MINUTES OF THE MEETING OF

THE NETWORK OPTION ASSESSMENT COMMITTEE (the "NOA Committee" or the "Committee")

Held in

National Grid House, Warwick Technology Park, Warwick CV34 6DA On Monday 24 September 2018 at 09:30

Present: Duncan Burt (Chair)
Mike Breslin
Richard Smith
Julian Leslie
Marcus Stewart

In attendance: Jingchao Deng – Technical Secretary
Audrey Ramsay – Future Operability and Incentives Manager*
James Greenhalgh – Electricity Customer Connections Manager
Hannah Kirk-Wilson – Technical Economic Assessment Manager
Iain Shepherd – Acting Economic Assessment manager
Kelvin Lambert – NOA Lead – for minutes 1 to 2
Jason Hicks – NOA CBA Lead
Mark Pearce – NOA CBA Technical Specialist
Richard Proctor – ETYS Lead
Kevin Tse – Pathfinding Project Lead – for minutes 2 and 4
Hui Jiang – Eastern SWW CBA Lead – for minutes 5.3
Paul Neilson – Technical Policy Manager, SHET – for minutes 3 to 5
Malcolm Barnacle – for minutes 3 to 5
David Adam – Lead Design Engineer, SPT – for minutes 4 to 5*
Kirsten McIver – Senior Design Engineer, SPT – for minutes 4 to 5
Mark Perry – System Design Manager, NGET TO – for minutes 4 to 6
Le Fu – NOA Lead, NGET TO – for minutes 4 to 6
Kathleen Baines – NOA Lead, NGET TO – for minutes 4 to 6
Clothilde Cantegreil – Head of RIIO Electricity Transmission, Ofgem
Zak Rich – Senior Manager of Systems and Network, Ofgem

*Joined by teleconference

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1.1	**Welcome and apologies for absence**
	[This section is redacted due to its administrative nature]
1.2	**Meeting governance and process**
1.2.1	**Terms of reference**
	[This section is redacted due to its administrative nature]
1.2.2	**Interests**
	[This section is redacted due to its administrative nature]

1.2.3	**Proxies**
	[This section is redacted due to its administrative nature]
1.2.4	**Confidentially**
	[This section is redacted due to its administrative nature]
1.2.5	**Risks**
	[This section is redacted due to its administrative nature]
1.3	**Minutes of the NOA Committee meeting of 27 April 2018**
	[This section is redacted due to its administrative nature]
1.4	**Actions arising from the NOA Committee meeting on 27 April 2018**
	[This section is redacted due to its administrative nature]
2	**Overall update on Pathfinding projects**
	The following document, presented by Mr. Tse and distributed prior to the meeting, was taken as read: • Pathfinding projects update Mr. Burt invited Mr. Tse to provide an update on the progress of the Pathfinding projects. The following points were noted: • Thermal probabilistic analysis o A tool has been developed to facilitate the year-round boundary capability analysis. o Sample studies are to be carried out for testing the probabilistic approach further. o The year-round analysis is planned to be included in next year's ETYS/NOA studies o A set back to the current progress is that the lead subject matter expert has recently left the company. • High voltage o Work has commenced for Pennine, Mersey Ring, and South Wales regions. o For the Pennine region, the needs of 4x200Mvar reactive support are justified through the technical and economic analysis. Both transmission and distribution options are being considered for finding the most economical solutions. The project is on track and set to complete in Q3 of 2018/19. The results will be reported in the December NOA Committee meeting. o For Mersey Ring and South Wales regions, system needs studies have been concluded, and the findings were shared with DNOs in these regions to develop potential options. In addition to asset-based TO/DNO options, commercial options will also be considered in conjunction with the Commercial teams. [Redacted due to its commercially sensitive nature] The project is currently on track. o The DNOs have concerns around the funding mechanism for the development of their options. This is considered a risk for a timely delivery of the high voltage pathfinding projects. Mr. Burt asked Mrs. Kirk-Wilson to pursue the DNOs' concerns and work with Ofgem for developing the funding mechanism/framework for long-term.

	• **Action 9.2** – Work with Ofgem to develop the funding process to support DNO options for addressing transmission system needs. Mr. Rich said DNO options may also provide benefits such as dynamic support to the distribution network and asked whether these benefits are captured by the pathfinding projects. Mr. Tse responded that these additional benefits to the distribution networks are not reflected in the studies. • Voltage identification tool o A voltage identification tool has been developed for initial screening and prioritising regional voltage issues across the country to facilitate the detailed system needs studies. It will be used in next year's NOA.
3	**Update on SWW projects for SHE Transmission only**
	Mr. Burt invited Mr. Hicks and Mr. Neilson to provide an update on the progress of the Scottish Islands Strategic Wider Works (SWW). The following points were noted: • Three Scottish Islands SWW projects are undertaken by SHE Transmission including Orkney Link, Western Isles Link and Shetland Link. • The ESO has supported the Needs Case submissions of Orkney Link and Western Isles Link in March and August 2018 with a conditional recommendation subject to certain generation capacity thresholds are met in the upcoming Contract for Difference (CfD) auctions. • The cost-benefit analysis (CBA) of the Shetland Link is ongoing. A conditional recommendation similar to that of the other two links is expected. • [Redacted due to its commercially sensitive nature] Mr. Burt asked whether the generation capacity thresholds for triggering the SWW projects will be published. Mr. Neilson said they will consider publishing the thresholds.
4	**Update on Pathfinding projects to TOs**
	Mr. Burt invited Mr. Tse to provide an update on the progress of the Pathfinding projects to the TOs. Mr. Tse highlighted the progress of the ongoing Pathfinding projects including the development of the thermal probabilistic analysis tool, high voltage studies and the development of the voltage identification tool. He noted the meeting that the ESO had engaged the TOs on Pathfinding projects in separate meetings and had received some useful feedback.
5	**Scotland and the North of England**
5.1	**Regional updates**
5.1.1	**Commentary on the network and boundaries including the effect of the Future Energy Scenarios**
	The following document, presented by Dr. Proctor and distributed prior to the meeting, was taken as read: • Regional commentary on network and boundaries

	Mr. Burt invited Dr. Proctor to provide an update on the findings in Scotland and the North of England. The following points were noted: • Increasing north to south flows are driven by renewable generations in the north part of the country. This is found consistent with the findings in the last couple of years. • There is a significant growth in boundary capability needs across the next twenty years for some northern boundaries such as B6 (Anglo-Scottish) and B4 (SHE Transmission to SPT). • Interconnector flows are taken into account for the identification of system needs. Separate sensitivity studies are conducted for import, export and float conditions on the [Redacted due to its commercially sensitive nature] interconnectors. Mr. Burt commented the interconnector sensitivities and modelling of European Scenarios are crucial to ensure the background used by NOA is credible.
5.1.2	**Description of options including reduced-build options and commercial options**
	The following document, presented by Dr. Proctor and distributed prior to the meeting, was taken as read: • Options Dr. Proctor summarised the options that were recommended to proceed in NOA 2017/18 for Scotland and the North of England region and highlighted the key changes for this year. The following points were noted: • Two additional landing points in the North of England are considered for Eastern HVDC Links. • Power flow control device options are considered between Harker and Stella West. • A circuit intertrip is considered between Harker and Stella West. • A number of new asset-based options are considered.
5.2	**Commercial solutions methodology**
	The following document, presented by Dr. Pearce and Mrs. Kirk-Wilson and distributed prior to the meeting, was taken as read: • Commercial solutions in NOA 2018/19 Mr. Burt invited Dr. Pearce and Mrs. Kirk-Wilson to provide an update on commercial solutions. The following points were noted: • Generic commercial options will be included in the NOA 2018/19 economic analysis. • Commercial options will be modelled as increments on boundary capabilities. • Relevant power system studies will be conducted in parallel with the CBA and results will be used at the end of the CBA process. • The costs of those options will be developed with the Commercial teams based on existing or past commercial arrangements such as contracts on intertripping schemes. • The next step is to work with the Commercial teams to develop a plan for

	the inclusion of market-tested commercial solutions in the NOA 2019/20. The intention is that these options will be available to be included in the power system studies commence in June 2019 to facilitate a full assessment against asset-based options. Mr. Rich asked what is the ESO's vision on commercial solutions in the next 4 to 5 years. Mr. Burt responded that, as the next steps, the ESO will test the market and is aiming to include a number of commercial solutions which are comparable to asset-based options in the coming years; then seek the expansion of including commercial solutions from distribution networks.
5.3	**East Coast SWW**
	The following document, presented by Mrs. Jiang and distributed prior to the meeting, was taken as read: • East Coast SWW Mr. Burt invited Mrs. Jiang to provide an update on East Coast SWW. The following points were noted: • The SWW studies include the East Coast onshore works, Eastern HVDC Links from Peterhead to the North of England and Eastern Links from Torness to the North of England. • Two additional landing points (Drax and Cottam) are proposed for the Eastern HVDC Links, totalling four new options. • The SWW CBA covers a total number of 10 reinforcement options in 58 combinations and uses Future Energy Scenarios (FES) 2017. • The CBA is due to be completed by the end of September 2018 and the Needs Case is to be submitted in December 2018. Mr. Nelson updated that the Needs Case will be submitted in Q1 2019 instead. Mr. Perry noted that the SWW results may contradict with the NOA 2018/19 recommendations. Mr. Neilson commented that the differences between the SWW and NOA should be recognised and the Needs Case submission should be reconciled with the findings from the latest NOA.
5.4	**Updates from the TOs**
	Mr. Burt invited the TOs to provide an update on the following actions from the previous NOA Committee meetings: • **Action 1.5** – The Committee would like to see multiple spend profiles for the projects this year [Redacted due to its commercially sensitive nature] • • **Action 4.6** – Request to all TOs for multiple spend profiles for large reinforcements for submission into the NOA. The following points were noted: • SHE Transmission/SPT had reviewed East Coast onshore 275kV upgrade (ECU2) and East Coast onshore 400kV incremental reinforcement (ECUP) and concluded that the EISDs for the two options are credible and there is hardly any scope to accelerate the delivery. • [Redacted due to its commercially sensitive nature]

	• NGET TO had concluded in its latest Network Development policy (NDP) publication that 17 out of 18 'Proceed' options recommended by the NOA 2017/18 will proceed this investment year. The only option on hold is Mersey Ring Uprate 275kV to 400kV (MRUP) which was considered marginal in the NOA 2017/18. However, it was confirmed that the EISD of this option can be maintained without the option being proceeded. Mr. Burt noted that there are no regulatory incentives to support the TOs to accelerate the delivery of reinforcement options; therefore, the current EISDs submitted by the TOs should be considered **credible** for the NOA 2018/19. Mr. Burt advocated flagging up the options that could bring greater benefits to consumers when delivered earlier than their current EISDs, and keep working with Ofgem towards RIIO-T2 on regulatory incentives to support TOs' developments. • **Action 9.3** – Mr. Neilson to submit written evidence to capture TOs' concerns on accelerating options to facilitate the regulatory incentives discussions with Ofgem. (Due date: 08/10/2018)
6	**The England and Wales region exc North**
6.1	**Regional updates**
6.1.1	**Commentary on the network and boundaries including the effect of the Future Energy Scenarios**
	The following document, presented by Dr. Proctor and distributed prior to the meeting, was taken as read: • Regional commentary on network and boundaries Mr. Burt invited Dr. Proctor to provide an update on the findings in the England and Wales region (excluding the region already covered in item 5). The following points were noted: • Large variance of network reinforcements is identified for the East Anglia region (boundary EC5) under different scenarios. [Redacted due to its commercially sensitive nature] • The boundary capability needs for the South Coast are volatile across the next 20 years with a high dependency on interconnector flows. The boundary is exporting more than importing in later years due to high North to South flows across the country. • The boundary capability needs for the South Wales region are consistent under different scenarios. The SQSS required transfers are much higher than the unconstrained projections due to a higher percentage of peak generation in this region.
6.1.2	**Description of options including reduced-build options and commercial options**
	The following document, presented by Dr. Proctor and distributed prior to the meeting, was taken as read: • Options Dr. Proctor summarised the options that were recommended to proceed in the

	England and Wales region (excluding the region already covered in item 5) and highlighted the key changes for this year. The following points were noted: • More reinforcement options were submitted for the East Anglia region to address the increasing needs. Commercial solutions will be considered for East Anglia in the NOA CBA. • Only one new 400kV transmission route between London and the South Coast was submitted this year; whereas two had been assessed in the last NOA with one been recommended to proceed to SWW. Mr. Leslie said that the ESO will work with NGET TO to develop smart zone controls as an alternative to the new route for the South Coast.
6.2	**Updates from the TO**
	NGET TO had submitted their updates in writing prior to the meeting. The presentation slides were taken as read. Mr. Perry and Mrs. Baines provided an update on the new 400kV route options between London and the South Coast. The following points were noted: • NGET TO had reviewed the new 400kV route options between London and the South Coast. The options had been narrowed down to a single route. • [Redacted due to its commercially sensitive nature] • The revised option [Redacted due to its commercially sensitive nature] meet the eligibility criteria for competition of onshore electricity transmission. The competition process was NOT factored into the EISD of the option. Dr. Proctor commented that there are not enough options for the South Export sensitivities. Mr. Burt pointed out that NGET TO's commentaries regarding Lister Driver Quad Booster (LDQB) might be a false interpretation of the recommendation. He reiterated that a 'marginal' recommendation for LDQB means that the needs for the option are finely balanced, not that the option should be excluded for consideration. • **Action 9.4** – NGET TO to improve the process for capturing the correct interpretations of the NOA recommendations to make sure the delivery of options is achievable and consistent in the future.
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7.1	**Date of next meeting**
	11th December 2018
7.2	**Any other business**
	None
7.3	**Feedback and review**
	[This section is redacted due to its administrative nature]

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Chairman

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Date