://www.ofgem.gov.uk/publications-and-updates/ofgem-cuts-costs-smarter-fairer-and-cleaner-energy-system>

## **APPENDIX - Consultation Questions 1-6**

### **1. Do you agree that the current network on the Western Isles needs reinforcing in order to connect additional generation?**

Yes, the Needs Case and subsequent analysis undertaken by SHE-Transmission demonstrates that the network on Western Isles needs reinforcing to enable the connection of additional generation. The existing low capacity link to the Western Isles is full and additional capacity is required to allow more generation to connect and export to the mainland.

However, we fundamentally disagree with Ofgem's decision to reject the Needs Case for a 600MW link.

### **2. What are your views on the generation scenarios developed by SHE-T? We are particularly interested in views on the likelihood of wind generation on the Western Isles developing to the levels predicted by SHE-T's scenarios.**

#### **Generation Scenarios**

SHE-Transmission developed four generation scenarios using an evidence-based approach developed by GHD and agreed with the ESO. These were designed to give a more accurate picture of the local generation on the Western Isles. In addition, four scenarios were taken from National Grids Future Energy Scenarios publication.

These 8 generation scenarios were used as part of our Cost Benefit Analysis (CBA), which aims to select the best investment option to support the transfer of power in an area of the network.

SHE-Transmission firmly believes that these provided a comprehensive range of potential generation outcomes on the Western Isles and demonstrated a strong likelihood of wind generation developing to the levels predicted.

#### **Wind Generation Development**

GHD has identified 180MW of specific potential generation projects (over and above the two 369 MW Lewis Wind Power projects) that are at various stages of development, ranging from fully consented to pre-screening. These include community projects, projects involving Council ownership and projects belonging to private developers or major utilities. None of these additional projects are considered in the FES. As a result, the **scenarios put forward by the ESO are not sufficiently diverse** on the Western Isles to fully capture a 'high' and 'low' scenario outcome.

A 450 MW link puts these other projects at risk, as it only allows 81 MW of generation to come forward in the 45-year life of the asset. This is unrealistic, with a potential need for a second more costly link in the future when compared to the costs of SHE-Transmission's proposal.

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SHE-Transmission firmly believes that our scenarios show a wider range of potential development, with the highest scenario still based on identified projects. These are not only feasible, but realistic.

We believe that Ofgem is misusing scenarios as forecasting tools. Scenarios are developed to address uncertainty in the future – Ofgem cannot use scenarios to demand a high level of certainty in generation development over the period to 2032. Such certainty is impossible to achieve. As a result, Ofgem is placing significantly greater emphasis on short term certainty rather than potential long-term development.

### **3. What are your views on SHE-T approach to optioneering, specifically relating to the routes and link capacities considered, and are there other options that SHE-T could have considered?**

Through the Needs Case, SHE-Transmission demonstrated a thorough and robust optioneering process for the Western Isles transmission project. A total of 48 options were considered, along with nine geographical corridors, using a range of AC and DC technology. We applied the principle evaluation criteria covering capacity, programmes and costs. This resulted in three options being presented to GHD for CBA purposes. This was then further expanded to six options for the ESO to evaluate, to ensure that a wide range of options were presented and considered. These were all presented to Ofgem.

As a result, there are no further feasible options that we could have considered. Our approach to optioneering is robust, seeking best value while bringing the most efficient solution.

### **4. What are your views on the CBA put forward by the ESO, particularly in relation to the results it produces?**

The ESO's Future Energy Scenarios (FES) for the Western Isles do not account for differing environmental policy impacts on the Western Isles itself. This is evident from the changes and different results between the FES 2017 and 2018. The FES are intended to be GB scenarios and clearly lack detail on current local projects, which SHE-Transmission have encapsulated in its Needs Case.

The major limitation of the industry standard CBA is that it is based on the NOA, which is not a definitive prediction but rather a "snapshot in time". We have seen that evidenced through the movement in outlook between NOA3 and NOA4 and it is almost guaranteed that the outlook will continue to change between now, energisation and continue to do so throughout the 45-year life of the asset.

Ofgem is being inconsistent and selective in its analysis used to support SWW links across the Islands. Ofgem has simultaneously published its minded to position to approve a similar 600MW link on Shetland, which SHE-Transmission believes offers the best solution. This conclusion came from similar type analysis as with the Western Isles and is further supported by both GHD and ESO.

However, Ofgem has chosen to include the Steady State (SS) Scenario in the Western Isles CBA and its application to the Needs Case, but not so for Shetland. This is despite the ESO's recognition that SS is

**inappropriate and unrealistic.** If the link will not be built because of proposed conditionality not being met, then SS has no place in the CBA and should be removed. SHE-Transmission agrees with this approach. Only credible and realistic considerations should form part of the CBA, giving a more accurate picture of the link solution and long terms benefits to the GB consumer.

## 5. What are your views on the technical design and costs of the proposed Western Isles link?

### Technical Design

As part of our August 2018 Needs Case submission, SHE-Transmission used a Cost Benefit Analysis (CBA), based on established industry constraints avoided principles and Ofgem's SWW guidance, to compare a number of reinforcement solutions. This analysis was conducted independently by the GB System Operator and our consultant, GHD, and identified our proposed option of a 600MW HVDC link to be the most economical solution across a broad range of generation development outcomes for the Western Isle (with due consideration to the conditionality proposed in the Needs Case).

### Costs

SHE-Transmission firmly disagree with Ofgem's benchmarking costs. We reaffirm that the Capex figures stated in our Needs Case and subsequent updates shared with Ofgem during the review process have been informed by tendered prices defined by the current supplier market position. Bids were obtained following a comprehensive regulated tender process spanning three years including a formal prequalification process and six iterations of the tender return. SHE-Transmission will continue to refine the project scope and realise commercial opportunities to obtain best value for the GB consumer. We have obtained significant savings since submitting our Needs Case in August 2018, which will be included in our Project Assessment submission.

In addition, supplier relationship management is a key tool which is used for strategically important suppliers to measure and improve relationships, which encourages supplier innovation and drives value from the supply chain. We believe the costs achieved through these mechanisms with the Western Isles preferred bidder are competitive and will be refined during the final stages of the tender process.

Ofgem states that additional savings can be achieved, using 'comparable' transmission assets in other areas such as interconnectors and OFTOs. However, these projects are not specific enough to make cost conclusion or assumptions to the Western Isles. We assert that these asset types are not directly comparable in areas of capacity, length, units, unique location, etc. Ofgem's analysis fails to consider the unique characteristics or challenges faced by a bespoke project such as the Western Isles Transmission link.

We have provided feedback to Ofgem in the Benchmarking Report (issued in February 2019), which has not been considered within the consultation. This report outlined the type of considerations unique to the Western Isles transmission link;



- Location – A remote island to mainland link makes access for people, plant & equipment challenging which increases cost;
- Onerous ground conditions due to the geology of the Scottish Highlands & Islands;
- Weather conditions – Severe weather can be expected that will impact on productivity and programme;
- Noise – Introducing mechanical plant to rural areas requires significant management of environmental constraints such as noise.

The data set used by Ofgem to arrive at their Capex estimate is fundamentally flawed. It assumes that using this can accurately predict or estimate the cost for the Western Isles Transmission Link. Doing so however is flawed, as the projects are very different and does nothing to address the unique issues we shared with Ofgem. For example, convertors, substations, land cables, geographical location etc. Ofgem's data set dilutes the importance of such issues highlighted and as a result reduces their commercial impact.

We also note that the only benchmark comparable project within the SHE-Transmission's TO area (Caithness-Moray) has been excluded. We consider this to be a selective exclusion by Ofgem which has resulted in a lower Capex estimate.

#### **Capex Variance between 450MW & 600MW**

Our assessment is based on a formal tender exercise, which shows a scaling factor of around 5% should apply between 450MW and 600MW. This supports our position that there are high fixed costs and low variable costs associated with the variance between capacity. Using projects of significantly higher capacity to make a commercial assessment on low capacity projects is incorrect as it does not reflect the actual commercial position demonstrated by tenders returned. Furthermore, a 5% CAPEX differential is insignificant over asset's 45-year life. In other words the larger link cost is immaterial. Whilst we appreciate that high level estimates can utilise capacity scaling to obtain generic unit rates these should not be used to assess final project costs as they do not consider project specifics.

#### **6i. Do you agree with our minded to position to reject the 600MW link conditional on only two LWP projects securing CfD's?**

No, SHE-Transmission does not agree with Ofgem's minded to position to reject the 600MW link conditional on two LWP projects securing CfD's. SHE-Transmission supports the view of the vast majority of political and industry stakeholders who see this decision as short-termism and ultimately resulting in a disbenefit to the GB Consumer.

Given the other known generation and local stakeholder support, there is a strong likelihood that, over the lifetime of the link, more than 369 MW of generation will connect. A 450MW link only allows for a further 81MW of generation to connect over the 45-year life of the asset.

SHE-Transmission has demonstrated that there is currently more than 180MW already interested in connecting to the link. To limit the industry's ability to exploit the vast natural resources on the island for the sake a short term saving in capex is nonsensical, particularly considering the analysis we have shared with Ofgem, which showed the cost of a secondary cable being in excess of £270m (PV). The additional capex required to fund a 600MW over a 450MW would be around a tenth of that.

SHE-Transmission believes Ofgem are being too short-termist in its approach to the Western Isles, rather than looking at the benefits over the asset's life, the generation potential of the Western Isles, and the overall positive impact on the island and to the GB consumer. In its attempts to be risk adverse, Ofgem are prepared to jeopardise available benefits over the long-term asset life to get the maximum benefit now, despite the additional future costs.

Furthermore, Ofgem have not considered potential increased in costs, economies of scale, programme delays and other factors that puts even the 450MW link at risk. The entire project could turn out to be a non-starter, with in development and future renewables projects being eternally constrained.

### **Wider Policy Concerns**

#### **Rejecting the 600MW does not consider UK or Scottish Government objectives.**

The Scottish Government has targets of meeting 100% of its electricity demand from renewables by 2020 and 50% of **all** of its energy from renewables by 2030. Onshore wind is considered a 'vital component' of these goals with the Scottish government declaring there is ***'no question about the dominant and hugely valuable role played by onshore wind - and we continue to see further capacity installed.'***<sup>2</sup>

In the information presented so far, Ofgem's focus has been on the least cost option – supported by scenarios that do not fully consider the additional renewable investment that the UK must make to reach its long-term carbon goals.

The UK's legally binding greenhouse gas reduction target is to reduce emissions 80% below 1990 levels by 2050. Also, in terms of regulation the government has decided, for wider economic/society reasons, to allow the islands to compete for a subsidy in the CfD auction. Ofgem is in danger of contradicting this by not providing an outcome that accommodates the transmission option that also delivers the better wider economic/society solution.

Ofgem's proposal on the Western Isles does not meet this challenge. SHE-Transmission maintains that the 600MW link offers the best long-term value and efficient solution, one that supports future

<sup>2</sup> <https://www.gov.scot/publications/onshore-wind-policy-statement-9781788515283/>



investment in renewable energy and by default further reductions in carbon and goes much further in supporting both the UK and Scottish Government targets.

**Rejecting the 600MW link does not consider the need for long-term investment.**

The 600MW option for the Western Isles will not be ‘full’ from inception but provides capacity for renewable generation to develop, benefiting the UK in terms of low carbon generation, reducing wholesale prices and benefitting the local Western Isles economy.

To consider future investment needs in an efficient manner, it is necessary to engage in strategic investments. Transmission investments are efficient when there are material economies of scale at play. It is known that large electricity infrastructure projects are characterised by economies of scale; in most cases fixed costs outweigh variable cost components. Laying a cable on the seabed is substantially insensitive to the size of the cable, as we have shown Ofgem when looking at the cost differentials between the 600MW and 450MW links.

Add to this the potential wider benefits and allowing more renewable investment over the asset life, 600MW is the only solution that makes sense.

SHE-Transmission has shown that the larger 600MW link is economically superior to a more phased approach. Especially coupled with the very small difference in CAPEX compared to Ofgem’s preferred 450MW proposal.

We are disappointed that Ofgem has not considered our analysis, along with the advice of the ESO. Ofgem’s refusal to look at the benefits of a 600 link, exposes the GB consumer to greater future costs, as a second link will be needed to accommodate further likely generation.

**6ii. What are your views on our analysis of the information, which suggests a 450MW link would represent the best outcome for existing and future consumers if only two LWP projects secure CfD’s?**

SHE- Transmission maintains that the CBA should be analysed through the lens of our proposed conditionality meaning that Ofgem should remove the Steady State scenario as this assumes a level of generation lower than the combined output from the LWP (369MWs). In doing so, the option of least worst regret (LWR) becomes 600MW. Hence in a world where LWP are successful in the CfD auction the option of LWR from the range of **viable scenarios** in the CBA becomes 600MW.

SHE-Transmission maintain that SS should not be considered as a viable scenario due to the conditionality recommended in our Needs Case, a view which is supported by the conclusion in the ESO’s original report:

***“SHE-Transmission are submitting a needs case to Ofgem based on the 600MW HVDC cable (option 2), on the conditional aspect that CfD’s are awarded to some of the major projects on the island. The SO***

***would agree with this approach as the awarding of these CfD's would eliminate SS as a viable future on the Western Isles and change the LWR answer to option 2."***

Construction of the link will be triggered only when both LWP projects have been successful in the 2019 CfD auction, which then negates SS and there is no cost to the GB consumer. If a major project drops off post construction, there are significant securities and liabilities which the developer would face at every stage of construction. These are such that they protect the GB consumer.

SHE-Transmission firmly believes that the results of the CBA, taking into consideration only those scenarios that have ANY likelihood of materialising, points to the 600MW link being the correct technical solution to meet the identified need on Western Isles.

### **6iii. Do you consider that consumers could be appropriately protected from the costs of funding a potentially significantly oversized link if we were to approve the needs case for a 600MW link? If so, how could this be achieved?**

In the context of "protecting consumers from the risk of the link being oversized", SHE Transmission maintain that the consumer is protected once the capacity of the link has exceeded the point where the NPV of the theoretical constraint costs are outweighed by the NPV of the link's capex. Once this capacity has been reached the consumer is protected. For a 600MW link this value is no more than 156MW of generation.

Our original proposed conditionality of 369MW provides a generous buffer over this breakeven point as such that the consumer is not only "protected" from oversizing but is in fact being provided with additional benefits from this link that would be lost by a smaller size cable. We believe this is by no means the limit of generation that will come forward over the life of the link, and maintain that within c6 years, on the balance of probabilities, our analysis shows that 550MW could be achieved. On this basis, by reviewing the Consumer Welfare analysis under both the NOA3 and NOA4 background we can see that to build a 450MW link would result in the consumer being denied access to the additional benefits of at least £100m compared to those that a 600MW link would provide.

SHE-Transmission firmly believe that consumers are not just appropriately protected, but a 600MW link offers considerable long-term benefits over and above Ofgem's limited, inconsistent, pessimistic and narrow-minded approach to SWW Island's links, especially in the instance of the Western Isles. We maintain that switching to a 450 link does protect the consumer in both the short and long term, especially given current generation, future generation potential and the delay cost implications.