

***nopylons.co.uk* Response to OFGEM Consultation**

North West Coast Connections- Consultation on the project's Initial Needs Case and suitability for tendering.

Summary. We welcome OFGEM's proposals to require separable sections of the Northwest Connection to be put out to competition and put forward our rationale for competing:

- **offshore Bootle to Walney and**
- **the Duddon Tunnel**

1 Introduction.

1.1 Our team of experienced engineers and concerned local residents was established when NGET released details of their Preferred Route Connection which selected an onshore connection from Moorside to Barrow in Furness taking 400kv pylons through the unobstructed Duddon Valley.

1.2 OFGEM states that "The project's impact on the LDNP **and its setting** will be a key consideration within any final planning consent for the project."

2 nopylons Preferred Route

2.1 Our route leaves the PRC North of Bootle and goes offshore at Selker Bay. The beachhead at Selker Bay was investigated by NGET for the Route Corridor Studies.

2.3 The HVAC route is 35km overall. NGET has established there are no cable crossings.

2.4 NGET's route from Roose to Walney then Rossall was trenched under Walney channel and Walney Island to the beach at Walney South. We use this route from Walney to Roose.

2.6 This route protects the Whicham Valley, superlative Duddon Valley and Furness from desecration by Giant Pylons.

3 Savings within the PRC will be used towards funding the Offshore Route Bootle to Roose.

3.1 Not erecting giant pylons Silecroft to Roose saving £82m

3.2 To make way for the 400kv pylons over the existing route the 132kv pylons are to be removed. Trident pylons would be erected for 7 years to supply existing consumers. The 132kv pylons can be left in place saving £120m.

3.3 Trenching is not required between Bootle and Silecroft saving £193m

3.4 The total savings available are therefore £395m

3 Offshore Costings.

NGET has selected 12 underground/ tunnel cables with a conductor cross section of 2500sqmm. Their offshore calculations are based on cables of 1200sqmm conductor which to achieve the required capacity increases the number of cables to 18.

Offshore submarine 400kv, HVAC cables are widely available at 1200sqmm conductor. 400kv HVAC 2500 sqmm cables are being introduced and are very likely to be available by 2023 when the South Connection build commences. Reducing the cable swathe from 1.3km for 18 cables to a swathe for 12 cables will result in a reduced swathe width of 0.84km. A twelve cable swathe would reduce the installation costs from those calculated below.

Due to the lack of transparency of the components of the NGET estimates, it is difficult for a third party to make an accurate assessment. For example, NGET have an allowance of £328m for "infrastructure." We do not know what elements are in this budget. Examples of possible infrastructure costs could be substations, transformers, temporary roads to access difficult stretches of the route, down to say costs of cable end sealing compounds at £600k each etc.

4.1 There are two sources of publicly available offshore costs.

4.2 NGET published data in an Appendix E Technology to the Electricity Ten Year statement, 2015. Table E23.23 shows 400kv HVAC cable costs/ km.

Table E23.23 shows that 3x Single Core cables with copper conductor rated at 1000MW costs £1m/ km. (400kv cables with an aluminium conductor are much cheaper at £0.6m/ km). Nine cables (core 1200sqmm) would be required for 1 circuit, £3m/km in copper. For 2 circuits 18 cables would be required at a cost of £6m/km. For a route length of 35km the cable cost would be **£210m**.

4.3 The IET commissioned Parsons Brinckerhoff to produce an independent report entitled "Electricity Transmission Costing" Study published in 2012.

Although this report did not cover HVAC, it did cover in detail HVDC installation costs.

Pages 108, 109 details the build up costs off offshore as follows:

Fixed Build Studies £0.2m, Cable Landing £36.5m, Mobilisation £3.4m, Project Management £12.7m, Cable Studies £38m, Weather allowance £24.2m, Insurance £8.9m, Management £31.9m, Contingency £47.9m, total £204m. This is for a route length of 75km, Bootle - Walney at 35km reduces this figure by 13.4%, hence cost is £177m.

Installation costs are £92.5m giving total cost of **£269m**

4.4 Adding cable costs of £210m to the project costs of £269m gives a total of £479m.

Identified savings are £395m. The conclusion is that the Bootle Walney route represents an additional cost over the PRC of **£84m**.

4.5 Although not applicable to the NWCC in June 2015 OFGEM published “Offshore Cost Assessment Development Update”. This report shows that the costs of 132kv cable supply and installation are both approximately £1m per km

5 Duddon Tunnel

1 This option was summarily rejected by NGET on the grounds that it would add £231m to the PRC. National Grid Volume 2.8 Optioneering report states *“the tunnel would be of similar construction and depth to that of the Morecambe Bay tunnel ie 5.5m internal width.”*

5.2 Duddon Tunnel Diameter.

It’s difficult to visualise a 5.5m tunnel but by way of a size comparison, many of the London Transport’s tube tunnels are 3.5m diameter!

NGET’s Document on undergrounding
undergrounding_high_voltage_electricity_transmission_lines_The_technical_issues_INT (2) states

A tunnel with a diameter of around 4m would be required to provide sufficient room for up to 12 cable cores and joint bays. Within the tunnel a rail mounted access vehicle may be required to provide safe emergency exit and allow inspection, maintenance and repair. Cable cooling is provided by forced air cooling from electrically driven fans.

Boring a 5.5m diameter tunnel costs 89% more than a 4m diameter tunnel.

OFGEM have reservations regarding the choice of diameter for the 22km Morecambe Bay Tunnel diameter “the final diameter of the tunnel could eventually be reduced.” The final diameter of this tunnel may be determined by Health and Safety concerns in a tunnel of 22km length and with an Island and no intermediate escape shafts.

Existing NGET tunnels.

NGET’s London Power Tunnel, presently under construction, has sections of both 3m and 4m diameter. The completed NGET 400kv Elstree and Beddington Tunnels are both 3m diameter.

5.3 Tunnel Head Location Options by NGET

The western end of the Duddon Tunnel would be located adjacent to an industrial estate in Millom as selected by NGET.

National Grid’s option to site the eastern tunnel head in Duddon Estuary adjacent to Marsh Grange Farm (a listed building) is an unacceptable blot on the Duddon Estuary. NGET did not illustrate the size of the required Cable Sealing End compound which would extend to a width of 72 metres. The 400kv Terminal Tower would have a base of 14.5x x 14m and have considerable extra bulk compared with the standard 50m lattice pylon which has a base of 7m x 7m. The narrow lane to this site is accessed onto the A595 on a blind bend. In addition

there would be the head house buildings to provide access for maintenance and for installation of the cables at each end. Head house buildings are around 16m x 16m x 7m. NGET's chosen tunnel head would be 750m from the estuary shoreline in the stunning Duddon Valley these eyesores are unacceptable.

nopylons Tunnel Head Siting above Askam in Furness.

The eastern end of the re-routed Duddon tunnel should be located to a site to the north of Askam Brick works and Greenscoe Quarry. This location avoids destroying setting of the Lake District National Park, is away from residential properties and not prone to flooding. Access is readily available from a straight section of the A595 road.

Duddon Tunnel Costs to connect to the PRC.

6.1 Total Tunnel Cost from IET / Parsons Brinckerhoff Pages 64, 65 for 4m diameter tunnel. Lifetime cost for 3km length is £128m. For route length 4.5km add 36.3% gives £175m.

6.2 Cost of connecting to the PRC.

Millom, Adjacent to Devonshire Rd Industrial Estate to Silecroft, 6km OHL £24.6m.

Askam East to Far Old park Farm on the PRC, 1.5km, £6.15m

Total for linking into the PRC pylons, £31m.

6.3 Overall cost £175m + £31m = £206m

6.4 Potential savings Duddon Tunnel.

No 400kv OHL Millom to Askam, 17km, £69m

No 132kv removal Millom to Askam, £27m

No Trident line Millom to Askam 20km at 0.18m/km £3.6m

Total savings, £100m.

6.5 Net Cost of Duddon Tunnel over PRC cost is £106m.

OFGEM Questions

Question 1: Do you agree that there is a technical need for the project if Nugen's project goes ahead?

Answer. The Nugen build programme may be delayed whilst funding is sought to follow on from the design phase. This is not a short term programme issue during the Moorside design and site preparation phase. NGET should be advised to seek a DCO for the northern corridor.

Question 2: Do you agree connecting Moorside site using four 400kv circuits is appropriate and compliant with SQSS requirements?

Answer. Yes

Question 3: Do you agree with our initial conclusions?

Answer. We agree that the Morecambe Bay Tunnel is the best route for the connection south from Roose to Heysham. The design of the Morecambe Bay tunnel should be progressed in the short term.

We agree with OFGEM's concerns that the offshore cost data estimate is too high. However the only cost data National Grid published for their consultation was Table 6.3 Volume 2.8 Section 2.8.9 which showed that all offshore connections across Morecambe Bay resulted in a PRC of £3,000m.

We do not agree that a DCO for the south connection needs to take place in 2017.

Question 4: Are there any additional factors that we should consider as part of our Initial Needs Case assessment.

Answer. Yes. OFGEM have accepted the PRC which is based solely on the options selected by National Grid.

Our contention is that an offshore route Bootle to Walney is affordable and should be fully investigated.

Offshore Bootle to Walney represents an additional cost to the PRC of £84m.

The Duddon Tunnel, Millom to Askam should be re-worked with the correct 4m diameter which results in a net increase over the PRC of £106m.

Question 5: Do you agree with our view that

(a) The overall project meets the criteria for tendering?

Answer. On published timescales it may be too late to tender the North Connection

(b) The potential sections meet the requirements for tendering?

Answer. There is plenty of time to tender:

Offshore Bootle to Walney

The Duddon Tunnel as detailed above.

Both of these options meet the "separability" criterion.

Question 6: What are your views on our overall delivery assessment for

(a) The overall project?

(b) The potential sections?

In particular, considering our analysis of the design, procurement, construction timelines submitted by NGET.

Answer. Broadly agree with OFGEM's overall assessment but with the proviso that our answers to the above questions are taken in account.

Question 7: What are your views on the need for overall coordination of the NWCC project if the project were to be split into packages with different delivery parties?

Answer. It is essential to have an overall coordinating authority which should be NGET. The alternative of an overall Prime Contractor is probably inadvisable.

Question 8: If some, or all of NWCC were to be tendered, what, in your view, is the most appropriate allocation of risks across the relevant parties (TO, CATO's and consumers)? How should these risks best be managed?

Answer. The work put out to competition must have:

A requirement specification with numerate performance requirements which can be proven in acceptance testing.

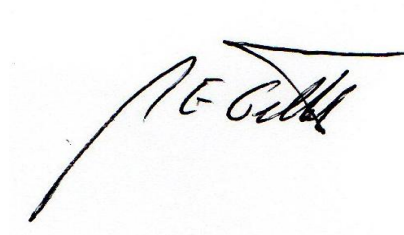
A programme with clear measurable milestones which is supported by a risk register monitored and reported monthly.

Question 9: What are your thoughts on the substation modifications and extension works at Harker and Middleton, in the context of efficient CATO delivery, including the options presented in this document.

Answer. No comment.

We appreciate the opportunity to respond to this consultation and wish to be kept informed as appropriate. We are happy to discuss our views further if you consider this necessary.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'PE Gillett', with a large, sweeping flourish extending from the start of the signature.

PE Gillett, B.Eng., MA, Dip. Marine Tech

On behalf of the *nopylons* Team, www.nopylons.co.uk Dated 24 February 2017

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cc Mr Robert Powell, Project Manager NWCC