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27 October 2014

Colleague,

**Consultation on our assessment of the Caithness Moray transmission project**

- We are consulting on our assessment of the efficient cost of delivering the Caithness Moray transmission project in the north-east of Scotland.
- We propose this is £1,062.3 million – we don't think the project cost of £1,236.2 million SHE Transmission proposed is justified on the evidence presented.
- We are seeking your views on our project assessment and proposed efficient costs, and ask these are sent to SWW@ofgem.gov.uk by 24 November 2014.

In July we published our decision to accept the needs case for the Caithness Moray transmission project (CM project) proposed by Scottish Hydro Electric Transmission plc (SHE Transmission) subject to there being no material increase in project costs. We are now seeking views on our assessment of the project costs that SHE Transmission is able to recover from consumers.

Based on our assessment of the information provided by SHE Transmission on the CM project, we propose:

- the Strategic Wider Works (SWW) output[1] is an additional 795MW and 850MW of transfer capacity across the respective transmission system boundaries B0 and B1 to be completed in 2018; and
- an allowed expenditure of £1,062.3 million for the efficient costs of delivery.

Our proposed efficient cost is £173.9 million lower than SHE Transmission's estimate.

The consultation period for this project assessment is four weeks. This follows our consultation and decision on the needs case that looked at the wider aspects of the proposal. A four week response period will allow us to reach a final decision by the end of the year and adjust SHE Transmission's 2015/16 revenues for the project in January 2015.

**Consultation questions**

We are seeking your views on this project assessment, our consultant's report and our proposed efficient cost for SHE Transmission to deliver the CM project. We particularly welcome your views on the following questions:

- Based on the information in this consultation and our consultants' report, do you agree with our assessment on the proposed efficient costs for the CM project?

[1] Large transmission projects to reinforce the existing transmission system or extend the transmission network are called Strategic Wider Works (SWW) outputs in the electricity transmission price control, RIIO-T1. SWW outputs are specified as increases in the electricity transfer capability in accordance with the National Electricity Transmission System Security and Quality of Supply Standard (NETS SQSS).

- What are your views on the arrangements for dealing with uncertainty on the outturn costs?
- What are your views on updating SHE Transmission's revenue model in January 2015 instead of November 2014 so that the allowed expenditure for the CM project is incorporated into the company's 2015/16 revenues?
- Do you have any other comments or information relevant to our assessment?

**SWW arrangements and the Caithness Moray transmission project**

As part of the RIIO-T1 price control[2], we introduced the SWW arrangements. These allow us to adjust the expenditure a transmission owner is allowed to make when delivering new transmission projects. When considering a SWW proposal, we first assess the needs case, then conduct a project assessment.[3]

In 2013, SHE Transmission submitted a proposal for a new transmission project in the north-east of Scotland. The reinforcement involves a high-voltage direct current (HVDC) subsea cable between Caithness and Morayshire. There are also related onshore works. It will deliver an additional 795MW of transmission capacity across the transmission system boundary B0, and 850MW across boundary B1. The additional transmission capacity is needed by 2018 to allow around 1.2GW of renewable generation to connect.

We have assessed and consulted on the need for the overall CM project under the SWW arrangements.[4] In July, we published our decision on the needs case.[5] On the basis of the information provided by SHE Transmission, the review undertaken by us and our consultants, and stakeholders' consultation responses, we endorsed the proposed project, and the need for SHE Transmission to complete it by 2018. We also said we would consider the efficient costs of delivering the CM project in our project assessment.

**Our assessment of the CM project**

***Our approach***

We've looked at the efficient costs of the CM project, including the proposed risk sharing arrangements and the design of the proposed reinforcement. Similar to RIIO-T1, under SWW we assess the efficient costs for a project up front. We also adopt a proportionate approach (in line with the RIIO principles), which involves putting the most effort into scrutinising areas that have a large impact on costs.

We have used several techniques to determine the efficient costs of the CM project. These include some unit cost benchmarking, a detailed review of some costs, cost modelling of some project components, a sense check of costs against comparable projects, and a review of SHE Transmission's procurement strategy and processes.

We appointed DNV GL to assist us in our assessment, and make recommendations for the efficient costs in the areas of the project it looked at. We are publishing DNV GL's report alongside this consultation letter. DNV GL's findings have fed into our assessment and informed our overall view on the proposed efficient costs for the project.

***Our findings***

The CM project has two key parts: an HVDC link and onshore works. The main project costs are for:

- the construction of the HVDC link and onshore developments

[2] The transmission price control, RIIO-T1, started on 1 April 2013 and will run until 31 March 2021.
[3] For more detail on the SWW arrangements see our website: https://www.ofgem.gov.uk/publications-and-updates/guidance-strategic-wider-works-arrangements-electricity-transmission-price-control-riio-t1-0
[4] Our April 2014 consultation on the needs case for the CM project is at: https://www.ofgem.gov.uk/ofgem-publications/87020/openletterconsultationoncaithnessmorayneedscase.pdf
[5] Our July 2014 decision letter on the needs case for the CM project is at: https://www.ofgem.gov.uk/ofgem-publications/88879/cmdraftdecisionletter22july14.pdf



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- SHE Transmission's own resourcing; and
- the project risks that SHE Transmission will manage (ie risks not included in the contracts with its suppliers).

Based on our assessment, the construction costs for the two parts of the CM project are at the higher end of our efficient cost range. In addition, we consider SHE Transmission's proposed costs for its resourcing, and for the project risks it holds are not justified by the evidence presented. In our view the overall project cost of £1,236.2 million proposed by SHE Transmission is not justified. We propose the efficient cost is £1,062.3 million.[6] This is £173.9 million lower than SHE Transmission's estimate. An annual profile of the project totals above is in Annex 1 to this letter.

*Managing cost uncertainty*

There is uncertainty around the efficient cost of delivering a large project like the CM project. Even with efficient mitigation strategies, the cost will depend on which risks turn into problems, and whether unexpected difficulties arise. Recognising the problems experienced on large capital projects, there are two mechanisms which apply generally to all SWW projects, including the CM project. The first is the sharing factor in the RIIO-T1 price control. If SHE Transmission spends more or less than its allowed expenditure, the sharing factor will allocate the difference between the company and consumers. The sharing factor provides a strong incentive for SHE Transmission to manage costs efficiently.

The second mechanism is the SWW reopener which safeguards SHE Transmission from some unlikely but high impact events on SWW projects. The company can request us to review the efficient costs if, as a result of a specific event, actual expenditure is 10% above or below the project allowance.[7]

SHE Transmission has suggested that alternative arrangements may be more appropriate for the CM project, such as consumers getting a larger share of any underspend or overspend, reducing the SWW reopener threshold, or making additional allowances conditional on contingent events occurring. We are interested in your views on the arrangements for managing uncertainty for the CM project.

***Proposed cost reductions and our assessment***

Our proposed reductions to SHE Transmission's project costs are summarised below.[8] These are shown as the percentage reduction for each category, and for the total project.

| Cost category | Cost reduction |
|---|---|
| Onshore construction | -6.4% |
| HVDC construction - contract and other costs | -1.4% |
| Resources | -38.1% |
| Risk | -60.9% |
| Operations and Regulatory and Consent | 0.0% |
| **Total project costs** | **-14.1%** |

[6] Our view on the efficient cost of the project is £46.9 million more than DNV GL's overall £1,015.4 million cost recommendation. There are two reasons for the difference. First, we haven't included a potential cost reduction for the cable route DNV GL identified in its report. Second, we have included a cost reduction for some HVDC link construction costs and risks which were outside the scope of DNV GL's assessment.

[7] The SWW reopener applies for the following: extreme weather; imposition of additional terms or conditions for any statutory consent, approval or permission; movement of agreed outages by the System Operator; or changes in project scope that could not have been reasonably anticipated during the assessment process.

[8] Owing to potential commercial sensitivity of the underlying cost information in SHE Transmission's project submission we can only provide high level breakdown of our proposed cost reductions. We believe this is necessary to protect the interests of consumers in ongoing and future procurement exercises.



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Below we summarise the assessment carried out for each category of costs. Categories for resources, risks, operations, and regulatory and consents cover costs for both the HVDC link and the onshore works.

*Onshore works construction*

The onshore works of the project consist of the design, procurement and construction of five new substations, redevelopment of two substations, two new 132kV and 275kV overhead lines and the re-conductoring of an existing 275kV overhead line circuit.

Our consultants undertook a bottom up review of the costs of the Blackhillock substation, the highest value part of the onshore works. Our consultants also compared the costs of the other substations and the overhead line works to different cost benchmarks of equipment and civil works. This analysis identified significant differences between the costs of three substations and the benchmark costs. Whilst information provided by SHE Transmission on future proofing, anticipatory investment to connect new generation, and some site specific works explained most of the gap, it did not justify all the difference. During consultation we will check the proposed anticipatory investment is not in scope of the generation connection volume driver SHE Transmission has under its price control, ie no potential for double funding.

We propose efficient costs for the onshore construction works are 6.4% lower than SHE Transmission's proposed costs.

*HVDC link construction – contract and other items*

The HVDC link consists of 110km subsea cable, 29km underground cable, and two converter stations. SHE Transmission has an engineering, procurement, construction (EPC) contract for this part of the project.[9] SHE Transmission's proposed costs in this category also covers some other items not included in the contract. These relate to:

- changes in the works identified after the contractor proposed its work activities
- differences in opinion between SHE Transmission and its primary contractor on the interpretation of the scope of works, eg requirements for spare subsea cable sections, and
- construction costs that are relatively minor, such as environmental insurance and land agent fees.

We think the proposed contract cost for the HVDC link is at the higher end of the efficient cost range. Our view is based on cost modelling of the subsea cable and from comparing the entire HVDC link cost (ie all cable and converter stations) to other similar projects. We have assumed in comparing contract prices that the level of project management and risk placed with contractors is efficient (with the implication that the higher costs compared to the benchmark reflects a higher level of risk passed to the contractors).

We also assessed the other items in this category based on the level of detail provided in SHE Transmission's submission. We found the proposed costs of some items are efficient, eg metal price index changes, and requirement for onshore cable spares. However, we have proposed reductions to the costs of some items that did not appear to be at the efficient level based on the supplier activity schedule, eg additional requirements for horizontal directional drilling along the cable route.

After accounting for these higher costs, we propose a 1.4% reduction to SHE Transmission's proposed construction costs for the HVDC link.

[9] SHE Transmission's contracting strategy is an Engineering, Procurement, Construction (EPC) contract type for the HVDC link and a mixed approach for the onshore works. Under an EPC contract, the primary contractor is responsible for designing, procuring and delivering the project to completion.



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*SHE Transmission's resources*

SHE Transmission has proposed additional staff requirements for project management, engineering and commissioning on all parts of the CM project.

Our consultants carried out a line by line review of the resourcing role profiles. This analysis suggested there is excessive monitoring of contractors, some duplication of roles, over allocation of staff, and high average day rates.

On the basis of this review, we propose the efficient resourcing costs are 38.1% lower than the level proposed by SHE Transmission. We have sense-checked our resourcing cost by a top down comparison to projects with high capital cost items. For example, our proposed project management costs (measured as a percentage of total project costs) are broadly consistent with figures from the Western HVDC link between Scotland and north Wales, and an interconnector project we are currently assessing.[10]

*SHE Transmission's risk allowance*

SHE Transmission has proposed an allowance for the risks it would be managing on the CM project overall.

Our consultants conducted a detailed analysis of the highest value risks (28% of risks by value). This found a number of issues including:

- a tendency to overestimate the probability of risks
- little justification or evidence informing the estimated impacts of risks
- no consideration of positive or negative correlation between the risks
- the inclusion of some risks that had time expired, and
- a lack of clarity on the impact that mitigation measures have had on risk probability or potential cost impact.

This scrutiny resulted in a percentage reduction in the costs of project risks. Our consultants then extrapolated the findings to the remaining risks.

We think it is important to consider the proposed risk allowance in the context of the company's overall approach to procurement and delivery. For the CM project, SHE Transmission has generally adopted an EPC procurement strategy. The benefit of this approach from a developer's point of view is that much of the delivery risk is placed with the contractor and included in the agreed contract value. This means, the risk allowance for SHE Transmission is for the residual risks not included in contracts with its contractors.

Given our view that the contract values for the CM project are coming in at the higher end of our range of efficient costs, we think the costs for the residual risks SHE Transmission is managing look very high and are not justified on the evidence presented. We also think there shouldn't be high risks associated with the substation works as these are well within SHE Transmission's expertise area.

In light of our consultants' review and the above factors we propose a 60.9% reduction to the risk allowance for the CM project.

Since this analysis was completed, SHE Transmission has provided two updated versions of the project's risk and the potential impacts (risk register). We have not been able to assess the updated information but note that the total allowance SHE Transmission is proposing is slightly lower than its earlier submitted register. During consultation we will update the risk allowance for the latest risk register before considering other information we receive in the consultation.

[10] Due to the commercial nature of the comparators, we are not able to publish individual figures for the projects.



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*Operations, and regulatory and consents*

We are not proposing any reduction in this area.

*Route of the HVDC cable*

Our consultants also challenged SHE Transmission on whether the proposed HVDC cable route is optimal compared to two alternative routes. These would involve a shorter cable and potentially lower capital costs.

SHE Transmission said it looked at one of the alternatives but had discounted it. This is because it went through a seabed exclusivity zone held by an offshore wind farm and wouldn't be compatible with the developer's plans, as it would probably require the developer to sacrifice some wind turbines in the vicinity of the cable. Although no negotiations were entered into, SHE Transmission said the amount of compensation it would have to pay the developer to secure this route would likely offset any capital cost saving.

SHE Transmission also saw little merit in the second route located to the south-west of the offshore wind farm, potentially avoiding the exclusivity area. Although it hasn't explored this route in detail it argues that the capital saving might be very limited, or possibly non-existent. This is because the alternative route could face significant planning difficulties as there are several environmental constraints and sensitivities along the route corridor. As a result, the cost differential might be less than expected, due to costs of addressing these concerns, or in the worst case, the route might not get consented because of objections.

SHE Transmission also highlighted that its proposed route provides wider benefits for optimising the system development for future transmission connections (including Shetland). A shorter route (and capital cost saving) on the CM HVDC link would be offset by a longer transmission link to the mainland in future (potentially more than one).

We are not proposing any reduction based on the alternative cable routes. We recognise that had SHE Transmission reapplied to consent a new route that would have likely delayed the project by at least three years. This could lead to an overall reduction in net benefits to consumers from the CM project. We also acknowledge the capital saving on the CM HVDC link would be offset by higher costs on a future connection from the Shetland islands.

**Proposal to allow recovery of project costs in 2015/16 revenues**

Every year, National Grid calculates the annual charges to recover the costs of the transmission companies. These are usually finalised at the end of January before the start of the financial year in April. A key input to this calculation is a final forecast of allowed revenue provided by the transmission companies in January.

In November we are due to update SHE Transmission's allowed revenue for 2015/16. If we update this in November this year it will not include any additional expenditure for the CM project as we will not have made a final decision at that time. This would mean the 2015/16 charges National Grid calculates would not reflect the additional expenditure SHE Transmission will incur on the CM project.

SHE Transmission requested we address this timing issue by updating its 2015/16 revenue in January 2015 instead of November 2014. That way the update will happen after our final decision on the allowed expenditure for the CM project, and SHE Transmission can give National Grid an accurate revenue forecast that takes into account the CM project.

In our July decision letter we said that we'd consider this issue. We think that updating SHE Transmission's 2015/16 revenue in January 2015 is the right thing to do in the case of the CM project (reflecting the large scale of the project and the impact on revenues). This will ensure that the company's cash flows reflect the expenditure it is incurring on the project



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during 2015/16. It will also avoid introducing unnecessary volatility in transmission charges.[11]

**Next steps**

We intend to make a final decision on SWW output and allowed expenditure at the end of this year, after considering responses to this consultation. To implement our decision we will undertake a statutory consultation to modify SHE Transmission's electricity transmission licence. The licence change would specify a new SWW output and allowed expenditure for the CM project, and a date by which it is to be completed.

We listed our main consultation questions at the start of this letter. Please send your responses to SWW@ofgem.gov.uk by 24 November 2014. If you have questions about this letter or the consultation you can contact Anna Kulhavy, telephone 020 7901 7390 or Rupert Crilly, telephone 020 7901 1809.

Unless marked confidential, we will publish all responses on our website (www.ofgem.gov.uk). If you wish your response to remain confidential please clearly mark your response to that effect and give your reasons for seeking confidentiality.[12]

Yours sincerely,

Kersti Berge
**Partner, Electricity Transmission**

[11] If we did not update SHE Transmission's price control revenues in January 2015 it would face a revenue shortfall in 2015/16 of £65 million (2009/10 prices) – 23% of its annual revenue. The amount would then be made up in revenues for 2016/17, causing some volatility in transmission charges.
[12] Ofgem shall respect such requests subject to any obligations to disclose information, for example, under the Freedom of Information Act 2000 or the Environmental Information Regulations 2004.



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## Annex 1 – Proposed annual expenditure for the Caithness Moray project

| 2013/14 prices | 2013/14 | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | Total |
|---|---|---|---|---|---|---|---|---|---|
| | £m | £m | £m | £m | £m | £m | £m | £m | £m |
| Costs proposed by SHE Transmission | £9.380 | £151.972 | £382.336 | £397.063 | £200.292 | £75.917 | £9.691 | £9.575 | £1,236.226 |
| | | | | | | | | | |
| Total reductions | -£1.052 | -£20.244 | -£53.443 | -£56.102 | -£30.222 | -£10.179 | -£1.347 | -£1.335 | -£173.923 |
| | | | | | | | | | |
| Efficient costs proposed by Ofgem | £8.328 | £131.728 | £328.893 | £340.961 | £170.070 | £65.738 | £8.344 | £8.240 | £1,062.303 |