WA's electricity grid constraints highlight strategic advantage of the Bristol Spring Project

Frontier Energy Limited (ASX: FHE; OTCQB: FRHYF) (**Frontier** or the **Company**) engaged independent specialist energy and resources consultancy ResourcesWA, to undertake an assessment (the Report) of Western Australia's major electricity network, the South West Interconnected System (SWIS).

The Report focused on evaluating potential capacity for large scale connections at existing substations and terminals across the 330kV and 220kV transmission network, from now until 2032.

This Report was commissioned by the Company to gain a better understanding of new large-scale developments on the SWIS, similar to the potential of the Bristol Spring Renewable Energy Project (the **Project**) in the short to medium term.

The development of multiple, large scale energy projects on the SWIS would affect wholesale electricity prices (if supply outstripped demand) and therefore potential returns on Frontier's Stage One Project development that is planned to commence in 2024.

The Report however concluded that "***there are no other opportunities that exist on the SWIS for the development of a connected generator of the scale of the Bristol Spring Renewable Energy Project in the short or medium term***". The reasons for this include:

- **The North Region is limited due to the existing thermal constraints** on the 330kV and 132kV transmission networks in this region (see map below for region locations);

- **The East Region does not present any opportunities** for large scale network connected generation in the near term due to limitations of the 220kV transmission. Limitations on transfer capacity from Merredin west limit new generation in the middle area of the East Region, with new wind developments at Kondinin absorbing transmission capacity between Merredin and Collie;

- **The South Region Terminals present immediate and near term opportunities** for large scale network connection.

  However, within the 330kV network both Oakley and Kemerton are dependent upon existing industrial loads, with Kemerton already at its upper limits due to industrial loads within the Kemerton industrial area.

  The Collie region, including the Muja and Bluewaters substations, have substation connection and transfer capacity within the 330kV network, and will present opportunities following the closure of the coal-fired power stations (planned for 2029). However, the region is surrounded by State forests, limiting land availability, with the majority of cleared land currently mined for coal and requiring rehabilitation post 2030; and

- **Until 2030, only Landwehr Terminal (where the Project is located) can readily accommodate new large scale renewable connections of 250MW or greater**. It is expected that a number of Behind the Meter connections will be developed by industry whilst smaller scale renewable and large scale battery storage are expected

to be developed in conjunction with existing generators at selected substations and terminals.

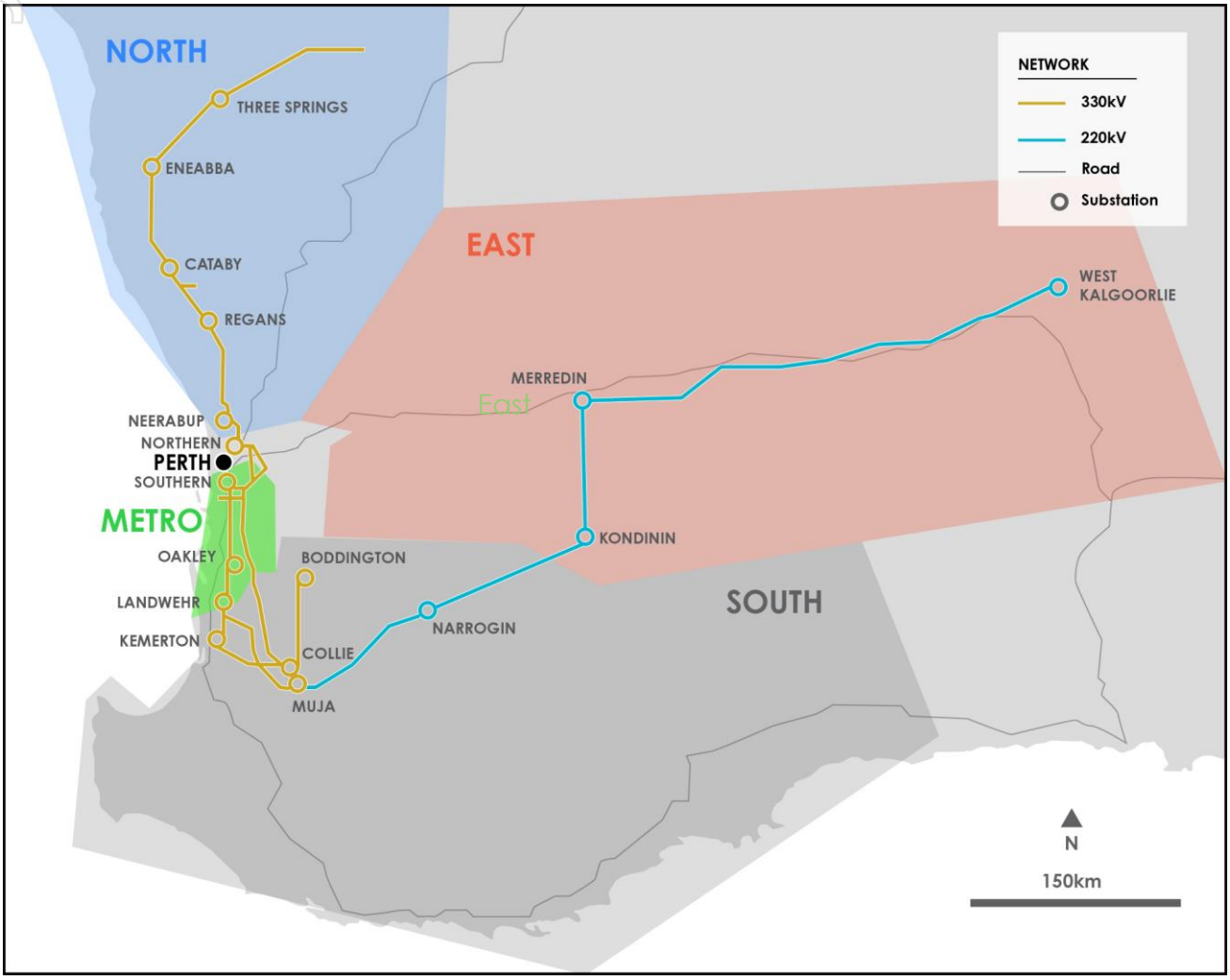

Figure 1: SWIS 330kV – 220kV network and Regions

The Report supports the Australian Energy Market Operator annual Wholesale Electricity Market Electricity Statement of Opportunities (ESOO Report), which stated "the urgency of advancing generation, storage, demand side management and transmission projects to bolster reliability and support a rapid and orderly energy transition. Its findings emphasise the need for additional capacity procurement and expedited progress of capacity projects in the SWIS." The ESOO Report also highlighted demand is forecast to increase significantly over the next decade to at least 78% (Expected Case), with an Upside Case increasing by more than 220%.

A copy of the ESOO "Report is attached to this announcement.

Frontier Managing Director, Sam Lee Mohan, commented: *"While we always believed the Bristol Springs Renewable Energy Project was the best undeveloped renewable energy project in WA, we did not appreciate that it is the only project of its size that can access the*

SWIS network in the short to medium term. This again highlights what a unique opportunity the Company has with the Project, as well as the growing importance of the Project to the State, at a time when energy prices are continuing to rise and energy security is becoming more important than ever.

The next few months are shaping up as the most significant in the Company's history with multiple major events on the horizon. First, we expect to complete the acquisition of Waroona Energy Inc. in December 2023. This transaction will then be followed by a DFS for Waroona's Stage One Solar development (120MW) as well as the Peaking Plant Study expected to be released in 1Q24."

Figure 1: Artist impression of the Solar facility and peaking plant on Waroona's landholding

Authorised for release by Frontier Energy's Board of Directors.

To learn more about the Company, please visit www.frontierhe.com, or contact:

Sam Lee Mohan
Managing Director
+61 8 9200 3428
sam.leemohan@frontierhe.com

Martin Stulpner
Corporate Development Manager
+61 8 9200 3428
martin.stulpner@frontierhe.com

FRONTIER ENERGY LIMITED

NETWORK ENERGY CAPACITY REVIEW

PREPARED BY:
ResourcesWA Pty Ltd
19 Howard Street
Perth WA 6000
www.resources-wa.com.au

DATE: 24 October 2023

DISCLAIMER

ResourcesWA Pty Ltd (ResourcesWA) has prepared this Report for Frontier Energy Limited ("Frontier Energy") and, in so doing, has utilised information (as of September 2023) provided by Frontier Energy, its contractors and consultants and in part on information not within the control of either Frontier Energy or ResourcesWA. Where possible, this information has been verified from independent sources with due enquiry in terms of all material issues.

The use of this report and the information contained herein shall be at the user's sole risk, regardless of any fault or negligence of ResourcesWA. Although the information, and analysis will be reliable under the conditions and subject to the limitations set forward herein, ResourcesWA does not guarantee their accuracy.

Although reasonable care has been taken to ensure that the facts stated in this document are accurate and that the opinions expressed are fair and reasonable, no representation or warranty, express or implied, is made as to the fairness, accuracy, completeness or correctness of the information and opinions contained in this document and no reliance should be placed on such information or opinions. None of Frontier Energy, its subsidiary companies or ResourcesWA or any of their respective members, directors, officers or employees nor any other person accepts any liability whatsoever for any loss, however arising, from any use of such information or opinions (save in respect of fraud).

No reliance should be placed on the information and no representation or warranty (expressed or implied) is made by Frontier Energy or ResourcesWA, or any of their respective directors or employees or any other person, and save in respect of fraud, no liability whatsoever is accepted by such person in relation thereto.

CONTENTS

TABLES AND FIGURES

1 EXECUTIVE SUMMARY

Frontier Energy Limited ("Frontier Energy") have engaged ResourcesWA Pty Ltd ("ResourcesWA") to undertake a connection capacity assessment of the Project and compare the Project and its associated infrastructure to other potential locations in the South West Interconnected System (SWIS), Western Australia's major electricity network.

Frontier Energy Limited is developing the Bristol Springs Renewable Energy Hub Project (Project) located near Waroona, 120km south of Perth. Stage One of the Project includes 120 MW of Solar PV (Stage One) and a further 120 MW dual fuel hydrogen peaking plant.

Following the recent announcement to acquire Waroona Energy (WHE.TSXV), the Project is expanded to 355 MW of shovel ready renewable energy capacity (Connection Capacity), with an expansion potential to more than 1 GW based on existing landholdings and connections in placed by the combined entity.

The assessment is focused on determining whether similar connections to the Project's can be achieved in other regions of the SWIS in the short to medium term. To undertake the assessment, multiple factors have been taken into consideration, with the evaluation based on both the current situation and the potential changes that could emerge by 2032. Factors that were accounted for within the assessment include:

- **Existing Network Infrastructure:** The ability to connect and export power is initially constrained by the capacity of the immediate connection infrastructure. This assessment focuses on lines with capacities of greater than 132kV.
- **Regional Thermal Export Capacities:** Understanding the existing thermal export capacities across regional boundaries provides insights into potential limitations for new projects in delivering energy through the regions. Major thermal network boundaries in the draft Transmission System Plan were considered.
- **Existing Generation Mix:** An assessment of the current generation mix, including renewables and thermal sources defines the potential congestion level in specific areas of the network. The introduction of a constrained network access regime, starting in October 2023, will enable new connections, although new renewable projects within the same resource zones will compete for access.
- **Planned Generation Retirements:** Considering planned retirements of existing generation capacity identifies opportunities for new projects by freeing up network capacity in the medium term.
- **Load Growth:** Understanding the expected load growth that could increase demand for regional generation and alter the flow of electrons through the network in the medium term.

The assessment is separated in three sections, covering the major regions of the SWIS including:

- North Region
- East Region and;
- South & Metropolitan Region

The analysis has focused on defining the current generation and load demands across the regions of the SWIS to define the current and medium term constraints and limitations for new generation developments.

Due to the combined scale of the Project and potential expansion, the assessment has been undertaken based on assessing the capacity for new generation developments of at least 250 MW or larger within the SWIS. Consequently, this has resulted in the analysis focusing on the 330kV and 220kV segments of the SWIS that would accommodate this scale of development.

The assessment has focused on evaluating potential capacity for large scale connections at existing substations and terminals across the 330kV and 220kV transmission network. Substations and transmission infrastructure outside of the major transmission segment of the SWIS were not considered. Figure 1 below highlights the segments of the SWIS considered within the assessment and the regions of focus.

North Region (Perth Metro to Geraldton/Kalbarri) – the northern section of this region between Geraldton and Three Springs is bi-directional across the 132kV network, however, the majority of the transfer is export based with wind generation capacity feeding into the broader network. From Three Springs south to the Metropolitan Region through the 330kV and 132kV segments of the network, the flow is primarily export based.

East Region (Perth Metro to Kalgoorlie) – the eastern segment of this Region from Merredin to Kalgoorlie is import based with virtually no generation in Kalgoorlie. However, from Merredin to the Metropolitan Region, the flow is predominately export based into the Metropolitan Region whilst between Merredin and Collie it is bi-directional.

South and Metropolitan Region (Perth Metro to Albany including Metro) – this region is dominated by the presence of coal generation in Collie. With the absence of any large scale network generation south of Collie, and smaller generation north of Collie, the flow is export based across the Region.

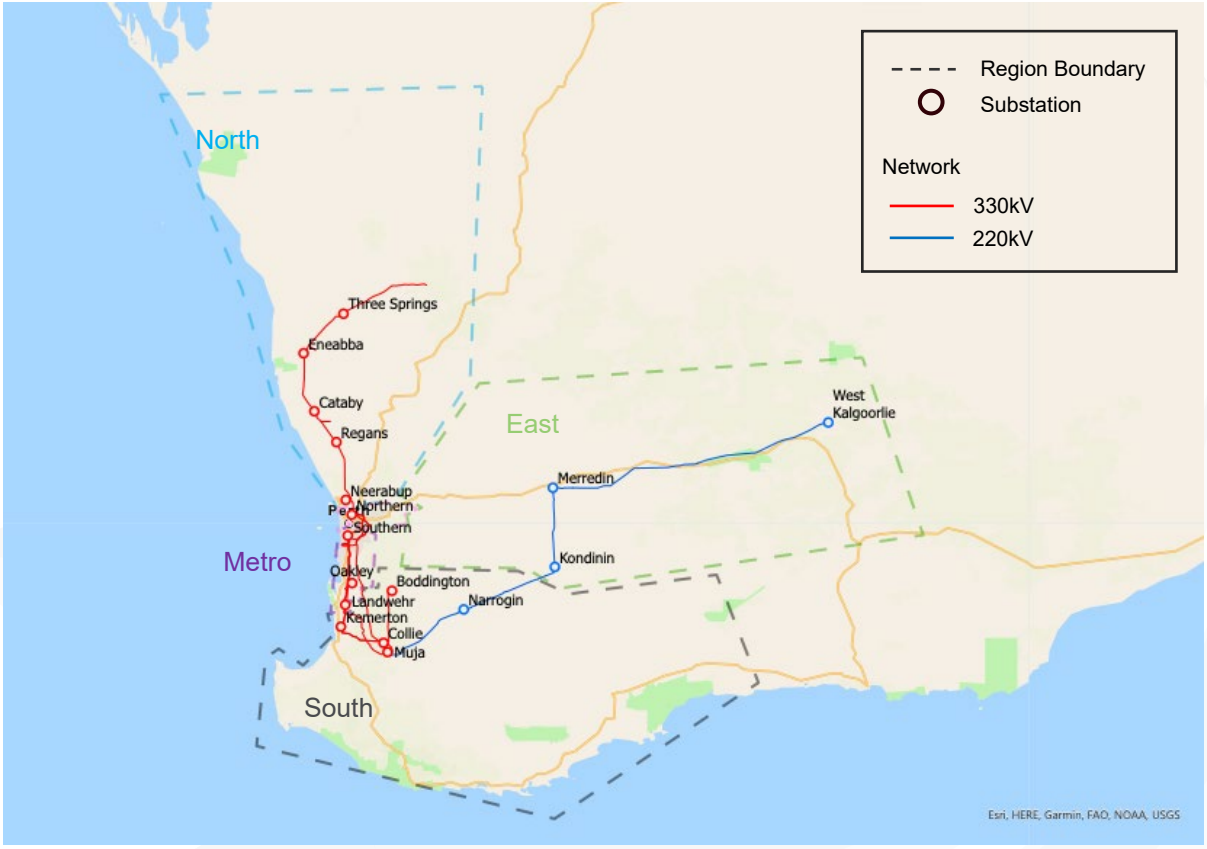

Figure 1 SWIS 330kV – 220kV network and Regions

Changing Network and Market Dynamic

In May 2023, the Western Australia Government released the SWIS Demand Assessment 2023-2042, referred to as SWISDA, providing an outline of the potential change in electricity demand and network requirements within the SWIS over the next 20 years. As part of the SWISDA, current constraints and short, medium and long term augmentations were identified that are required to enable new generation and load connections. The SWISDA highlighted that all regions within the SWIS are constrained and require augmentation to enable large scale generation. The planned upgrades identified as part of the SWISDA between 2023-2027 (orange line upgrade), 2027-2034 (green line upgrade) and 2034-2042 (purple line upgrade) are outlined below.

Figure 2 Expected network augmentation 2023 to 2042[1]

With the introduction of the constrained network access regime, starting in October 2023, connection to the SWIS for renewable and non-renewable generation will be enhanced. Although the constrained network access regime will enable connections to occur, the ability to inject electrons will be limited by the current constraints identified and outlined in this assessment. Whilst proponents will be able to invest in new substation infrastructure, the thermal line and flow constraints across the 220kV and 330kV transmission networks will remain as identified in the analysis without the substantial transmission upgrades identified within the SWISDA.

[1] Government of Western Australia, SWIS Demand Assessment 2023 to 2042

Assessment Outcome

The North Region is currently heavily constrained due to existing generation that limits further generation north of the Three Springs Terminal (MW icon in Figure 2) as well as south to the Perth Metro border. Consequently, there are plans to increase the capacity to approximately 500 MW within the SWISDA between 2027 and 2034, however, there is limited potential for large scale connection in the short to medium term between Neerabup (NB) and Geraldton (NC).

The East Region is dependent on the 220kV transmission line that is constrained by existing generation near Merredin consisting of gas, utility scale Solar PV and wind generation. This limits any generation in the East Region at present with new generation only capable of serving loads within the Kalgoorlie area within the 132kV network.

The South Region, including the Metro region, is heavily impacted by the coal generation facilities in Collie and large loads associated with the Kwinana industrial Area and Alumina processing near Wagerup and Pinjarra. However, the boundary between the Metro and South Region currently has a surplus in transfer capacity of between 500 to 700 MW along the 330kV network between Collie and the Metro Region. This results in capacity along the 330kV network, with the Landwehr and Kwinana Industrial terminals presenting the largest existing connection opportunities.

With the WA State Government's strategy to retire Collie and Muja coal generation by 2030, a significant capacity of approximately 1,200 MW will emerge post 2030 for utility scale generation in the Collie area. However, land access in this region is expected to limit the potential for large scale generation due to existing environmental and agricultural constraints.

The findings of this assessment showed there are no other opportunities that exist on the SWIS for the development of a connected generator to the scale of the Bristol Springs Renewable Energy Hub Project in the short or medium term.

Factor	Assessment Conclusions
Transmission Network Access	Only the 330kV network is capable of accommodating a connection to the scale of the Project with augmentation of the 220kV network not expected until at least 2034
New access investment	Developments greater than 250 MW may invest in new substations and terminals. However, curtailment constraints on the associated 330kV network will continue until post 2030 due to existing thermal constraints.
Selected substations capable	Only Kemerton, Oakley, Landwehr, Eneabba and Three Springs Terminals could accommodate the scale of generation of the Project within the 330kV network.
North Region Substation limitations	Eneabba and Three Springs Terminals are substantially constrained in the near term due to significant existing generation limiting the injection into the Northern Region of the SWIS
South Region Substation limitations	Oakley and Kemerton Terminal have substantial industrial loads and land constraints which physically limit the generator connection capacity.

2 NORTH REGION

The North Region, extends from Neerabup Terminal to Kalbarri and is separated into 2 parts. The southern segment of this region, from Neerabup to Three Springs, consists of a 330kV transmission line as well as a 132kV transmission line, whilst the network from Three Springs to Geraldton consists of a dual 132kV network. A detailed overview of the region is presented in Figure 3 on the following page.

Generation in the region consists of wind generation south of Geraldton and wind generation in the southern portion of the North Region. Major substations/terminals include the Neerabup, Cataby, Three Springs and Mungarra Terminal near Geraldton

2.1 Current Outlook

The assessment undertaken of the North Region identified that the region is currently heavily constrained by export capacity limitations. Key issues within this region include:

- Existing renewable generation energy capacity of 840 MW, predominately in the northern segment of this region
- 880 MW of thermal generation across the southern segment of this region
- Excess of generation in this region has resulted in thermal constraints/limitations across the 330kV network.

Within the North Region, the network between Geraldton and Three Springs has been identified as a critical limitation. The current dual 132kV transmission has a limited capacity of less than 80 MW due to the substantial wind generation capacity already in operations in this segment of the North Region that imposes thermal constraints. Capacity within the primary connection terminal at Mungarra (near Geraldton) and Three Springs is consequently limited due to the existing constraints. The southern segment part of the region has some capacity within the 330kV transmission network between Three Springs and Neerabup based on the time of day thermal loading. However, the smaller terminals at Cataby and Regans are constrained due to existing wind generation connections at these two locations.

2.2 Medium – Long Term Outlook

Within the SWISDA planning, it is anticipated that an additional 1.8 GW of regional demand will emerge in the North Region by 2034, primarily driven by prospective hydrogen developments. Planned network upgrades between the Mungarra Terminal and Three Springs Terminal between 2027 and 2034 (see Figure 1) in response to this potential demand will increase overall capacity as well as transfer capacity in the northern segment of the region. This will deliver greater capacity at Mungarra and Three Springs Terminals by 2034. Upgrades to the southern segment of the North Region will further increase capacity and result in approximately 500 MW of additional transfer capacity between the North Region and Metro Region.

2.3 Summary of North Region

As of September 2023, the outlook for establishing new generation and exporting energy to the Western Power network is limited. The following conclusions were determined with respect to the North Region:

- New developments and connections attached to substations in the northern segment of the region, Geraldton, Mungarra and Three Springs, would be limited to less than 80 MW and more likely to be less than 50 MW.
- Geraldton based connections will be limited prior to planned upgrades of the Geraldton Terminal between 2034 and 2042
- Developments at Cataby and Regans in the southern segment of the region are thermally constrained and limited without planned network upgrades.
- Overall, a 100 MW or greater connection is not possible at this stage without network upgrades, with any new development to have export curtailment imposed due to network constraints.

Upgrades of the North Region network have been identified based on the proposed hydrogen developments identified as part of the SWISDA. Changes in the execution of these hydrogen projects would place at risk some of the planned upgrades of the North Region and upgrades are not certain.

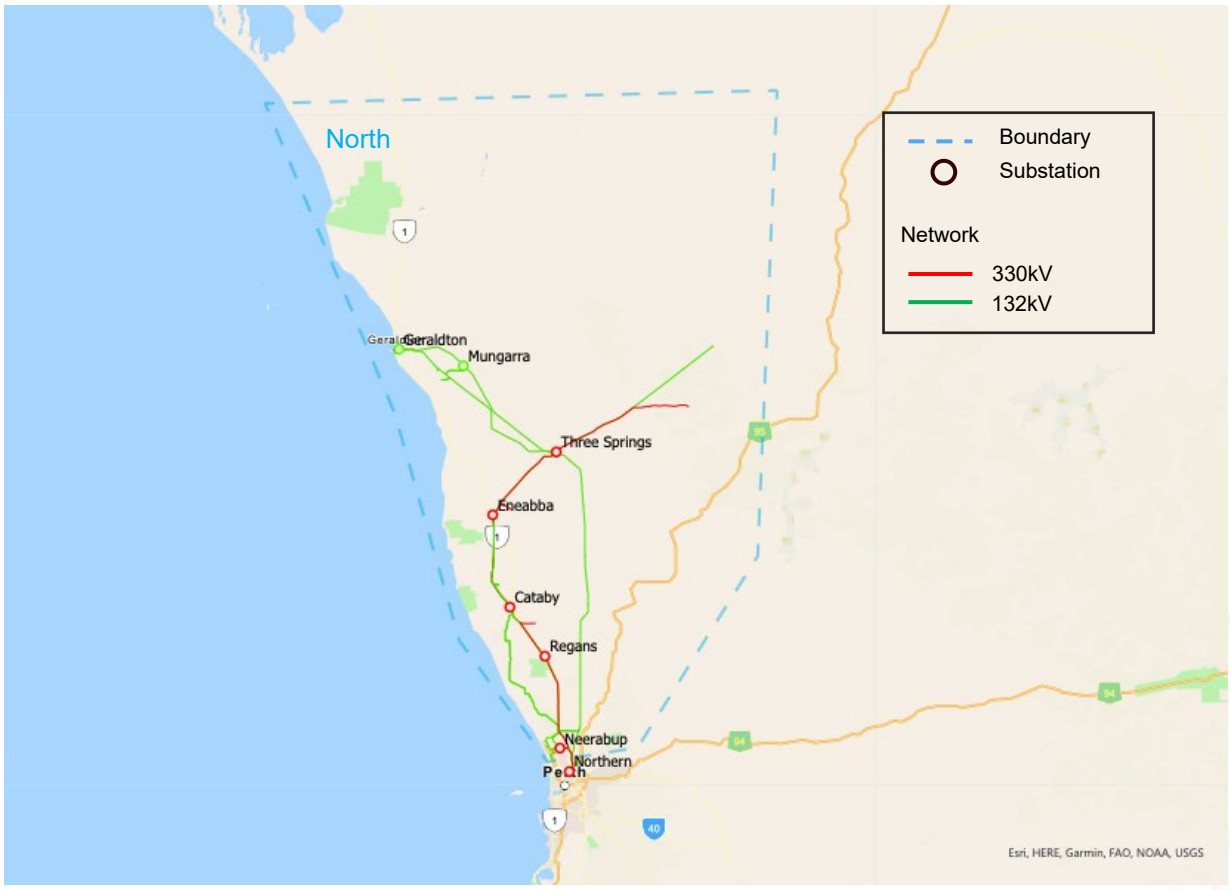

Figure 3 North Region 330 and 132kV network

3 EAST REGION

The East Region covers area from Northam and Narrogin through to Kalgoorlie and is primarily supported through a single 220kV transmission line. Generation in the region is limited to large scale solar and wind generation as well as peaking gas generation in Merredin with limited generation in other parts of the region.

Major terminals that would enable connection include the Merredin and West Kalgoorlie Terminals, with a majority of the load predominately located near Kalgoorlie. Generation at Merredin predominately supports loads across the broader SWIS network.

3.1 Current Outlook

The East Region is comprised of two primary zones, with a generation zone near Merredin and a load centre near Kalgoorlie. Notably, the generation zone at Merredin is predominantly focused on interconnection with the Metropolitan and South Regions to provide capacity into the broader network (refer to Figure 3).

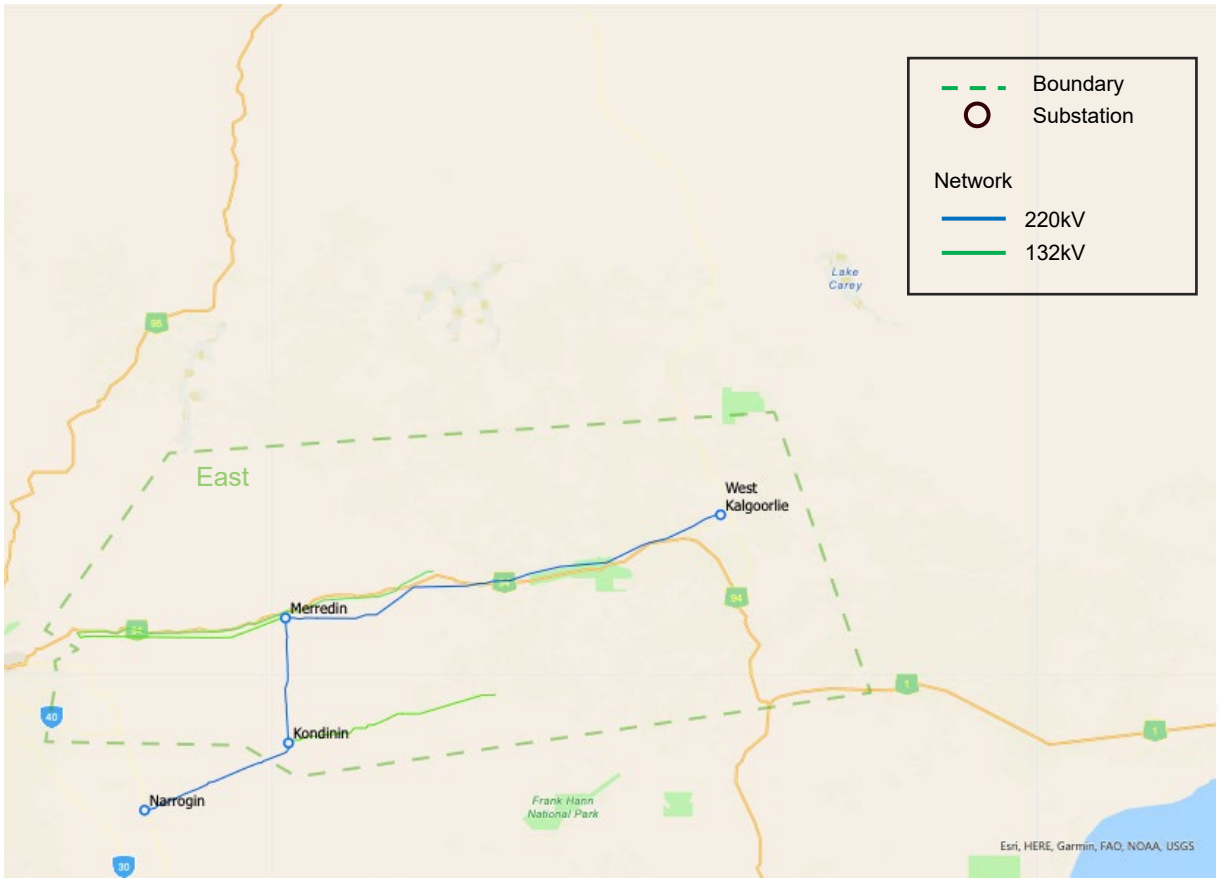

Figure 4 Eastern Region View

The East Region consists of the following key components:

- 354 MW of renewable generation capacity, situated near Merredin
- 335 MW of thermal (gas) generation situated near Merredin that is privately contracted or utilised for network control purposes.
- 230 MW of planned wind generation near Kondinin and 150 MW of wind generation
- 120 MW of load attached to the West Kalgoorlie Terminal

The substations surrounding Merredin operate as net energy export locations and are close to capacity through the existing renewable and non-renewable generation connections. Stability constraints within the network currently presents a greater limitation than the thermal constraints within the 220kV network with the export capacity of the East Region set at 230 MW Curtailment measures are currently applied to the Collgar Wind Farm at Merredin due to the thermal constraints on the 220kV network, the curtailment applied to maintain network stability.

The West Kalgoorlie Terminal operates as a load terminal with approximately 120 MW of load in the Kalgoorlie region. Limited capacity for transfer exists through the West Kalgoorlie terminal, however, some capacity exists within the 132kV transmission ring that surrounds Kalgoorlie. However, the connection into the 132kV ring is limited with up to 50 MW of generation possible within the current arrangements of the 132kV ring.

3.2 Medium – Long Term Outlook

The SWISDA anticipates a further 400 MW of load expansion in the Eastern Goldfields, which will enhance the overall energy generation potential, mostly located around Kalgoorlie. As a result, upgrades along the 220kV network from Collie to West Kalgoorlie have been identified between 2027 to 2034 to alleviate network constraints and reduce current curtailment on the existing renewable

generation facilities. Upgrades to the 220kV network would provide additional capacity at the substations surrounding Merredin and at West Kalgoorlie but no detailed planning of the sequence of upgrades to these terminals has been undertaken. It is unlikely that the upgrades will add significant capacity to Merredin and West Kalgoorlie Terminals, with large capacity increases dependent on upgrading the 220kV line to 330kV.

3.3 Summary of East Region

The East Region's renewable and non-renewable generation capacity results in the western section of the East Region and its substations largely functioning as a net exporter. In contrast, the eastern section of the East Region and the West Kalgoorlie Terminal is primarily a net energy importer..

Stability constraints within the network are likely to arise before thermal constraints within the 220kV network with the East Region export capacity currently set at 230 MW. These stability concerns will be exacerbated by pre-existing constraints in the Merredin region, leading to renewable generation primarily serving regional power demands. Opportunities exist for some network connected renewable generation within the Kalgoorlie 132kV ring but this will be limited to the capacity of the 132kV and is likely to be limited to less than 50 MW.

New generation in the East Region is extremely limited at both Merredin and West Kalgoorlie with the following conclusions from the assessment:

- New developments at Merredin are not possible at this stage with the Collgar Wind Farm already curtailed.
- Stability constraints on the 220kV network prevent new generation east of Merredin to West Kalgoorlie.
- Some capacity currently exists for new generation at Kondinin, however, new wind generation being implemented at this substation will absorb that capacity with any additional generation heavily curtailed
- The connection could be achieved within the 132kV ring surrounding Kalgoorlie, limited to less than 50 MW.

Overall, this region is not the most favourable location for large-scale renewable generation due to limitations in transmission capacities and the large distances between generation and load centres in this part of the network.

4 SOUTH & METRO REGIONS

The South Region spans from the Perth Metro region south to Kemerton and across to Collie, with a dual 132kV line from Collie to Manjimup and Albany. The South Region has the largest extent of the 330kV network with multiple lines from Collie extending to Boddington, and via Worsley, Kemerton and Pinjarra connecting to the Metro Region.

Major terminals within the 330kV network include the Landwehr and Kemerton Terminals south of Perth, Narrogin on the boundary to the East Region, along with industrial terminals at Pinjarra (Alcoa), Boddington (Newmont Mining) and Kwinana. There are also coal generation terminals located at Bluewater and Muja.

The South Region has considerable existing capacity within the 330kV network that will further expand over the next decade with the retirement of the Collie coal-fired power stations.

The Metro Region was assessed as being unsuitable for the development of large scale renewable generation due to the limitation of land availability. The consideration of the Metro Region was limited to the interface with the surrounding North, Weast and South Regions within this assessment.

Figure 5 South Region View

4.1 Current Outlook

The 330kV network throughout the South Region supports a combination of generation (predominately coal-fired generation near Collie) and industrial loads south of Perth. This has resulted in the creation of multiple 330kV transmission segments within the South Region that enables considerable capacity to exist within the 330kV network.

The existing thermal generation capacity within the South Region is 1600 MW, with the majority of this capacity (1300MW) attributed to the Muja, Collie and Bluewaters coal-fired generation facilities in Collie. Additionally, another 1300 MW of gas generation infrastructure is located in the South and Metro Regions. There is limited large-scale grid-tied renewables in operation at this point with less than 40MW of wind generation, primarily located near Albany.

Connection capacity at substations and terminals within the South Region is varied due to the existing generation and industrial loads. Key components of the South Region include:

- Large generation terminals of Bluewaters, Collie and Muja are expected to become available following the retirement of coal-fired generation from around 2030.
- The development of generation adjacent to Collie, Bluewaters and Muja will be limited by land availability with State Forest surrounding the existing coal mining areas.
- Industrial load terminals at Pinjarra (Oakley) and Boddington have some available capacity, however, are dedicated to the industrial operators (Alcoa and Newmont) and are similarly constrained by land access.
- The Kwinana Industrial Area terminal has an available capacity of nearly 1200MW but is substantially land locked by surrounding industrial sites that prevents any large scale renewable generation.
- The Narrogin terminal has limited capacity due to existing DSOC generation connections for new wind generation projects near Narrogin.

Overall, the South Region has considerable capacity within the 330kV network but limited capacity within the substation and terminals connected to the 330kV network (and 220kV network in regards to Narrogin). The exception to this is the Kemerton and Landwehr Terminals which both present current available capacity.

The Kemerton location is a dedicated industrial precinct with land surrounding the terminal already developed for large scale industrial facilities or schedule to be developed. The usage of available capacity for a generation connection at Kemerton could limit the available capacity for future industrial developments in the area and would likely be opposed by the Western Australian planning authority, DevelopmentWA.

4.2 Medium – Long Term Outlook

Due to the WA State Government's decarbonisation strategy, the existing coal facilities are scheduled for retirement in 2030 and will release substantial transfer capacity within the region, enabling the establishment of extensive generation initiatives and significant storage projects. Improvements in the South Region 330kV network are not scheduled until between 2034 to 2042 given the existing capacity and coal-fired generation retirement.

SWISDA's forecasts indicate an anticipated additional demand of 6GW in the South Region to 2042. This will require the increase in some of the 330kV network to support this load expected to focus on the Kwinana and Bunbury regions where industrial load increases will be focused.

4.3 Summary of South and Metro South Region

Historically, Collie has played a vital role in supplying baseload power to the SWIS and leading to substantial transfer capacity between this generation centre and the demand hubs located in the Metro Region.

Due to plans to retire the Synergy Collie Power Station (340MW) by late 2027 and Muja (854MW) by 2029, there is an opportunity for new generation loads in this region of the network. The South Region currently has a transfer capacity ranging between 500-700 MW. This segment of the network is particularly well-suited for the implementation of new generation projects, owing to the capacity of the 330kV transmission network.

New generation connections in the South Region will be possible based on the conclusions from the assessment, including:

- New developments from 2030 at the Bluewaters, Muja and Collie Terminals following the coal-fired retirement. However, land availability is limited which will inhibit large scale Solar PV whilst the region is unsuitable for wind generation due to the presence of endangered bird species.
- Large scale generation connections at Pinjarra (Oakley) and Boddington will be dependent on industrial loads at Alcoa and Newmont that is expected to utilise all available capacity.
- Kemerton and Kwinana are limited due to the need for protecting available capacity for industrial developments (Kemerton) or have no available land for large scale Solar PV or onshore wind generation (Kwinana)
- Landwehr presents the most available potential location for large scale generation connections, with Oakley and Kemerton possibly available depending upon surrounding industrial load requirements.

5 NEAR TERM CAPACITY SUMMARY

Across the SWIS, there is currently limited large scale network connection capacities for the development of new renewable generation facilities. The North Region is limited due to the existing thermal constraints on the 330kV and 132kV transmission networks in this region. Although smaller Solar PV facilities could be integrated in the North Region, they are likely to be curtailed and be restricted to small (sub 50MW) connections at Cataby and Regans Terminals.

The East Region does not present any opportunities for large scale network connected generation in the near term due to limitations of the 220kV transmission. Limitations on transfer capacity from Merredin west limit new generation in the middle area of the East Region, with new wind developments at Kondinin and attached to Kondinin absorbing capacity between Merredin and Collie. Large scale network connected generation around Kalgoorlie will be limited to injection capacities within the 132kV ring surrounding Kalgoorlie.

The South Region Terminals of Landwehr, Oakley, Kemerton, Muja and Bluewaters present immediate and near term opportunities for large scale network connection. Developments on the 132kV network down to Manjimup and Albany were dismissed due to both existing capacity limits and existing planning or operating large scale renewable generation.

Within the 330kV network both Oakley and Kemerton are dependent upon existing industrial loads, with Kemerton already at its upper limits due to industrial loads within the Kemerton industrial area. The Collie region, including the Muja and Bluewaters substations have substation connection and transfer capacity within the 330kV network and will present opportunities following the closure of the coal-fired power stations. However, the region is surrounded by State forest limiting land availability with the majority of cleared land currently mined for coal requiring rehabilitation post 2030.

Whilst the constrained network access regime introduction in October 2023 provides greater capacity for new connections to be integrated into the SWIS, the existing capacity limitations on the 330kV and 220kV network will be a limiting factor until major upgrades are implemented between 2025 and 2035. There is no certainty on these upgrades with industrial load users and generators expected to fund new connections that will underpin the upgrading of the transmission network.

Until 2030 only Landwehr Terminal can readily accommodate new large scale renewable connections of 250 MW or greater. It is expected that a number of Behind the Meter connections will be developed by industry whilst smaller scale renewable and large scale battery storage are expected to be developed in conjunction with existing generators at selected substations and terminals

About ResourcesWA

ResourcesWA is a specialist energy and resources consultancy that utilises a multiple lens approach to improve, certify and support various phases of development across the life cycle of a project. ResourcesWA has worked extensively with companies in the development of resource projects across Australia and Africa, bridging the gap between technical and financial aspects of project development.

ResourcesWA energy advisory team provides advice and planning to users and generators encompassing energy infrastructure solutions from traditional gas and diesel through to renewable and hybrid generation, as well as emerging storage solutions including modular pumped hydro storage, geothermal, modular solar thermal and compressed air and gas storage technologies.

ResourcesWA embeds our expertise within our clients' development and operation teams with a focus on off-grid, edge of grid, microgrids and behind the meter solutions. Our consultation has incorporated projects within the SWIS, NWIS and NEM markets alongside off grid industrial operators. Our insight is enhanced through our separate RWA Developments business that focuses on Build, Own and Operate developments for industrial customers across Australia.