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15 December 2021

Mr Hugo Klingenberg
Manager Network Development
ElectraNet
PO Box 7096
Adelaide, SA 5000
Via email: Klingenberg.hugo@electranet.com.au

Dear Hugo,

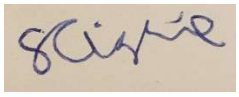
## AEMO review of ElectraNet Network Capability Incentive Parameter Action Plan (NCIPAP) for 1 July 2023 to 30 June 2028

I am writing to provide AEMO's review of your proposed projects in the ElectraNet NCIPAP for the regulatory period from 1 July 2023 to 30 June 2028. This review is provided in compliance with clause 5.2 of the Service Target Performance Incentive Scheme (STPIS)[1].

ElectraNet proposed four NCIPAP projects as summarised in Attachment 1. AEMO agrees with ElectraNet's assessment of the project need, improvement targets, likely material benefits and ranking of proposed projects. AEMO's assessment is provided in the same attachment.

If you have any questions or would like to seek any clarification, please contact Nadesan Pushparaj @nadesan.pushparaj@aemo.com.au.

Yours sincerely



**Samantha Christie**
Manager Network Planning

cc: Mr Warwick Anderson, General Manager, AER

[1] AER. Service target performance incentive scheme. https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/service-target-performance-incentive-scheme-version-5-september-2015-amendment.

ElectraNet: NCIPAP proposals for the regulatory period 1 July 2023 - 30 June 2028
AEMO Review - November 2021

| Sourced from ElectraNet | | | | | | | | | | | AEMO Review | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project name** | **Transmission circuit/Injection point** | **Scope of works** | **Current limit and reason for the limit** | **Target limit** | **Completion date** | **Capital cost estimate ($M)** | **Operating cost estimate ($M)** | **Market benefit per annum ($M)** | **Pay back period** | **Rank** | **Review of material benefit** | **Benefit category** |
| Robertstown to Tungkillo 275 kV line uprating | Robertstown - Tungkillo 275 kV line and Robertstown - Para 275 kV line. | Uprate operating temperature of the Robertstown - Tungkillo and Robertstown - Para 275 kV lines from 100ºC to 120ºC to achieve increased thermal capacity.<br><br>This work involves:<br>(1) Upgrade 7 spans of Robertstown-Tungkillo 275 kV line, and<br>(2) Upgrade 8 spans of Robertstown-Para 275 kV line. | Thermal capacity - Summer/Autumn-Spring/Winter:<br>(1) Robertstown-Tungkillo 275 kV line: 597/617/677 MVA.<br>(2) Robertstown-Para 275 kV line: 603/624/684 MVA | Increase thermal capacities of Robertstown-Tungkillo and Robertstown-Para 275 kV lines to 701/717/766 MVA (Summer/Autumn-Spring/Winter). | Planned completion date:<br>FY 2022-23 | 2.43 | 0.00 | 3.60 | 1 year | 1 | ElectraNet listed a number of potential anticipated renewable generation projects, including:<br>380 MW in Northern SA in December 2021,<br>903 MW in Riverland in October 2023, and<br>396 MW in upper Mid North SA in April 2024.<br><br>AEMO considers that additional generation in Northern SA, Riverland and upper Mid North SA would increase the loading on the Robertstown-Tungkillo and the Robertstown-Para 275 kV lines above their current thermal capacity.<br><br>AEMO considers that the proposed uprating of the Robertstown-Tungkillo and the Robertstown-Para 275 kV lines will provide material market benefits, in the case that above referred new generation connections are committed. | Market benefits due to improved access to low-cost generation |
| Davenport to Cultana line uprating | Corraberra Hill - Cultana 275 kV line<br>Davenport - Cultana No2 275 kV line<br>Davenport - Corraberra Hill 275 kV line | Increase thermal capability of Davenport-Corraberra Hills-Cultana and Davenport-Cultana 275 kV circuits with following works:<br>(1) Lift one span of the Davenport - Cultana No2 275 kV line to increase the maximum operating temperature from 80ºC to 100ºC.<br>(2) Change metering current transformer (CT) ratios at Davenport, Cultana and Corraberra Hill substations to allow for increased ratings.<br>(3) Replace limiting droppers at Davenport and Cultana substations to allow for increased ratings. | Current Summer/Winter rating of Davenport-Corraberra Hill-Cultana and Davenport-Cultana 275 kV transmission circuits is 457 MVA. | Target ratings of Davenport-Corraberra Hill-Cultana and Davenport-Cultana 275 kV circuits are 597/617/677 MVA (Continuous ratings Summer/Spring Autumn/Winter) and, 701/717/766 MVA (the 15-minute short-term Summer/Spring Autumn/Winter). | Planned completion date:<br>FY 2024-25 | 1.53 | 0.00 | 0.61 | 3 years | 2 | ElectraNet identified due to strong rooftop PV development in the Eyre Peninsula, generation from Lincoln Gap (212 MW total committed), Mount Millar (70 MW), Cathedral Rocks (66 MW) wind farms and any additional new generation at Cultana or south of Cultana (Eyre Peninsula) must flow from the Eyre peninsula to Davenport. Those wind farms generation will cause congestion on the Cultana-Davenport 275 kV transmission paths during high PV periods.<br><br>AEMO considers that the proposed uprating of the Davenport to Cultana lines will provide material market benefits by reducing the network constraints at the times of increased generation in Eyre Peninsula. | Market benefits due to improved access to low-cost generation |
| 10-band rating NCIPAP project | All transmission lines across the network in South Australia with priority in the Mid - north region. | This work involves<br>(1) Develop a strategy to apply a 10-band static rating, which is expected to provide increased ratings for a majority of the time, with a small downside risk of lower rating than currently applied for a small period of time when the temperature is extremely high.<br>(2) Implement the new rating methodology to the Mid North region and Integration with EMS<br>(3) Expand the 10 band static ratings to other regions if applicable | Currently the South Australian transmission network operated on a 3-temperature band static rating with a fixed pre-defined rating for each temperature band. Thermal ratings are defined for summer, winter and autumn /spring seasons. | 10-band static thermal rating for transmission lines in the Mid North region (10% average improvement in ratings when constraints bind) | Planned completion date:<br>2028 | 1.80 | 4.15 | 1.25 | 5 years | 3 | An outage of Robertstown-Tungkillo/Para results in congestion in Robertstown-Waterloo-Templers 132 kV lines. This congestion would increase after Project Energy Connect commissioning and additional new generation in Mid North SA. Improved rating on these 132 kV lines in Mid North SA would reduce constraints on renewable energy dispatch.<br><br>AEMO considers that the proposed 10-band static rating will provide higher thermal ratings compared to current application of 3-band static rating for the Robertstown-Waterloo-Templers 132 kV lines. This would allow to dispatch increased generation from Mid North SA. | Market benefits due to improved access to low-cost generation in South Australia. |

| Sourced from ElectraNet | | | | | | | | | | | AEMO Review | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project name** | **Transmission circuit/Injection point** | **Scope of works** | **Current limit and reason for the limit** | **Target limit** | **Completion date** | **Capital cost estimate ($M)** | **Operating cost estimate ($M)** | **Market benefit per annum ($M)** | **Pay back period** | **Rank** | **Review of material benefit** | **Benefit category** |
| Increase Murraylink transfer capability | Monash and North West Bend 132 kV substations | This work involves:<br>(1) An additional 15 MVAr capacitor bank at Monash 132 kV substation or North West Bend 132 kV substation, including an automated capacitor switching control system to manage voltage and reactive power support.<br>(2) Upgrade the existing runback control scheme of Murraylink to include bi-directionality and allow it to run forward if required. | Export limit of Murray link is currently capped at around 100 - 170MW subject to availability of existing capacitor bank at the Riverland 132 kV network and combined instantaneous MW load at Berri, North West Bend, Morgan-Whyalla Pump 1, Morgan-Whyalla Pump 2 and Morgan-Whyalla Pump 3 connection points.<br><br>Murraylink Export Limit Equations (SA to VIC): SVML^NIL_MH-CAP_ON | Murraylink SA to VIC transfer increase of 15 MW.<br><br>Murraylink Export Limit Equations (SA to VIC): SVML^NIL_MH-CAP_ON + 15MW | Planned completion date:<br>FY 2023-24 | 5.02 | 0.00 | 0.71 | 7 years | 4 | SA to VIC transfer via Murraylink is limited by voltage stability issues in Riverland radial network. ElectraNet estimated exports from SA to VIC across Murraylink corridor will increase with an addition of 15 MVAr capacitor bank at the Riverland 132 kV network.<br><br>AEMO considers that the additional export capacity (15MW) in Murraylink will allow to dispatch additional renewable generation from SA to VIC. | Market benefits due to improved access to low-cost generation in SA |