Meeting minutes

NOA Committee - June 2022

Date:	17/06/2022	**Location:**	MS Teams
Start:	09:30	**End:**	12:30

Participants

Attendee	Role in meeting	Job role	Minutes attended
Matthew Wright	Chair	Head of ESO Strategy and Regulation - ESO	1-13
Gavin Brown	Committee member	Proxy for Head of National Control - ESO	1-13
Amy Weltevreden	Committee member	Market Requirements Senior Manager - ESO	1-13
Julian Leslie	Committee member	Head of Networks - ESO	1-13
Lauren Stuchfield	Committee member	Electricity Analysis Senior Manager - ESO	1-13
Paul Wakeley	Support member	Strategic Network Development Manager - ESO	1-13
Susana Nevesebrooks	Support member	Electricity Customer Connections Manager - ESO	1-13
Martin Price	Technical secretary	Power System Engineer - ESO	1-13
Griffin John	Observer	Technical Economic Assessment Manager - ESO	1-13
Jason Hicks	Observer	Holistic Network Design Integration Manager - ESO	1-13
Thomas Petty	Presenter	Power System Engineer - ESO	1-13
Thomas Manicom	Presenter	Power System Engineer - ESO	1-13
Emmanouil Belivanis	Presenter	Power System Engineer - ESO	1-13
Hui Jiang	Presenter	Power System Engineer - ESO	1-13
Victor Matilla	Presenter	Power System Engineer - ESO	1-13
Jeremy Rawlings	Observer	Power System Engineer - ESO	1-13
Zain Ul-Abadin	Observer	Power System Engineer - ESO	1-13
Kelvin Lambert	Observer	Power System Engineer - ESO	1-13
Emilia Thompson	Observer	Power System Engineer - ESO	1-13

External Participants			
Keren Maschler	Observer	Ofgem	1-13
Konark Anand	Observer	Ofgem	1-13
Neil Copeland	Observer	Ofgem	1-13
Niall McDonald	Observer	Ofgem	1-13
David Willmot	Observer	Network Development - National Grid Electricity Transmission	4-9
Owen Wilkes	Observer	Network Development - National Grid Electricity Transmission	4-9
Mark Perry	Observer	Network Development - National Grid Electricity Transmission	4-9
Lisa Cressy	Observer	New Infrastructure - National Grid Electricity Transmission	4-9
Roddy Wilson	Observer	Network Planning Manager - SSEN-T	4-7
Graeme Dean	Observer	Senior Transmission System Planning & Investment Engineer - SSEN-T	4-7
Bless Kuri	Observer	Head of System Planning and Investment - SSEN-T	4-7
Malcolm Barnacle	Observer	Network Planning Manager - SSEN-T	4-7
Kirsten McIver	Observer	Lead Design Engineer - SP Transmission	4-7
Eric Leavy	Observer	Head of Transmission Network - SP Transmission	4-7
David Adam	Observer	Transmission Network Manager - SP Transmission	4-7
Lynne Bryceland	Observer	SP Transmission	4-7

Discussion and details

#	Topics to be discussed
1.	**Apologies and Introduction** Mr Wright welcomed the attendees and introductions were made. Mr Dyke sent his apologies and Mr Brown was appointed as a proxy in his place.
2.	**Governance and process** [Redacted due to administrative nature]
3.	**TOs enter meeting**
4.	**Context setting** Mr Wright invited Mr Hicks to set the context for the HND and NOA refresh reports. The following points were noted. The HND Summary Report will be known as the 'Pathway to 2030 report'. This is only a name change to set the scene. The Strategic Offshore Network Design Report is now titled the 'HND Detailed Report' and covers all offshore and onshore work required to meet 2030 targets.

NOA 2021-22 refresh is a standalone document used to inform the HND. NOA covers the entire period up to 2040.

We have refreshed the terms to make them clearer. In HND,

94 options are 'required' to meet 2030 targets.

- 56 of these are 'HND essential options' are needed to make the network compliant with the design rules by 2030. A lot of these are previous NOA options that have received "proceed" recommendations. 45 essential options have ESIDs of 2030 or earlier; 11 options have EISDs beyond 2030 but will require measures to bring forward the delivery dates.
- 38 'optimal' options have EISDs before 2030.

There are 26 options for delivery after 2030:

- 17 options were found optimal of which 4 received a "proceed" recommendation and 13 were "hold". and
- 9 options were found non-optimal in this NOA analysis

Questions:

Mr Wilkes: What will NOA cover in future? Will NOA continue to provide annual recommendations of "proceed" and "hold"?

Dr Wakeley responded that the need to make strong recommendations to meet net zero and beyond is clear. The detail of how this is delivered is being developed. The Network Planning Review is developing the enduring regime from 2024. We do not have all the answers today, but we are actively working these out with Ofgem.

Mr Wright added that the future process depends partly on how Ofgem wish it to evolve. It has been proposed to Ofgem that some projects required for 2030 will be classed as 'strategic' and will be exempt from competition and re-assessment.

Mr Leslie asked if all 38 'optimal' options have EISDs before 2030.

Mr Hicks confirmed that this is the case.

Mr Copeland asked what had changed to increase the number of schemes requiring acceleration to 2030 to 11 (previously 8)?

Mr Hicks replied that in list of options, some options had not been classified as essential for 2030, these have now been included, thus the Increase In the number of projects.

Mr Leavy: Some projects are referenced in the NOA 2021-22 report but are not in the NOA refresh report. Do these projects have new recommendations from NOA refresh or do the NOA 2021-22 recommendations stand?

Mr Hicks replied that the projects that have EISDs before 2030 maintain the same recommendation as in NOA 2021-22 as the drivers for them have not changed. For each option with an EISD after 2030, it depended on whether the TO submitted it as an option in the NOA refresh. If the option was submitted, it has a recommendation. If it was not submitted, it does not have a recommendation.

Mr Leavy expressed caution with the message that the list shows all the required schemes. This list of schemes represents our best view at the present time but as we understand the requirements from HND2 more schemes are likely to be required.

Mr Wright responded that this plan will continue to evolve as the requirements develop and HND 2 is published. We cannot predict which of these projects will be built but this represents our best understanding at the present time.

Mr Wright asked if the 94 projects required to meet the 2030 target include the offshore options?

Mr Hicks: The options that provide offshore connections and also increase boundary capability are not included in the list of 94 options. The Eastern Links are included in the 'onshore' category because they increase the capability of the onshore network.

Mr Manicom: If both ends of the cable terminate onshore, the cable is regarded as 'onshore' network.

Mr Copeland: There is legal classification of 'onshore' network. For multi-terminal HVDC links, it is not clear if they are onshore or offshore. Ofgem colleagues are collecting data to determine their classification.

5. **Interactive maps demonstration**

Mr Wright invited Mr Matilla to demonstrate the interactive maps for NOA and ETYS.

This project has been in development for more than one year. The maps show the network as shown in ETYS, NOA and HND reports. For HND, the maps show the system needs and current and future network infrastructure projects.

When the HND Is published, there will be an interactive online map and a PDF non-interactive 'flat' map. The 'flat' map appears in the HND publication with all 94 options for 2030. The online map will show all options to 2030 and beyond.

Post-meeting note (07/07/2022):

The map has been amended to show only the options up to 2030. It can be found here: Our Interactive Map | National Grid ESO.

Key notable features Include:

1. The interactive map has filters so that a user can customize the display and focus on the information they want to see.
2. The zoom level has been locked to a maximum level limiting how deep the user could zoom into so see where these projects are being proposed as it is for illustrative purposes and not to expose the precise location of critical national infrastructure.
3. The user can show the system needs and then overlay where the NOA recommends reinforcements to show projects in the NOA aimed to meet these needs.
4. The user can see the ETYS boundary flows for a selected year and switch to the NOA view to see the recommended reinforcements.
5. Selecting a single reinforcement will open a panel with details of what that scheme is, the boundaries it affects and the EISD.

We engaged our TO colleagues in developing this map and taken account of the feedback received.

Questions:

Mr Wright asked If the 11 projects that need acceleration in the HND would be shown as they have an EISD beyond 2030 however, they are needed for the delivery of the 50 GW of offshore ambition?

Mr Matilla responded that they will be shown as needing acceleration with a 'required in service date' of 2030 when the user selects the 2030 view of the network.

Mr Leavy asked If the user was able to change the data behind the map? For example, the map shows two Eastern Links connected to Torness but this will not now be the case. One is planned to connect near Edinburgh.

Mr Matilla responded that the ESO has full access to change the data displayed on the map and will do so shortly. We have received SPT's feedback but have not had time to make these changes yet. The interactive map is planned for launch at the same time as the NOA refresh report.

Mr Adam asked if it is possible to provide access to the tool and to have visibility of the next iteration so that the TOs could verify the option data and descriptions?

Mr Matilla responded that the maps we shared for feedback were screenshots and do not allow user interaction. The option descriptions used in NOA 2021-22 have been re-used in the interactive map except for the NOA 2021-22 refresh descriptions which have been updated. If these descriptions need to be amended then the ESO would encourage the TOs supply updated text.

Mr Adam said that it was important to highlight that the map must show that the network reinforcement projects go beyond 2030 as some very significant options are required to meet the 2030 and 2050 targets.

Mr Matilla responded that this map will aim to show all reinforcement options in the next update.

Post-meeting note (07/07/2022):

The map has been amended to show only the options up to 2030.

Mr Wright thanked Mr Matilla for his presentation.

6. **Analysis background summary**

Mr Wright invited Mr Manicom to present the background to the analysis.

The HND analysis uses the 'Leading the Way+' scenario because this is based on FES 2021.

This achieves 50 GW of transmission connected wind by 2030 and uses a co-ordinated design to reduce the onshore connections. There are fewer radial connections than would otherwise be the case. The analysis includes 23 GW of co-ordinated offshore wind in the HND report. This allows some wind generation to be connected further south, avoiding network constraints. This scenario has an additional 5 GW of offshore wind connecting to England by 2030 in LW21+, compared with LW21. The prevalent power flow is north to south flow due to the distribution of renewables.

The co-ordinated design establishes new offshore transmission routes off the east and west coasts of GB which cross very congested network. This is especially important in providing capacity across B6. The flows will be able to dynamically react to constraints, with the offshore network providing capacity. The co-ordination allows constrained areas of the onshore network to be bypassed by the offshore network.

The single HND scenario, LW21+, achieves 50 GW of offshore wind by 2030 which is a small increase on LW21. The benefit of using a NOA scenario is that the development over time can be plotted. The HND team worked with the FES team to integrate the required changes into FES 2022 scenarios. Reinforcements that were optimal prior to 2030 are 'inherited' due to no significant change in the reasons for them. Every option prior to 2030 has been re-checked to ensure the recommendation is still valid. The TOs only had to re-study year 10 (2030) of these options and submit additional study years so that the value could be captured with EISDs beyond 2030.

Questions:

Mr Wilkes: The reduction in costs in 2030: does this include the 11 accelerated schemes?

Mr Manicom: These costs include 5 accelerated schemes. The optimiser picks the cheaper options up to 2033; it does not see the longer-term view. The co-ordination produces the main cost benefit.

Mr Leslie: If all 11 options were accelerated and delivered before 2030, would the saving be even greater?

Mr Manicom: Yes the constraint costs would be lower. There is a significant financial benefit if we can deliver the co-ordinated design and the reinforcements outlined in the NOA 2021-22 refresh

report. There is still a significant residual constraint into 2040s which shows the need for more co-ordination and onshore reinforcements.

Mr Wright thanked Mr Manicom for his presentation.

7. **Scotland and North of England**

Mr Wright invited Mr Petty to present the Scotland and north of England reinforcements.

This section covers the area from the north of Scotland to the Anglo-Scottish border (boundary B6). The transmission network is operated by SSEN, SPT and NGET. There is a huge increase in north to south power flow between 2022 and 2041 driven by new offshore windfarms. Using the 'Leading the Way +' (LW+) scenario, some windfarms connect further south than was previously planned in LW due to the offshore network. B4 and B5 see an increase in boundary flows due to ScotWind Phase 2.

NOA 2021-22 Refresh results that are optimal:

- Uprate the Beauly to Denny 275 kV circuit to 400 kV (BDUP)
- West coast onshore Anglo-Scottish new circuit (WCNC) and Second west coast HVDC link - Scotland to North Wales (WCD2)
- South east Scotland to north west England AC onshore reinforcement (CMNC) and East coast Anglo-Scottish onshore reinforcement (TLNO)

The constraints on B0 to B2 are relieved and the B4 constraint increases from 2037. The benefits of the commercial solutions are reduced as the constraints overall are reduced.

The recommendations in this region are the same as in NOA 2021-22 for existing options.

- Sensitive options - for discussion.

Two new reinforcements were proposed: West coast onshore Anglo-Scottish new circuit (WCNC) and offshore Second west coast HVDC link - Scotland to North Wales (WCD2). Both of these options provide similar boundary capabilities but the onshore route (WCNC) was almost half the cost of the offshore link (WCD2). The onshore route is recommended to "Proceed" and the offshore route recommendation is "Do not start".

Questions:

Mr Leavy commented that the descriptions of some options could be confusing.

Mr Adam will be checking the description of each option to make them clear.

Mr Petty noted that the slide does not show cable routing and the cost of any option could increase if a large part is underground cable.

Mr Leavy remarked that these reinforcements will require a lot of outages which will be a challenge to deliver as the network has to be kept secure. This may mean that some projects that do not seem viable are needed so that the security of the network is maintained.

Dr Kuri added that Beauly to Denny upgrade (BDUP) has a "Hold" recommendation which is accepted. This scheme is required for some new connections by 2029 and will need co-ordination between HND and NOA refresh so that the messages are consistent.

Dr Kuri welcomed that the NOA 2021-22 refresh covers the time beyond 2030 reflecting the need for continued development.

Dr Kuri said that he would like to see the post-2030 schemes that are represented on the interactive map.

Mr Matilla replied that this request will need some thinking because it is under development but we cannot share the interactive version before it is published.

Mr Leavy said that SPEN will be writing to ESO to request clarification why LCU2 (Eastern B5 400 kV reinforcement) is "Hold" and TKU2 (Alternative east coast onshore phase 2 reinforcement) is "Do not start". SPT will be re-conductoring the route covered by LCU2 and the timing has to be determined to maximise the benefit and minimise outages.

Dr Wakeley: TKUP is an alternative to TKU2. TKUP is an "essential work" under HND and follows the same route corridor as TKU2.

Ms Cressy commented that there is no guarantee that NGET can deliver the 11 schemes that need to be accelerated for HND sooner than their current EISDs. NGET will continue the development work and conversations with the suppliers. NGET needs to be informed on communications and the ESO to carefully manage the messaging of those schemes.

Dr Kuri: "Do not start" is a strong term for the options that are not going to be developed. This is particularly the case for some developments in the far north of Scotland. Near Dounreay some windfarms are expected to connect. The recommendation "Do not start" is perceived by some stakeholders as meaning that the whole scheme is not going to be delivered and that the TO might not continue the development of the connection next year because it is not now needed to connect new windfarms.

Mr Manicom: It is difficult to say where a future optimisation process will recommend that new wind farms should connect.

Dr Wakeley: We can add an explanation that "Do not start" means 'do not start at the moment on the basis of what we know', ["Do not start yet"].

The committee endorsed the list of NOA refresh options.

Mr Wright thanked the TOs and ESO for the co-ordination.

8. **Scottish TOs exit meeting and break**

9. **England and Wales excluding the north**

Mr Wright invited Mr Petty to present details of the options for England and Wales excluding the north. This covers the area of England from boundary B6 to the south coast.

- An additional 4 GW of HVDC capacity across the west coast is required so that B7a has enough capability in 2036.
- Three new overhead lines are needed from south Lincolnshire to north London and East Anglia.
- PSNC is a new north Wales to south Wales option and an HND 'essential option'.
- The commercial options still provide benefit in 2030-2041 but lower benefit than in NOA 2021-22 due to constraints being reduced by other options.

Comparing LW 2021 with LW 21+: the flow across boundary B6 is reduced because some wind generation is connected further south. There is an increase in the capacity required at B9 because of the East Anglia offshore wind connections.

Key changes from NOA 2021-22:

- North west England to Lancashire reinforcement (CLNC) is not needed until after West coast onshore Anglo-Scottish new circuit (WCNC) is in place in 2036. The recommendation for CLNC has changed from "Proceed" to "Hold".
- The New double circuit from south Lincolnshire to Rutland (LRNC) was "Hold" and is now "Stop" because has been superseded by the alternative option LRN4 (New south Lincolnshire to Hertfordshire double circuit).

- Commercial solutions. The results from NOA 2021-22 up to 2030 still stand. They provide less benefit than for NOA 2021-22 due to the constraints being reduced by HND offshore options.

Sensitive cases:

Upgrade Wymondley, Waltham Cross and Tilbury 275 kV to 400 kV (TWNC) is "Proceed".

New south Lincolnshire to East Anglia double circuit (WWNC) is "Hold" because it is not needed until the other options are in place.

LRN4 is "Proceed".

Questions:

Mr Wilkes: Further work will be required to optimise the network between Lincolnshire to north London. We expect this to lead to the development of other schemes.

Mr Wright: The MPs ask what other options are considered. ESO needs to work with NGET to explain why these options were chosen.

Ms Cressy: PSNC is one of the 11 'accelerated schemes'. Is this large acceleration seems unlikely?

Mr Manicom: The offshore connections drive the 2030 RISD for PSNC. NWNC (New network need from North Wales to West Midlands) would also increase capacity for offshore wind but it does not increase the capability of the NW2 boundary and its EISD is also 2037.

Mr Wright: Does an RISD create an expectation that the affected project can be accelerated? If the planning regulations are reformed it should be possible to bring a project forward by one year but reducing this by 7 years with a route across a national park is unlikely.

Mr Leslie: For every year that PSNC is delayed after 2030, there will be additional constraint costs. At some date these costs may make the offshore option, WPDC, more beneficial. Both PSNC (onshore) and WPDC (offshore) should be developed so that the EISDs and benefits can be evaluated. This will be useful evidence to take to the English and Welsh Governments to show the increased cost of delaying an option and inform the Welsh Government's mid-Wales onshore strategy.

The Committee endorsed the results from the CBA.

Mr Wright: Thanked NGET for their tremendous work between the teams and with ESO.

10. **TOs exit meeting**

11. **Date and time of next meeting:**

[Redacted due to administrative nature]

Any other business:

[Redacted due to administrative nature]

Feedback and review

[Redacted due to administrative nature]

Action Item Log

[Redacted due to administrative nature]