nationalgridESO

Meeting minutes

NOA Committee December 2020

Date:	07/12/2020	**Location:**	MS Teams
Start:	10:00 AM	**End:**	15:00 PM

Participants

Attendee	Role in meeting	Job role	Attend/Regrets	Minute(s) attended
Craig Dyke	Chair	Head of ESO Strategy and Regulation	Attend	1-13
Rob Rome	Committee member	Acting Head of National Control, ESO	Attend	1-13
Kayte O'Neill	Committee member	Head of Markets, ESO	Attend	1-13
Julian Leslie	Committee member	Head of Networks, ESO	Attend	1-13
Lauren Moody	Committee member	Energy Analysis Senior Manager	Attend	8-13
Nicholas Harvey	Support member	Network Development manager	Attend	1-13
James Greenhalgh	Support member	Electricity Customer Connections manager	Attend	1-13
Alex Haffner	Acting committee member	Strategic Insight Manager	Attend	1-7
Emmanouil Belivanis	Presenter	Power System Engineer	Attend	9-13
Kelvin Lambert	Presenter	Power System Engineer	Attend	1-13
Jingchao Deng	Presenter	Power System Engineer	Attend	1-13
Francis Vary	Presenter	Power System Engineer	Attend	9
Sean Williams	Presenter	Economics Engineer	Attend	1-13
Thomas Petty	Presenter	Economics Engineer	Attend	1-13
Jason Hicks	Observer	Technical Economic Assessment team manager	Attend	1-13
Paul Wakeley	Observer	Economic Assessment team manager	Attend	1-13
James Whiteford	Observer	System Capability manager	Attend	1-13
External Participants				

Thomas Johns	Observer	Ofgem	Attend	1-7
James Norman	Observer	Ofgem	Attend	8-13
Neil Copeland	Observer	Ofgem	Attend	1-13
Niall McDonald	Observer	Ofgem	Attend	1-13
Bless Kuri	Presenter	Head of System Planning and Investment – SHE Transmission	Attend	5-9
Roddy Wilson	Presenter	Network Planning Manager – SHE Transmission	Attend	5-9
Eric Leavy	Presenter	Head of Transmission Network – SP Transmission	Attend	5-9
David Adam	Presenter	Transmission Network Manager – SP Transmission	Attend	5-9
Kirsten McIver	Presenter	SP Transmission	Attend	5-9
Mark Perry	Presenter	Network development - NGET	Attend	7-11
Nicola Todd	Presenter	Connection Portfolio Manager – NGET	Attend	7-11
Le Fu	Presenter	NOA Lead – NGET	Attend	7-11
Manomay Roy	Presenter	Planning Power System Engineer - NGET	Attend	7-11

Discussion and details

1. Apologies and introductions

Mr Dyke welcomed all attendees and introductions were made

2. Meeting governance and process

[Redacted due to administrative nature]

3. Minutes of the NOA Committee meeting held on 8 October 2020

The draft NOA committee minutes for the meeting held on 8 October 2020 (the "Minutes"), as circulated prior to the meeting, were taken as read. Mr Dyke requested the members and attendees to provide any final comments.

There were no further comments and accordingly the Minutes were **APPROVED** as an accurate record and **APPROVED** for signature by the Chair.

4. Actions arising from the NOA Committee meeting of 8 October 2020

Mr Dyke invited Mr Williams to provide an update on Action 15.1 and the following points were noted:

4.1 Action 15.1 - Investigate the impact on demand due to COVID-19 on marginal options

- Mr Williams explained that sensitivity studies, looking at the impact the lower demand would have on constraint costs were carried out for the next 3 years:
  - The impact on network constraint costs is minimal and does not affect the NOA recommendations
- The driver for marginal cases remains as generation background changes across the four scenarios.

5. Scotland and the North of England (with all TOs present)

5.1 NOA recommendation definitions and overview

- Mr Dyke invited Dr Deng to provide an overview of the NOA results and recommendations and the following points were noted:
- 171 options were submitted into the NOA
- 58 non-marginal options are not optimal in any scenario, and our recommendation for each of these is either 'Stop' or 'Do not start'.
- 78 non-marginal options are optimal but non-critical, and our recommendation is to put these options on "Hold" until there is greater certainty in the future.
- 35 options are optimal and critical which entered the single year least worst regret (LWR) analysis:
  - 3 options to "Delay".
  - 32 non-marginal options to "Proceed" with.
- 6 cases will be presented as marginal..

5.2 Regional results - Optimal path & narratives

Mr Dyke invited Dr Deng to provide an update on Scotland and the North of England and the following points were noted:

- There are three net zero scenarios in FES 2020, Steady Progression is the only one that does not meet net zero. The 2020 scenarios have triggered more reinforcements this year. There are 62 optimal in total as compared to 45 in last year's optimal paths.
- Steady Progression had the least number of optimal options, around 45, where as other net zero scenarios require at least 55 reinforcement options.

- Optimal options tend to cluster at certain years because in the North region, the boundaries are nested, so smaller reinforcements have to work with large reinforcements to maximise benefit, such as when the first eastern link is delivered in 2027 and the third link in 2031.

ESO led commercial solutions

- Commercial solutions are considered in the north region around Scottish central belt (B2 and B4) and Anglo-Scottish border (B6 and B7a). Each area has two options which works incrementally.
- The two commercial options on the Anglo-Scottish border were found beneficial whilst the Scottish central belt ones were not.
- The CBA was run with and without the commercial solutions to investigate the impact of them on TOs options.

Non-marginal options/recommendations

- Eastern HVDC link from Torness to Hawthorn Pit (E2DC), Peterhead to Drax (E4D3), Peterhead to the South Humber (E4L5) have the same recommendation as last year. There is also a need to "Proceed" with a fourth eastern link - TGDC. It is a new option in NOA 2020/21.
- In central Scotland, east coast onshore reinforcements have been in the NOA for many years and remain strong cases to "Proceed".
- It is recommended to "Proceed" two new options, Beauly to Blackhillock new double circuits (BBNC) and Beauly to Loch Buidhe 275kV reinforcement (BLN2).
- West, central Scotland, Hunterston East to Neilston 400kV reinforcement (HNNO) facilitates the flows through the western link and also additional capability following the closure of Hunterston power station.
- Eccles hybrid synchronous compensator (ECVC) is justified for its thermal and voltage capabilities.
- CMNC is a new circuit from South East Scotland to North West England it is recommended to "Proceed" with this option over the alternative TLNO (Torness to north east England AC onshore reinforcement) that was recommended last year
- Harker supergrid transformer replacement (HAE2) and the transformer banking arrangement (HAEU) are upgrades at Harker to enable the flows crossing B6
- Additional power control devices at both Harker and Penwortham (MRP2) will allow greater power control capability across the circuits between Penwortham and Harker
- A new 275kV double circuit between Osbaldwick and Poppleton (OPN2), is one of the central Yorkshire reinforcements that is required to enable flows across B7a, especially when the Eastern subsea HVDC Link from Torness to Hawthorn Pit (E2DC) is delivered.
- Thornton series reactor (THS1) received the same recommendation as last year and continues to receive a strong "Proceed" signal.
- South Humber area substation upgrade (SHNS), new double circuits from Creyke Beck to the South Humber (CGNC) and South Humber to South Lincolnshire (GWNC) are considered as onshore upgrades to the Eastern Links, which transform the power injection by the Eastern links into the rest of the network.
- The new 400kV double circuit between Ratcliffe and Chesterfield (EDNC) that crosses B8 has a very strong economic case, as it is needed to achieve the highest capability for the midlands
- 2 commercial solutions (CS05 and CS06) for B6 and B7a, are both critical and optimal across all scenarios.

Mr Dyke asked what the key messages were, Dr Deng mentioned that:

- A lot more options are being triggered and considered critical than previous NOAs due to the net zero targets in the new FES 2020. In addition, the TOs have submitted many new options which the CBA has found supersedes some of the recommendations made in the previous NOA.
- Eastern Links are very crucial and due to the background change, we have one more link added in the optimal path on top of three recommended in previous NOA

- Mr Perry added that GWNC (new double circuit between the South Humber and South Lincolnshire), was critical not just to take power out when the Eastern Link comes, but also being built to connect new offshore generations. It was noted that the driver for its timing could be generation connections.
- Mr Johns sees a more appropriate place to capture the consumer value in the SWW needs case.

Action 16. 1 - Investigate the economic impact of advancing the Eastern HVDC links

NOA 2020/21 key changes from last year

- With FES 2020 background changes NEP1 has received a “Hold” as it does not increase capability on B6 where constraints sit at the early 2020s this year.
- Reconductor Norton to Osbaldwick circuit (NOR2) was superseded by its alternative NOR5, reconductor the same circuit to a higher rating.
- Torness to Cottam Offshore HVDC (E2D2), this year the message is that this recommendation should stop, the link to Hawthorn Pit (E2DC) is found to be a better option.
- Mr Johns asked if there was a change in EISD, that could that be the reason for the change in recommendation this year. Dr Deng said that the EISD has slipped 2 years. Mr Perry mentioned that the preference last year was to “Proceed” the E2DC (Horthorn Pit), if both could not be "Proceed", as suggested by NOA 19/20. Dr Deng said that the E2D2 link is longer and more costly, E2DC can also be delivered 2 years earlier.
- Mr Johns said the initial needs case reflects that the link has been dropped back for 2 years. Ms Todd confirmed that the dates in the needs case is consistent with that submitted to this NOA.
- Torness to north east England onshore reinforcement (TLNO) has been superseded. It does not provide sufficient capability and therefore the message is that this option should "Stop".
- Tee-in of the West Boldon to Hartlepool circuit at Hawthorn Pit (WHTI) received a “Hold” and is a sensitive case. This will be discussed later in the committee.
- Beauly to Blackhillock new double circuits (BBNC), Beauly to Loch Buidhe 275kV reinforcement (BLN2) and Denny North-Clydesmill-Wishaw circuit upgrade (DWUP) (marginal case) these options now receive a “Proceed” recommendation.

Mr Perry asked why NOR5 is on “Hold” while NOR2 was “Proceed” in previous NOA. Dr Deng mentioned that NOR5 is needed much later than in early years.

5.3 Marginal options/recommendations

Mr Dyke invited Mr Petty to give a refresher on LWWR (Least Worst Weighted Regret) and the following points were noted:

- This is the first time that LWWR has been used on real NOA data and presented to the committee.
- The output of LWWR will be used for the enhancing the discussion of marginal cases this year. Allowing the committee to see the effect of varying the probability of each scenario occurring.
- This method does not replace implied probability and is complimentary as the analysis uses different inputs.

Mr Dyke invited Dr Deng to provide an update on Scotland and the North of England and the following points were noted:

Case 3: (DWUP + DWN2 vs DWNO) Scottish central belt options

- The two are alternatives and both have a strong case as they are required for all Scottish boundaries. The combination of reinforcements, DWUP (Denny North-Clydesmill-Wishaw circuit upgrade) plus DWN2 (alternative Denny to Wishaw 400kV Reinforcement), provides a higher capability; while DWNO (Denny to Wishaw 400kV single circuit reinforcement) has a lower overall cost.

- Analysis showed that DWNO is favoured in Steady Progression, and the combination (DWUP+DWN2) is required in all other scenarios. However, in the previous NOA, the need was seen for DWNO.
- The Least Worst Regret (LWR) suggests "Proceed" for both. The combination (DWUP and DWN2) showed lower regret values as compared to DWNO.
- DWUP and DWN2 are Mutually exclusive, only one can be delivered. However, the recommendation is to keep both reinforcements open this year until reassessed in future NOAs, i.e., **to "Proceed" both DWUP and DWN2**.

Case 6: (WLTI) Windyhill–Lambhill–Longannet 275kV circuit turn-in to Denny North 275kV substation

- WLTI is a prerequisite of all other B5 reinforcements, and is critical in all net-zero scenarios.
- The case is marginal because the difference in regret in "Delay" and "Proceed" recommendations are minimal. LWWR was presented to demonstrate the margin in a "Delay" recommendation in Steady Progression versus the other scenarios. The weight of Steady Progression would need to be reduced in order to change the result from "Delay" to "Proceed".

Mr Dyke asked what this means in real world terms.

Dr Deng explained LWWR gives an idea of how much we would need to shift one scenario's probability in order to overturn the recommendation. Further investigation shows the main driver for this option is Firth of Forth windfarm, since both the TEC register (showing 2021) and latest modernisation programme suggest the windfarm will not be delayed to 2023 as seen in Steady Progression, the recommendation has been changed to "Proceed".

Based on the evidence presented, the Committee agreed with the recommendation to "Proceed" with this option.

Case 7: CDHW - Cellarhead to Drakelow circuits thermal uprating

- The option is critical in all scenarios except Steady Progression due to lower flows across B8 in this scenario. The economic results suggest a "Delay" this option based on the regret in Steady Progression.
- LWWR shows that the weight of Steady Progression would need to be reduced in order to change the result.
- Steady Progression is seen as the scenario least likely to occur as compared to the other FES 2020.
- The decision could not be reached by the Committee with the current evidence and further investigation is required.

Action 16. 2 – Provide further information about the drivers behind the CDHW recommendation.

Case 8: CTP2 - Alternative power control device along Creyke Beck to Thornton

- Optimal in all scenarios but only critical in Leading the Way.
- The LWWR analysis produced no clear recommendation. **The recommendation is to "Proceed" with this option** due to very low next year spend and relatively higher LWR.

Based on the evidence presented, the Committee agreed with the recommendation to "Proceed" with this option.

5.4 Sensitive options

Case 2: Eastern HVDC Links

There is a need for 4 links in this year's background. The recommendation is to "Proceed" with four options to maintain their EISDs. However, the final recommendation should be determined by the SWW/LOTI process.

Case 4: CMNC - South East Scotland to North West England AC onshore reinforcement

- Amongst all the alternatives CMNC provides the highest capability.
- TLNO is superseded by CMNC

Based on the evidence presented, the Committee agreed with the recommendation to "Proceed" with this option.

Case 5: EDNC - Uprate Brinsworth and Chesterfield to double circuit to 400kV and a new 400kV double circuit between Ratcliffe and Chesterfield

- This option is driven by the high flows across B8.
- It is 'critical' in Leading the Way and Consumer Transformation but not required in Steady Progression.
- LWR showed a strong case to “Proceed”.

Based on the evidence presented, the Committee agreed with the recommendation to "Proceed" with this option.

Case 9: WHTI - Tee-in of the West Boldon to Hartlepool circuit at Hawthorn Pit

- WHTI has been the NOA for a number of years.
- ESO's view is that WHTI should “Proceed”.

Based on the evidence presented, the Committee agreed with the recommendation to “Proceed” with this option.

Mr Perry asked for the ESO to explain the impact CLNC (Harker to Heysham double circuit) had after B8 has been reinforced by additional options, and also raised a concern that B6 now suggests having two double circuits above and below the boundary.

Action 16. 3 – Provide further information about the reasons for CLNC not being optimal in this year’s NOA

[Redacted due to commercially sensitive nature].

5.5 Key messages for publication

Mr Dyke invited Mr Matilla to provide an update on key messages for the NOA 2020/21 report and the following points were noted:

- The NOA report includes sensitive material about options, especially those where the recommendation has changed or for significant reinforcements. This will be considered in the drafting and engagement will be done with the TOs to ensure wording is appropriate.

6. Offshore Wider Works

Mr Dyke invited Mr Lambert to provide an update on Offshore Wider Works (OWW) and the following points were noted:

- Six conceptual OWW reinforcements have been created with data for NOA analysis.

- The economic analysis that will be done will be using Bid3 and is a proof of concept. The assessment will not alter this year's recommendations. As the analysis is being done in December the results will be presented in January.
- The sections of the report that are not based on results are at an advanced stage of drafting and are being developed with input from the ESO offshore coordination project (OCP) .

6.1 LOTI and SWW projects

Mr Dyke invited Mr Lambert to provide an update on LOTI and SWW projects from the NOA and the following points were noted:

- 11 options that received a "Proceed" meet the LOTI criteria
- 8 options meet the SWW criteria.

7. East Coast SWW updates

Mr Dyke invited the Transmission Owners to provide an update on East Coast SWW and the following points were noted:

- Ms McIver gave an update in the October NOA Committee meeting. The first two Eastern links have had initial needs cases submitted to Ofgem. They are progressing for the final needs case, with submission expected by the end of 2021.
- Started the seabed surveys for Torness to Hawthorn Pit (E2DC). with Peterhead to Drax (E4D3) due to begin early next year (Q1 or early Q2).

Scottish TOs exit meeting

8. England and Wales excluding the north of England

8.1 Regional results for Wales

Mr Dyke invited Mr Williams to provide an update on Wales region and the following points were noted:

- Due to low network flows in the previous year no options were submitted in Wales. All options submitted this year are new.
- 4 options were studied in the region with NW2 and SW1 being the key boundaries. All options were found to be optimal in at least one scenario.
- North Wales reinforcement (PTNO) has received a "Proceed" recommendation.
- The driver for the optimal path is due to high generation capacity in the area driven by nuclear and biomass technology.

8.2 Marginal options/recommendations for Wales

Mr Dyke invited Mr Williams to provide an update on Wales region and the following points were noted:

Case 1: PTNO, North Wales reinforcement

- This option helps to reduce constraints on the NW2 boundary. Offshore wind, nuclear and biomass is seen as the key driver for this reinforcement.
- The recommendation is to "Proceed" the option and is supported by LWWR.

Mr Dyke asked about in real terms what the LWWR showed. Mr Williams said that in order to change the decision the likelihood of System Transformation occurring would need to be reduced.

The Committee requested further Information on the drivers before making a decision PTNO.

Action 16. 4 – Provide further information about the drivers behind the PTNO recommendation.

8.3 Regional results for South Region

Mr Dyke invited Mr Williams to provide an update on South region and the following points were noted:

- Forecasted constraints in the south region are primarily driven by three factors:
  - An increase in flows that arrive from the North.
  - An increase in offshore wind generation connecting in East Anglia.
  - An increase in exports through southern interconnectors. With three scenarios turned into exporter driven by the Net-Zero target
- Key options submitted last year are optimal again this year, including the Bramford to Twinstead new route and offshore HVDC link between Suffolk and Kent.
- Three new options submitted this year which are new circuits along the east coast are optimal
- Outage planning restrictions result in a significant impact on optimal delivery years and recommendations. (This is covered in more detail in Agenda item 9)
- Results for the optimal path are as follows:
  - 13 more options are selected in the optimal path this year than last year. NGET has provided lots of alternative options to try and tackle the net zero scenarios.
  - 3 early options (Reconductor remainder of Rayleigh to Tilbury circuit RTRE, Reconductor remainder of Coryton South to Tilbury circuit CTRE, Reconductor remainder of Bramford to Braintree to Rayleigh route BRRE) are required on their EISD, this is seen in all four scenarios.
  - Several options in the early years are subject to outage conditions, which may impact their optimal delivery year.
  - There are 2 commercial solutions in the optimal path
  - Late 2020s to early 2030s has seen some larger scale reinforcements, i.e. circuit upgrades and new overhead lines. The key options - Bramford to Twinstead new route (BTNO), and the uprate of Hackney, Tottenham and Waltham Cross route to London (HWUP). These are also pre-requisites to larger reinforcements later in the path. Again these options are subject to outage clashes and therefore will change what can be delivered in the later years.
  - Large projects are beneficial in the later years, such as the new HVDC link between East Anglia and South Coast, and three new circuits between Thames Estuary to East Anglia.
  - Thames Estuary reinforcement (TENC) is critical in Steady Progression to provide an onshore route and will be discussed as a marginal case.
  - Due to the outage clashes, there is quite a high economic penalty, as the network will remain under reinforced until all these reinforcements can be built.

Commercial solutions

- 4 ESO-led commercial solutions have been considered this year in the south region, with two across East Anglia (EC5) and two across South-east coast (SC1 and SC3)
- Only EC5 options show benefit in the early years to relieve constraints.
- None of the commercial solutions have an impact on asset based options delivery date.

Non-marginal options

- Three reconductor scheme, with short lead time were given a “Proceed”, they are RTRE (Reconductor remainder of Rayleigh to Tilbury circuit), CTRE (Reconductor remainder of Coryton South to Tilbury circuit) and BRRE (Reconductor remainder of Bramford to Braintree to Rayleigh route).
- RTRE and CTRE reinforces the London export boundary
- BRRE reinforces the East Anglia region
- Are important pre-requisites to the later reinforcement and is imperative to deliver on its EISD.

Key changes to last year

- SEEU (Reactive Series Compensation protective switching scheme) is still optimal but not required on its EISD this year. The main drivers are:
  - the differences in capabilities it can provide in the early years; and
  - it works well with the two MSCs at Ninfield (NIM1 and NIM2), which come a few years later than the EISD of SEEU
- CTRE has changed from "Hold" to “Proceed” in this NOA. This is due to the EISD being brought backward a year.
- MBHW (Bramley to Melksham circuits thermal uprating) has changed from “Proceed” to “Hold” this year. It was marginal last year driven by only one scenario. Also, there is slightly less solar in the southwest region this year, meaning that this reinforcement isn't required on its EISD of 2023.
- All the other options have been changed from “Proceed” to "Hold". They are fundamentally affected by outage restrictions and will be discussed in detail in agenda item 9.

8.4 Marginal options/recommendations for South Region

Case 1 TENC – The new 400kV double circuit between Tilbury and Grain

- It is required in 3 out of 4 scenarios and is critical in Steady Progression only.
- The requirement of delivering it on its EISD in this scenario is driven by the capability it provides to SC3, which experiences quite a lot constraints in the early and later years when interconnectors are importing. This tends to happen the most in Steady Progression.
- LWR analysis suggests “Proceed” the option.
- The regret "Proceed" in Leading the Way and Consumer Transformation is much lower,
- The LWWR analysis supports the decision to "Proceed".

Based on the evidence presented, the Committee agreed with the recommendation to “Proceed” with this option.

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9. Network access in the south and east region

[Redacted due to commercially sensitive nature].

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10. South Coast SWW updates

Mr Dyke invited the Transmission Owners to provide an update on East coast SWW and the following points were noted:

Dr Fu updated in October and was still in strategic optioneering stage.

- HVDC link between Suffolk and Kent. In November the project was moved to detailed scheme development.
- The next stage of development, the details will be looked at, such as seabed surveys. Stakeholder engagement will also take place in local councils.
- Contracting strategy will also be formed.
- Initial needs case will be made to Ofgem and discussions.
- Highlighting the outage clashes, this year's recommendation will play a key role, therefore depending on "Hold" or “Proceed”.

10.1 SWW/LOTI

- LOTI options in the south and west of England that received a “Proceed”.
- Two options TENC (Thames Estuary reinforcement) and PTNO (North Wales reinforcement), do not meet the SWW threshold.

11. Date and time of next meeting

The next meeting will be held on Tuesday 12 January 2021

12. Any other business

[Redacted due to administrative nature].

13. Feedback and review

[Redacted due to administrative nature].

Action Item Log

Action items: In progress and completed since last meeting

ID	Description	Owner	Due	Status	Date
15.1	Investigate the impact on demand due to COVID-19 on marginal options	Mr Williams	08/12/2020	Complete	08/12/2020

Action items: New

ID	Description	Owner	Due	Status	Date
16.1	Investigate the economic impact of advancing the Eastern HVDC links	Ms Jiang	12/01/2021	New	08/12/2020
16.2	Provide further information about the drivers behind the CDHW recommendation.	Dr Deng	12/01/2021	New	08/12/2020
16.3	Provide further information about the reasons for CLNC not being optimal in this year’s NOA	Mr Li	12/01/2021	New	08/12/2020
16.4	Provide further information about the drivers behind the PTNO recommendation.	Mr Williams	12/01/2021	New	08/12/2020