

**To:** Mr James Norman, Head of New Transmission Investment, Ofgem  
**From:** John Tulloch, BSc (Hons), MIET  
**Address:** Lyndon, Arrochar G83 7AG  
**Submission:** "Shetland transmission project: Consultation on proposed Final Needs Case and Delivery Mode"  
**Date:** 9 June 2020

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## **1. Introduction**

**Ofgem is charged with facilitating decarbonisation while ensuring value for consumers' money. Its website states:**

*"Our principal duty is to protect the interests of...consumers. This...obliges us to evaluate almost any situation or proposed change through the lens of energy consumers."*

**However, fuel poverty in Shetland stands at 53 percent of homes. Versus 25 percent in Scotland and 10 percent in England (Appendix 12). Why?**

**Lack of competition for the electricity/oil duopoly is a primary cause. There is no public gas supply. Energy is needlessly expensive, in the cold, northern climate.**

**Ironically, billions of pounds worth of low-cost gas is pumped ashore from gas fields west of Shetland en route for consumption elsewhere. Yet not a single molecule has been made available for Shetland consumers.**

**A further irony is the heavy subsidy of Shetland's electricity by mainland consumers. A subsidy that would be substantially reduced by the availability of locally-based gas for electricity generation and heating demand.**

**A gas-based alternative to a grid link has yet to be rigorously evaluated and Ofgem's "minded-to" decision to approve SSEN's 600MW subsea cable threatens to make permanent the above inequitable state of affairs.**

**Clearly, Ofgem's stated "*principal duty*" is not being fulfilled in Shetland.**

Brexit, "Net Zero 2050" and the Coronavirus pandemic present major challenges that together impact powerfully on the need for cost-effectiveness. Consumers' money is not unlimited and money not wasted can be used for emissions reduction elsewhere.

Generation built outside the CfD scheme e.g. contracted directly to oil and gas rigs, cannot – and should never – attract constraint payments from GB consumers.

Oil and gas companies requiring a supply dependent on the public electricity system should face the same costs as other supply applicants, including network reinforcement. Otherwise, GB consumers would be subsidising fossil fuel extraction, in direct conflict with 'net zero 2050'.

The present situation transpired because SSE's original Rova Head proposal was rejected on competition grounds and the ensuing "competition" failed to produce a cost-effective solution.

SHE-T then proposed its 600MW subsea cable which, like Rova Head, did not feature in the competition. That is understandable. Why enter a profit-razing '*Dutch Auction*', if you don't have to? You might lose.

However, Danish power specialist BWSC has proposed a low-cost, LNG-based alternative that fully addresses Shetland energy consumers' needs.

A rigorous evaluation of two competing alternatives is now possible; namely, to maintain Shetland as an isolated, island system; or to install a tenfold overcapacity grid link at ten times the capital cost.

The ESO's cost-benefit analysis is deeply flawed. It relies on false assumptions; notably, that no alternative exists; that massive wind farm development would take place without a link; and that discontinued ROCs prices are an appropriate basis for estimating constraint costs for future generation. Moreover, both the future generation and oil and gas demand scenarios appear to be, at best, speculative.

Taken together these flaws render the analysis a travesty.

No transparent analysis has been provided of future constraint payments to Scottish wind farms. The Scotland-South interconnector links have already proved inadequate with constraint payments currently at record levels, exacerbated by repeated failures of the Western Link, currently under investigation by Ofgem.

The proposed Shetland grid link will be a single, unburied cable passing through busy shipping lanes and prolific, international fishing grounds in notoriously stormy seas. The risk of fouling, storm damage and technical failures akin to those of the Western Link is thus high.

Adding to existing border problems with new generation on Shetland, on top of offshore wind farms already under construction, would seem ill-advised, begging the question, why would corporations invest in such remote renewable generation, behind a vulnerable link?

Expert commentators have observed that developers are incentivised to build behind grid constraints, giving them market power to boost their income by entering high constraint bids, leading to higher income for being constrained than for actually generating.

The impending end of the Transmission Constraint Licence Condition (TCLC) which helps to restrain excessive bidding is thus a matter of concern.

Finally, missing from all analyses relating to Shetland's future energy supply is a rigorous evaluation of a "*no cable*", gas-based solution. Thanks to BWSC's latest proposal, it is now possible to remedy that glaring omission.

## **Question Responses.**

**Question 1:** *What are your views on the generation scenarios developed and updated by SHE-T? We are particularly interested in views on the likelihood of wind generation on the Shetland Isles developing to the levels predicted by SHE-T's scenarios and any further changes or updates since SHE-T's October 2018 Final Needs Case submission that you think should also be considered.*

**Response:** To date no Shetland wind farm has won a CfD auction contract. Even the biggest, Viking Energy Wind Farm (VEWF), immediately adjacent to the future Kergord grid supply point, has failed. The others lack its economies of scale and need additional HVAC links, two requiring several miles of subsea cable plus around 40-50 miles of onshore lines/cabling.

Given the competitiveness of the offshore wind sector and the expected advent of new technologies like floating wind and small-scale nuclear reactors (Appendix 5), it is not at all clear that VEWF will ever win a contract, far less, any of the smaller developers. This is reinforced by VEWF's own statements.

In 2013, Shetland Islands Council and local parliamentarians lobbied government for a special £115/MWh "*Island Strike Price*" that VEWF claimed was essential for viability (Appendix 6: VEWF letter to Ofgem).

However, the latest CfD auction results came in around £40/MWh, just over one third of the 2013-proposed island strike price.

It is difficult to see how

- (a) VEWf project costs could be reduced by two thirds, to enable a viable, auction-winning bid, now.
- (b) The other, smaller proposals will fare better than VEWf.

Not least, because the cost of this proposed grid link, with its transmission network charges and power losses, will add significantly to the cost of electricity imported or exported.

Conclusion: SHE-T's future generation scenarios are unlikely to transpire.

## **Question 2:** *What are your views on the demand sensitivity explored by SHE-T?*

**Response:** Some oil and gas (O&G) majors have stated commitments to “net zero 2050” (NB for 2050, not 2020).

First, O&G operators avoid using diesel for production power if they possibly can. They routinely use wellhead gas. It costs virtually nothing and if it would otherwise be flared, it is effectively emission-free.

Production shutdowns are expensive, so why switch to expensive renewable energy from the unreliable, overhead line-dominated, public electricity network?

If oil companies switch to using subsidised renewable energy it would have the undesirable side effect of GB consumers subsidising fossil fuel extraction.

Second, all the O&G companies need do to achieve net zero emissions is invest in renewable energy projects. For example, Shell has announced its intention to become a global energy utility, heavily invested in renewables. Mission accomplished! (Appendix 7)

Underlining this point, Total recently bought a majority stake in SSE's Seagreen Wind Farm in the Firth of Forth. The investment should make money from green energy while helping to demonstrate progress towards “net zero 2050” (Appendix 7).

New technology is likely to intervene here, too. The now likely advent of small scale modular (nuclear) reactors (SMRs), led by Rolls-Royce, will surely be attractive to O&G companies. Indeed, one could see this fitting very well into oil majors' plans to move into the electricity supply business, with themselves as their own, major customers (Appendix 5).

Meanwhile, given the oil price crash, their primary focus is on cutting costs, not increasing them.

Given that connection of O&G demand to intermittent renewable energy is impossible without a grid connection, O&G companies applying for a supply dependent on the public electricity network should pay for their share of the necessary reinforcement, just as other consumers would have to do (Appendix 8).

Otherwise, GB consumers would be subsidising fossil fuel extraction.

Conclusion: Projections of 200MW O&G demand are speculative.

**Question 3:** *What are your views on the link options considered by SHE-T? We are also interested in views on the options proposed by SHE-T to mitigate against the risks of a second link being needed.*

**Response:** The CBA (see Question 5) has failed convincingly to establish that a grid link is necessary at all. Certainly, not for security of supply, which on-island plant has provided for a century and the option of a gas-based, no cable solution has never been properly evaluated.

Loaded with false assumptions and with its data obscured by virtual blanket redaction, it is impossible to form a judgment on the validity of the CBA's conclusions.

Fortunately, an opportunity has presented itself. Danish power specialist BWSC, has reportedly proposed a gas-based solution at a much cheaper price than SSE's rejected Rova Head plant. A rigorous comparison of a grid link versus a gas power station is now possible.

Regarding the link options, both the future generation and demand scenarios are unlikely to transpire (please refer to the responses to Questions 1 and 2 for detail).

Given that the need for a first grid link has not been established, consideration of a second link is unnecessary.

**Question 4:** *What are your views on the technical design and costs of the proposed Shetland link?*

**Response:** A single, subsea cable link is a precarious basis for ensuring security of supply. Failures can take weeks or even months to repair and can be especially costly where substantial consumer demand and export of energy are concerned.

A fully-specified standby plant is imperative. Based on the 2017 NGSSL-Aggreko proposal you assume the cost of that will be £24.6 million.

However, the original NGSSL-Aggreko plan was to install a fleet of portable diesels in a field adjacent to the existing Lerwick Power Station, at the North end of Lerwick.

Difficulties may be expected in obtaining planning permission for a facility that could spew 30-50MW worth of carcinogenic diesel fumes over Lerwick for weeks at a time. What smokestack arrangements are planned for the 40-50 portables?

That is the main complaint with the existing plant – the town has grown to meet it. At the least, moving the standby plant to a different location will add substantially to the cost.

At what point will the standby plant cost be incorporated into the cost of the overall project i.e. the 600MW cable, VEWf wind farm and standby plant, taken together?

This cost cannot be avoided and *somebody will have to pay* for it. In the interests of transparency, it must be included in the total cost attributable to consumers.

Expect the standby plant cost to rise substantially if you approve the cable project. You will have little option but to accept the cost, as it will be an essential component of the overall package which must be in place, by your own ruling, by 2025.

The greatest risk to subsea cables is fouling by ships' anchors and fishing vessels' trawl gear. (Appendix 9).

Technical failures also occur. Witness the fiasco of the Western Link interconnector, intended to transport Scottish renewable energy to North Wales, currently under investigation by Ofgem. (Appendix 9).

Shetland waters are prolific, international fishing grounds and are notoriously stormy. Ships often heave to in storms and drop anchors, sometimes forgetting to raise them when they move on.

In 1993, the crippled oil tanker *Braer* dragged her anchors a long way before finally grounding at Garths Ness, Shetland and in 2017, a major cross-channel interconnector was badly damaged by emergency anchoring (Appendix 9).

Failures can be costly. Western Link failures, compounded by low demand due to the coronavirus pandemic led to the recent record constraint payments made to Scottish generators.

Such analysis as has been provided of the effect on constraint payments has been shielded from view by massive redaction of data. However, it is clear that the Scotland-South interconnector links have already proved inadequate with unprecedented constraint payments currently being made.

With offshore wind farms e.g. 950MW Moray East, also under construction, it would seem unwise to add yet more to Scotland's already top-heavy renewable energy portfolio by approving this grid link to Shetland. Constraint payments will surely rise ever higher, all charged to consumers' bills (Appendix 10).

And why build wind farms in such a remote place, behind a vulnerable link?

Expert commentators have observed that developers are incentivised to build behind grid constraints, giving them market power to boost their income by entering high constraint bids, leading to higher income for not generating than for generating.

The impending end of the Transmission Constraint Licence Condition (TCLC), which provides some restraint is a matter of concern, regarding which Ofgem states (Appendix 11):

*“4.3. Once the TCLC ceases to have effect there will be no explicit licence restrictions on generators” dispatch decisions or on their bidding behaviour in the BM. “*

#### **Question 5:** What are your views on the CBA put forward by the ESO?

**Response:** As ESO, National Grid (NG) is entrusted to determine what transmission network modifications consumers will pay them to install and operate.

NG has a vested interest in increasing renewable generation in Scotland. For example, a grid link to Shetland to connect renewable generation will cause increased constraint payments due to cross-border congestion. More interconnector capacity will be needed to accommodate, not only, Shetland generation, but also offshore wind farms already under construction, leading inexorably to higher income for NG.

The modelling ostensibly covers the effect on UK-wide constraint costs resulting from the proposed link/generation however there are many serious issues.

- Sweeping redaction of cost/NPV figures has rendered the CBA incomprehensible.
- The main assumptions are false, namely:
  1. No alternative exists. This is plainly false. On-island plant has done the job for a century.

Despite its inherent, low-cost nature, the option, “*No cable*”, plus a gas-based solution, has not been rigorously evaluated versus the other alternatives.

Without that and sight of important cost/NPV data, it is impossible to determine whether a grid link is the best value option.

2. The “*counterfactual*” assumes generation scenarios will be implemented, even if there is no link. That is absurd:
  - (a) SSE has stated that its isolated Shetland system cannot accommodate any additional, intermittent generation,
  - (b) CfD auction bids must specify delivery years. Having placed a winning bid, bidders must have a Connection Agreement in place

prior to signing a contract. However, no Transmission Operator could sign such an agreement without a grid link.

It also creates the misleading impression that not installing a grid link could be costly. That has not been established. The “no cable” option has not been properly evaluated.

3. The CBA uses both ROCs and CfD prices for modelling “constraint” costs. However, the ROCs system was replaced by CfD auctions in 2015.

All new, subsidised wind farms on Shetland will be under CfD contracts. It follows that CfD prices should apply. Indeed, NG has indicated its intention to switch to using CfD prices during the next year.

Existing ROCs-contracted generation in Shetland is not, and will not be, constrained in the continuing absence of a grid link.

ROCs prices are thus irrelevant and calculations based on them should be eliminated.

The effect of eliminating ROCs-based cases is revealing. From the final paragraph of the CBA Conclusions (page 21):

*“Many of the cases result in negative NPVs, with several cases showing all combinations of link option and generation scenario producing negative NPVs. This is the consequence of the modelling of the Round 3 auction CfDs and oil and gas demand on Shetland.”*

NB Negative NPVs mean “no cable” represents “better value for consumers” than the options considered.

Given the above issues the LWR analysis cannot be considered a credible assessment.

However, it is seen from the tabulated results (Table 16, page 19) that If irrelevant ROCs-based cases are eliminated, Option 1 (450MW or smaller, or no cable) wins every time, further undermining the case for a 600MW link.

Large numbers of negative NPVs and the LWR study showing 450MW or smaller as the preferred option should be ringing alarm bells that something is far wrong with SHE-T’s 600MW grid link proposal.

**Question 6:** What are your views on other approaches we have taken to assess the costs and benefits to GB consumers?

**Response:** The problems with the CBA (Question 5) and blanket redaction of data render the LCOE and tipping point/sensitivity analyses impossible to assess and ultimately, irrelevant.



Once again, no LCOE analysis of a gas-based, “no cable” alternative is provided for comparison, without which the entire “minded-to approve” decision lacks credibility.

**Question 7:** What are your views on our minded-to position to conditionally approve the revised Final Needs Case? Specifically:

1. i) Do you agree with our proposal to approve a 600MW link subject to Ofgem being satisfied, by the end of 2020, that Viking Energy Wind Farm is likely to go ahead?
2. ii) Do you have any views on the type of evidence we should expect to see that would confirm that Viking Energy Wind Farm is likely to go ahead?
3. iii) Do you agree with the factors we have considered to reach our minded-to position?
4. iv) Are there any other factors that you consider we should take into account when assessing this proposal?

**Response:**

1. Disagree. Please refer to Question 5 for detailed discussion of the CBA.

Briefly, the CBA has many flaws and is not a reliable basis on which to approve the spending of such a colossal sum of consumers’ money.

There has been no rigorous comparison of the obvious alternative of “*no cable plus a gas-based solution*”.

The number of negative NPVs appearing in a study so loaded towards approval should be ringing alarm bells that all is not well with SSEN’s subsea grid link proposal.

2. Yes. VEWf has no CfD contract and no prospect of winning one in 2020. Approving the link without a contract would be gambling with consumers’ money.

The only way it can go ahead is on a merchant basis, possibly, in conjunction with a directly negotiated contract with oil and gas companies. As explained in Question 2, that is unlikely.

Obviously, any such arrangement outside the CfD system should not attract constraint payments. Otherwise, GB consumers would be subsidising fossil fuel extraction.

A CfD contract itself is no guarantee that the project will proceed as the penalties for failure to fulfil contracts are relatively small.

The proposal should not be approved at all. However, should you decide to approve it, the evidence must include payment of a large deposit (bond?), say, 25 percent of the project cost, to be forfeited should the project not proceed.

3. Disagree. The cost benefit analysis (Question 5) is a travesty. In particular, the assumption that no alternative exists is plainly false. The notion that the generation scenarios will proceed without a grid link, purely to claim constraint costs, is absurd.

Substantial emissions progress could be achieved for a fraction of the cost of the grid link. Consumers' money is not unlimited and money not wasted can be spent on efficient emissions reduction, elsewhere.

O&G companies will have several competing options for decarbonising their supplies (Question 2) and are unlikely to fulfil SSEN's projected demand scenarios.

As it stands, approval would leave Ofgem vulnerable to the criticism that it is facilitating carpet-bagging entrepreneurs seeking to cash in on renewable energy subsidies, as opposed to ensuring best value for consumers.

4. Yes, other factors should be included in your analyses.

In particular, neither SHE-T's proposal nor the glaringly obvious alternative of a gas-based, no cable solution has been properly evaluated. However, an opportunity presents itself.

Danish power specialist BWSC, partnered by Shell subsidiary Gasnor, has proposed a low-cost, gas power station reportedly costing a fraction of the cost of SSEN's tenfold overcapacity grid link.

The SHE-T and BWSC-Gasnor proposals must now be rigorously evaluated, comparing "apples with apples", to assess their respective costs and benefits before any credible decision can be taken.

**Question 8:** Do you agree with the findings of our analysis?

**Response:** No comment.

**Question 9:** Are there any additional factors that we should consider as part of our analysis and/or decision on whether to apply the CPM for the Shetland transmission project?

**Response:** No comment.

## Conclusions

The starting point of this submission was the observation that Ofgem is failing to fulfil its own stated duty in Shetland, namely, to protect the interests of consumers (Appendix 4). Despite gas coming ashore in Shetland from gas fields, it continues to be excluded from competition with the established oil/electricity retail duopoly.

The cost-benefit analysis for SHE-T's 600MW cable is based on false assumptions, rendering it a travesty. In particular, a grid link is not the only practical solution. Nor is one essential for security of supply. A gas-based, no cable solution is an obvious alternative and one has been proposed by power generation/LNG specialists BWSC-Gasnor.

The absence of rigorous, independent evaluations of both SHE-T's grid link proposal and a 'no link', gas-based solution is a glaring omission that would seriously undermine the credibility of any decision to proceed, possibly, even, leading to court action, from disgruntled parties.

Such an evaluation of the 2017 competition entrants was carried out and there is no reason why a similar exercise cannot be undertaken for the current, competing proposals from SHE-T and BWSC-Gasnor.

It must be done and it must be credible. The credibility of the entire process and indeed, of Ofgem's reputation as a champion of consumer value are at stake. It must be independent with a high degree of openness and transparency.

## **"General feedback**

### **Ofgem document**

1.61. We believe that consultation is at the heart of good policy development. We welcome any comments about how we've run this consultation. We'd also like to get your answers to these questions:

1. Do you have any comments about the overall process of this consultation?

No comment:

2. Do you have any comments about its tone and content?

Yes. The content does not consider all the available options for Shetland's future energy supply, notably, a no cable, gas-based solution.

The CBA is an exceptionally poor basis on which to justify spending such a colossal sum of consumers' money (see Question 5).

3. Was it easy to read and understand? Or could it have been better written?

No. It was not easy to understand. There is no list of acronyms and a dearth of tabular/graphic information. Both would be very helpful.

The findings of the ESO's very poor CBA appear not to have been accurately communicated e.g. Table 16, page 19 of the CBA does not support the idea that a 600MW link is the "best value option".

4. Were its conclusions balanced?

No. Its conclusions were not balanced.

Ofgem's "minded-to" decision supports the 600MW cable proposal, despite the poor quality of the CBA (please refer to Question 5) and the fact that, if cases based on obsolete ROCs prices are eliminated, none of the LWR results support that option (CBA: Table 16, page 19).

The massive redaction of data in the CBA and associated analyses i.e. LCOE, etc. rendered it impossible to assess the validity of their conclusions.

The excuse offered is "*commercial sensitivity*" however for many of the assumptions/figures affected this is highly questionable and, in any case, the public interest must surely overrule commercial sensitivity in all but the most special cases. Especially, when there is no competition for particular proposals.

The principle of "open competition" would then apply more than it does, today.

*Even if we accept the CBA*, the number of negative NPVs (and LWRs that support the 450MW option or smaller, or even no cable at all), should be ringing alarm bells that something is far wrong with, not just the 600MW link proposal, but the entire notion that a subsea cable link is an appropriate solution.

In all the deliberations to date, there has been never been a rigorous analysis of a "no cable, gas-based solution" however an opportunity presents itself with the recent proposal by Denmark's BWSC-Gasnor.

It is now possible to make a rigorous, "apples with apples" comparison of the BWSC-Gasnor offer with the proposed transmission link. That opportunity must not be missed.

5. Did it make reasoned recommendations for improvement?

None that I am aware of.

6. Any further comments

No comment.

## 5. Appendices

### Appendix 1: About the Author

Recently retired from a large UK utility, following nearly 40 years in a variety of technical, engineering and managerial roles; 21 years in isolated, island diesel power stations; latterly, in its renewable energy division (12 years); plus 6 years in power distribution.

For avoidance of doubt, my work is pro bono. I have no 'axe to grind' and am acting as a concerned consumer and taxpayer, with considerable relevant experience in a field I continue to find stimulating in retirement.

### Appendix 2: Economic Factors/Cost-effectiveness

The UK has left the EU and intends to compete in world markets with free trade as a core feature of its strategy, outside the shelter of EU protectionism. Manufacturing industry will be important and affordable energy is vital to successful manufacturing.

The cost of the “net zero 2050” target has been variously estimated between £1-3 trillion. It is a challenging objective. Consumers and taxpayers will foot the bill.

The economic consequences of the coronavirus pandemic will be devastating. In particular, government spending has soared to unsustainable levels, merely to cushion the blow. Colossal spending will be required to revive the economy, leading to higher borrowing and taxes. Mass redundancies and lower pay for workers will likely result, as in 2008/9 and poverty, especially, fuel poverty will rise substantially with major political ramifications.

**NB** Net zero represents aggregate emissions for the entire UK – by 2050, not 2025. Ultimately, some locations will finish above, and some below, zero.

Given that consumers’ money is not unlimited, locations such as Edinburgh, Grangemouth, Shetland must contribute to the national project in the most cost-effective way possible. Money not wasted may then be used more effectively for further emissions reduction initiatives, elsewhere.

Failure to act cost-effectively could put “net zero 2050” itself at risk of dilution, or even, abandonment.

### **Appendix 3: Background:**

SSE originally proposed a gas-fired power plant at Rova Head, Lerwick, costing £200 million. It was rejected by Ofgem on competition grounds and SSE was instructed to run a “competition” to obtain the best solution on the market.

Remarkably, both the winner (NGSLL-Aggreko 60MW distribution link) and runner up (a heavy fuel diesel power station) offered worse value than SSE’s original proposal which, bizarrely, was not entered. The winning solution was rightly rejected.

Despite the VEWf project’s well-known need for a grid link (VEWF initiated in 2003), SHE-T’s proposed 600MW transmission link was also not entered in the competition.

Danish power specialist BWSC reportedly attempted to propose a gas-based solution but was unable to obtain a guarantee of gas supplies from Shetland Gas Plant, in which SSE holds a 20 percent stake, despite it having previously agreed to supply SSE’s (rejected) Rova Head plant.

Now BWSC is back, in partnership with Shell subsidiary Gasnor, proposing a gas power station, fuelled by LNG imported from Norway, at less than a third of the capital cost of SSE’s Rova Head plant.

Had Rova Head and the 600MW link been entered, a full analysis of their costs and benefits, on the same basis as competition entrants, would be available.

As it stands, neither SHE-T's 600MW link nor a gas-based solution has been rigorously evaluated. All we have is the exceptionally poor quality ESO CBA for the 600MW link plus some fiddling with levelised costs (LCOE) and sensitivities. That is a glaring omission.

#### **Appendix 4: Ofgem Purpose:**

*"Our aim is to make a positive difference for energy consumers, and our principal duty is to 'protect the interests of existing and future consumers'. This informs our whole approach to regulation in Great Britain and the way that we work with stakeholders. It obliges us to evaluate almost any situation or proposed change through the lens of energy consumers."*

*"Consumers are of all types, including: households, micro-businesses, SMEs, public sector and voluntary bodies, and industrial and commercial companies. All of these consumers are affected by what happens across the energy value chain."*

Under **"Our Priorities"** it states:

*"In delivering...(our)... strategy, consumers and stakeholders can expect us to:*

- *facilitate decarbonisation efforts to deliver a net zero economy at the lowest cost to consumers.*
- *protect consumers, especially the vulnerable, by stamping out sharp practice and ensuring fair treatment.*
- *enable competition and innovation, which drive down prices and result in new products and services."*

<https://www.ofgem.gov.uk/about-us/our-priorities-and-objectives>

#### **Appendix 5: New Technology: Small Modular (nuclear) Reactors**

<https://www.thisismoney.co.uk/money/news/article-8417289/Rolls-Royce-triggers-250bn-nuclear-mini-reactor-race.html>

#### **Appendix 6: VEWf Letter: to Ofgem re Island Strike Price**

<https://www.ofgem.gov.uk/ofgem-publications/88876/vikingenergyresponse.pdf>

#### **Appendix 7: Oil Majors Diversify Into Renewable Energy**

Shell to Become Global Utility

<https://www.ft.com/content/87cfc31e-44e7-11e9-b168-96a37d002cd3>

'Total Oil' Purchases "Seagreen" Wind Farm Stake

<https://www.ft.com/content/45681b2e-75de-46fa-923b-970959ad0864>

## Appendix 8: Cost of New Supply Connection

Statement of Methodology and Charges for Connection to Scottish Hydro Electric Power Distribution PLC's Electricity Distribution System Version 1.31 – 1st April 2020

<https://www.ssen.co.uk/Library/ChargingStatements/SHEPD/>

Given that O&G demand cannot be connected to intermittent renewable energy without a grid link, the O&G companies should pay for their share of the costs, not GB consumers.

### ***“National Grid Electricity Transmission (NGET) Charges***

43. 5.43 *We have an obligation under the CUSC to discuss certain requests for connection or changes in connection with NGET. Such requests are typically for large electrical demand or generation projects. Under certain circumstances, as determined by NGET, they may apply charges to assess the potential impact on the transmission system of a request or the combined effect of a number of requests and these will be included in the Connection Charge, or through a separate mechanism agreed between you and us.*
44. 5.44 *Subsequent to such assessment NGET may also require works to be undertaken on the GB Transmission System as a condition of the connection being permitted. In the event of NGET applying charges for these works, we will reflect these charges in our charges to you.*

*“5.44A Should GB Transmission System works be required, NGET may apply a cancellation charge in the event that your project is cancelled or the capacity of your project reduces. NGET also calculates a secured amount in respect of this cancellation charge (being a percentage of the cancellation charge, which reduces at certain trigger points). We may ask you for security in respect of this cancellation charge, but we will not ask you for more than the secured amount calculated by NGET. “*

## Appendix 9: Subsea Cable Threats/Failures

1. “Fishing Activities: One of the most cited cause of power cable failures is fishing activities, which generally result in trawling of cables and destruction by the anchors being dropped during fishing activities. **In most reports reviewed there is a general consensus that fishing activities ranks as the highest cause of subsea power cable failure.**”  
<http://blog.bisgrp.com/reasons-why-subsea-power-cable-fails-ways-on-how-to-reduce-power-cable-failure/>
2. Grounding of Crippled Oil Tanker Braer on Shetland (1993):  
[https://en.wikipedia.org/wiki/MV\\_Braer](https://en.wikipedia.org/wiki/MV_Braer)
3. Skaggerak 4: <https://en.energinet.dk/About-our-news/News/2020/04/22/Energinet-and-cable-supplier-take-samples-of-faulty-Skagerrak-4-cable>

4. Skaggerak 4: <https://en.energinet.dk/About-our-news/News/2020/04/22/Energinet-and-cable-supplier-take-samples-of-faulty-Skagerrak-4-cable>
5. Western Link: <https://www.ofgem.gov.uk/publications-and-updates/investigation-national-grid-electricity-transmission-plc-and-sp-transmission-plc-and-their-compliance-obligations-relating-western-hvdc-subsea-link>

## **Appendix 10: Moray East Offshore Wind Farm Extension (2017 Auction)**

“The 950MW Moray East offshore wind farm...was a successful participant in the UK’s second ‘Contract for Difference’ (CfD) auction.....”

“In 2017 it won a 950MW contract for difference at competitive auction which set the price of power generated at £57.50 per MWhr, and will be delivered early in the next decade.”

“Construction on the project started in winter 2018, with commencement of the onshore works”. <https://www.morayeast.com/project>

## **Appendix 11: TCLC Sunset Clause**

“4.1. Section 23 of the Energy Act 2010 requires that the TCLC must cease to have effect after the end of the period of 5 years beginning with the date on which section 18 of the Energy Act 2010 comes into force. Section 18 came into force on 16 July 2012. There is the possibility of a 2 year extension by the Secretary of State.

4.2. Ahead of the TCLC ceasing to have effect, we will review the degree to which market developments have reduced or eliminated the need for the TCLC. This process will include seeking the views of DECC, generators and other interested parties. Following that review process, the Secretary of State may consult on whether to extend the TCLC for a further 2 years.

*4.3. Once the TCLC ceases to have effect there will be no explicit licence restrictions on generators’ dispatch decisions or on their bidding behaviour in the BM. However, Ofgem will continue to monitor the BM and the market as a whole in line with its powers and duties under UK and EU competition law and under any other relevant powers (such as REMIT)."*

## **Appendix 12: Fuel Poverty:**

1. England 10.3 percent (page 1); Scotland 25.0 percent (page 65)

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/882404/annual-fuel-poverty-statistics-report-2020-2018-data.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/882404/annual-fuel-poverty-statistics-report-2020-2018-data.pdf)



**2. Shetland Islands Council, 2016 (bottom left):**

# Priority: Money

All households can afford to have a good standard of living



## Income

97.4%

of people aged 16-74 are registered as being in employment or full time education

Overall, the average annual (median) income in Shetland is **11%** higher than the Scottish average

11%

The average income in Shetland varies by area



some areas earn, on average, up to **13% less** than the Scottish average and others up to **29% more**

65%

of households in Shetland are 'working households' where everyone between the ages of 16 and 64 are in employment, the highest proportion in Scotland

we have high average incomes and low levels of registered unemployment, however, we have high levels of 'under-employment' and average incomes are lower in more remote areas

21.3%

of people in Shetland are 'under-employed' (they would like to work more hours given the opportunity to do so), 13% higher than the Scottish average

## Cost of living

£

the cost of living in Shetland is

**20% - 60% higher**

than the UK average



Shetland Foodbank distributed an average of 45 food parcels a month in 2017, a **27%** increase from 2016

5.7%

of children in Shetland are living in low income families... the high cost of living in Shetland means that many more may be in financial hardship

the cost of living in Shetland is very high and despite our relatively high average incomes, many people do not earn enough to have an acceptable standard of living

49%

of households in Shetland do not earn enough to live well

53%

of households in Shetland spend over 10% of their household income on energy bills

11%

of households in Shetland receive support with housing costs

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SOURCES: Employment, Census, 2011; Median Incomes, CACI, 2016; Working Households, Office for National Statistics, 2016; Under-employment, Annual Population Survey, Scottish Government, 2016; Cost of Living, Minimum Income Standard, Highlands & Islands Enterprise, 2016; Living Well, Living Well in a High Cost Economy, Ipsos Mori, 2017; Fuel Poverty, Scottish House Condition Survey, 2014 / Fuel Poverty Survey, Shetland Islands Council, 2016; Low Income Families, HM Revenue & Customs, 2015; Shetland Foodbank, 2017; Housing Costs, Shetland Islands Council, 2017. Map reproduced by permission of Ordnance Survey on behalf of HMSO. © Crown copyright and database right 2018. All rights reserved. Ordnance Survey Licence number 100024344.

<https://www.shetland.gov.uk/communityplanning/documents/180801SPPforWebFINAL.pdf>