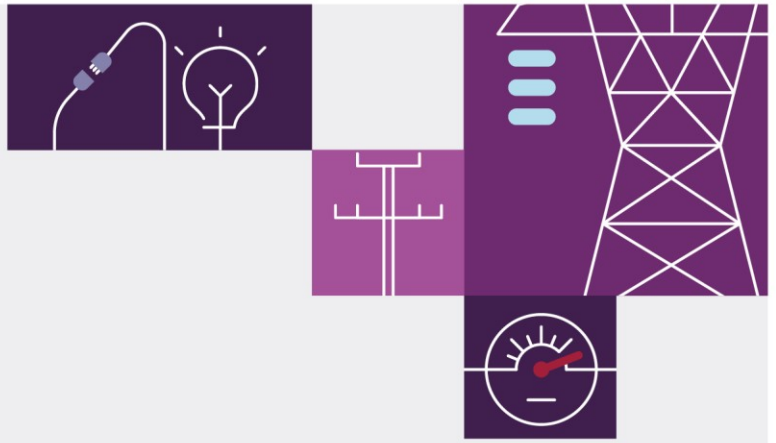


Appendix 4. Queensland

June 2024

Appendix to the 2024 Enhanced Locational
Information Report





Important notice

Purpose

This report has been published to implement the Energy Security Board (ESB) 'enhanced information' transmission access reforms. The report is intended to support more informed investment and decision-making processes in the National Electricity Market, by collating public metrics and indicators that represent important locational characteristics of the power system. This report includes only publicly available information from existing AEMO, industry, and stakeholder publications.

AEMO publishes this *Enhanced Locational Information (ELI) Report* pursuant to its functions in section 49(2)(c) of the National Electricity Law. This publication is generally based on information available to AEMO as at 30 April 2024, unless otherwise indicated.

Disclaimer

AEMO has made reasonable efforts to ensure the quality of the information in this publication but cannot guarantee that information, forecasts and assumptions are accurate, complete or appropriate for your circumstances.

Modelling work performed as part of preparing this publication inherently requires assumptions about future behaviours and market interactions, which may result in forecasts that deviate from future conditions. There will usually be differences between estimated and actual results, because events and circumstances frequently do not occur as expected, and those differences may be material.

This publication does not include all of the information that an investor, participant or potential participant in the National Electricity Market might require, and does not amount to a recommendation of any investment.

Anyone proposing to use the information in this publication (which includes information and forecasts from third parties) should independently verify its accuracy, completeness and suitability for purpose, and obtain independent and specific advice from appropriate experts.

Accordingly, to the maximum extent permitted by law, AEMO and its officers, employees and consultants involved in the preparation of this publication:

- make no representation or warranty, express or implied, as to the currency, accuracy, reliability or completeness of the information in this publication; and
- are not liable (whether by reason of negligence or otherwise) for any statements, opinions, information or other matters contained in or derived from this publication, or any omissions from it, or in respect of a person's use of the information in this publication.

Copyright

© 2024 Australian Energy Market Operator Limited. The material in this publication may be used in accordance with the [copyright permissions](#) on AEMO's website.

Version control

Version	Release date	Changes
1.0	07/06/2024	Initial release.

AEMO acknowledges the Traditional Owners of country throughout Australia and recognises their continuing connection to land, waters and culture. We pay respect to Elders past and present.



Contents

A4.1	Introduction	4
A4.2	Q1 – Far North Queensland	5
A4.3	Q2 – North Queensland Clean Energy Hub	8
A4.4	Q3 – Northern Queensland	11
A4.5	Q4 – Isaac	14
A4.6	Q5 – Barcaldine	17
A4.7	Q6 – Fitzroy	20
A4.8	Q7 – Wide Bay	23
A4.9	Q8 – Darling Downs	26
A4.10	Q9 – Banana	30
A4.11	Non-REZ	33

Figures

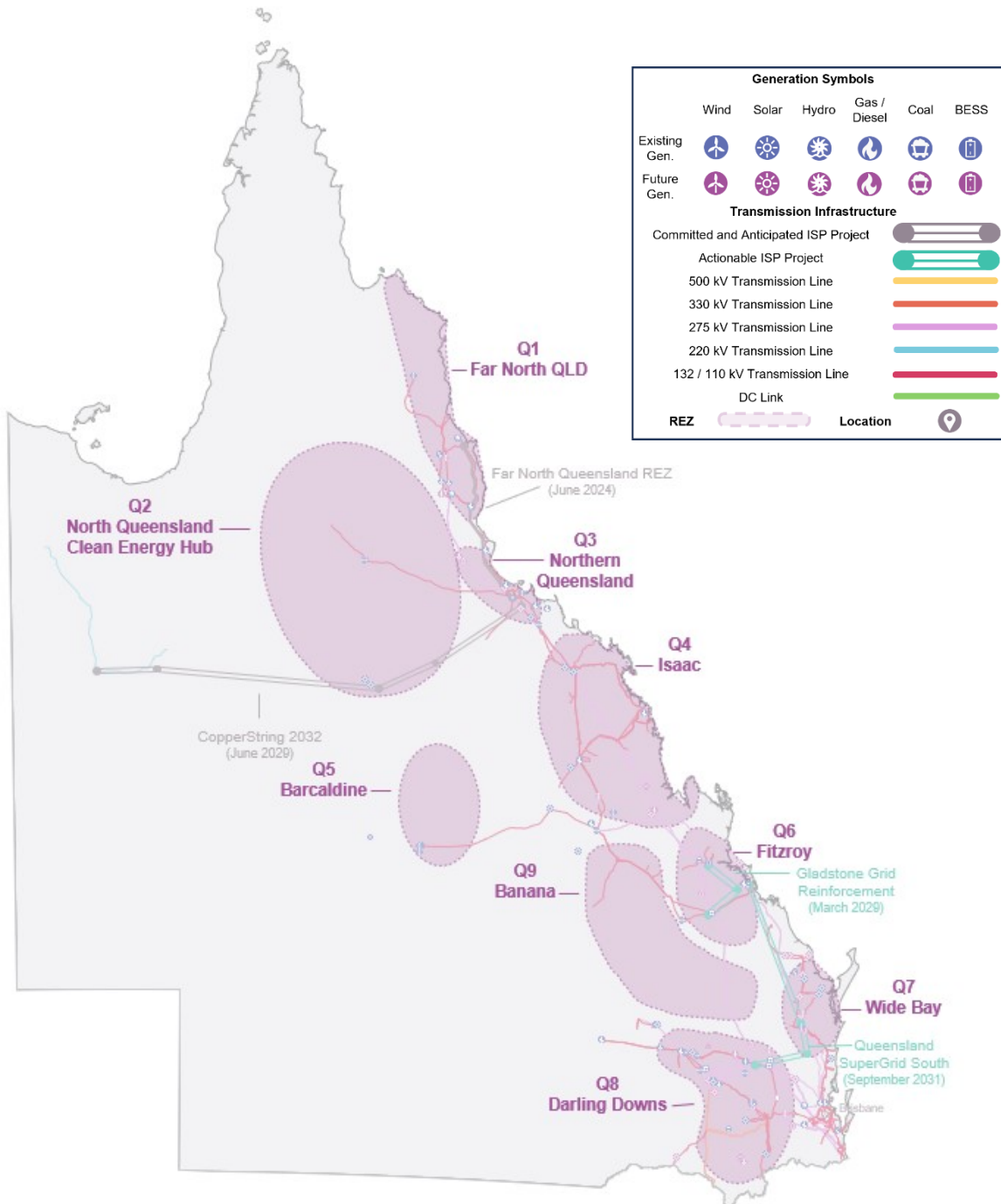
Figure 1	Overview of Queensland region and REZs	4
----------	--	---

A4.1 Introduction

This appendix provides detailed locational indicators and metrics for each REZ within Queensland. Figure 1 provides an overview map of the Queensland region and associated REZs. Appendix A2 provides a guide to interpreting the REZ scorecards presented throughout this appendix.

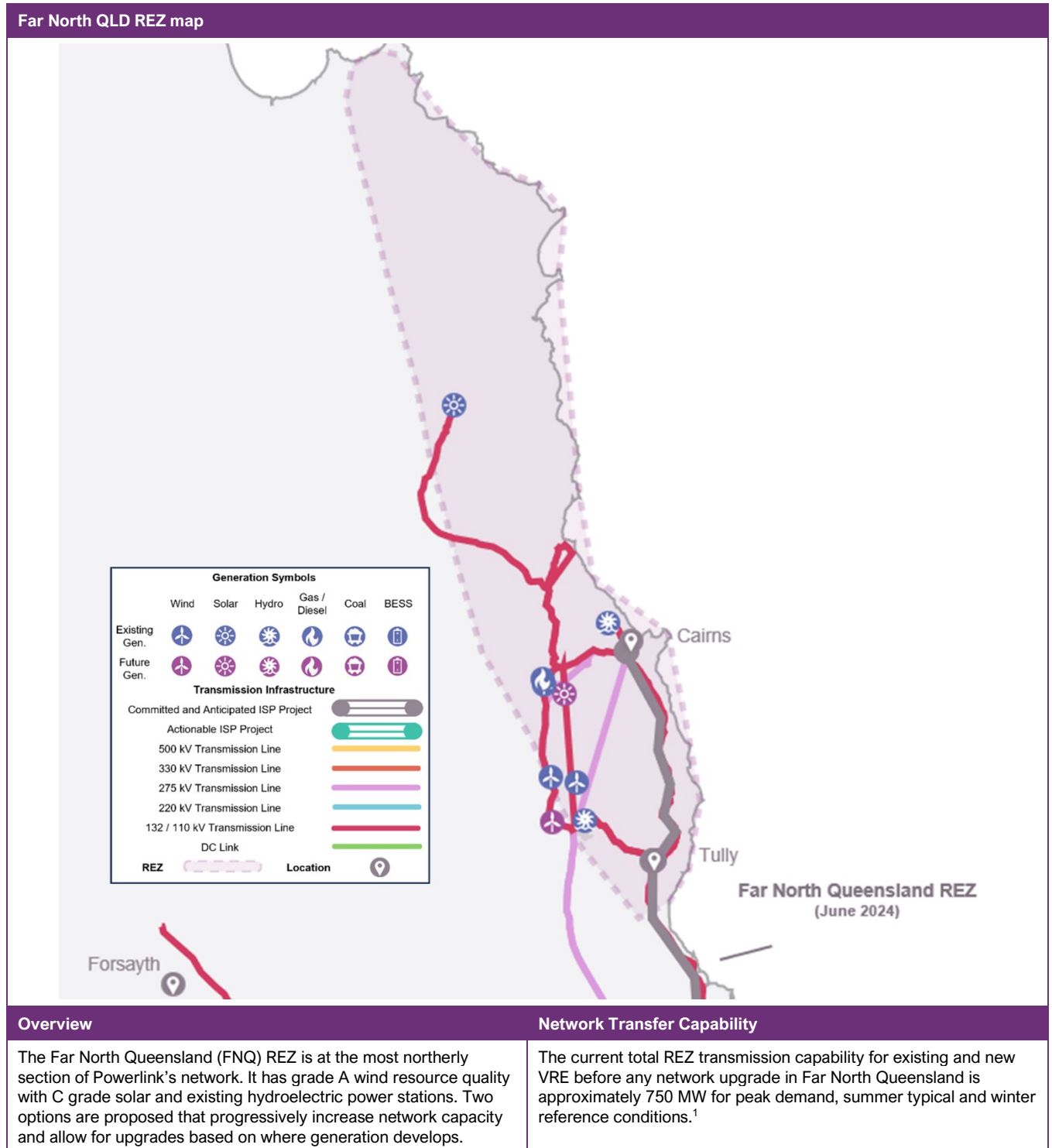
This appendix uses existing sources of publicly available information which includes the Draft 2024 ISP. Some of this information may change with the publication of the Final 2024 ISP in June 2024.

Figure 1 Overview of Queensland region and REZs



A4.2 Q1 – Far North Queensland

REZ information



¹ See ‘Build Limits’ tab of the Draft 2024 Inputs and Assumptions Workbook, at <https://aemo.com.au/-/media/files/major-publications/isp/2023/2023-iasr-assumptions-workbook.xlsx?la=en>.

Jurisdictional body	Reference	Function
Queensland Government	Queensland Energy and Jobs Plan (QEJP) ²	Overarching plan to reach targets for Queensland’s clean energy system of 50% renewable energy by 2030, 70% by 2032 and 80% by 2035. Describes Powerlink’s roles to: <ul style="list-style-type: none"> be the designated REZ Delivery Body (RDB) for transmission in QREZ regions (subject to legislation) progress early design and planning for the SuperGrid backbone transmission.
Queensland Government	Queensland SuperGrid infrastructure Blueprint ³	Outlines the optimal infrastructure pathway for the QEJP, and includes the major electricity infrastructure investments required to transform the system in line with the Queensland clean energy targets described in the QEJP. The investments outlined in this document will build Queensland’s SuperGrid.
Queensland Government	2023 Queensland REZ Roadmap ⁴	Outlines the pathway for connecting around 22 GW of new wind and solar generation.
Powerlink	Transmission Annual Planning Report ⁵	Existing Transmission Planning Function.

Generation Hosting capacity or access rights

Powerlink lists the ‘expected installed generation’ to be 500 to 700 MW following the establishment of a third 275 kV connection into Woree. This is proposed to be commissioned in April 2024⁶. This generation connecting to this REZ is also subject to the Northern Queensland – Central Queensland (NQ-CQ) network limit⁷. AEMO recommends detailed investigations to understand how this limit impacts the REZ’s hosting capacity.

Resource metrics

Resource	Solar	Wind
Resource Quality	C	A
Renewable Potential (MW)	1,100	2,280

Climate hazard

Temperature score	Bushfire score
B	A

Margin loss factors

Marginal Loss Factor		
Technology	Voltage (kV)	2024-25 MLF
Wind	275	0.9527 - 0.9605

Congestion and curtailment

Congestion information – calendar year 2023			
Constraint ID	Binding hours	Marginal value (\$)	Most affected generation
-	-	-	-

² See https://www.epw.qld.gov.au/_data/assets/pdf_file/0029/32987/queensland-energy-and-jobs-plan.pdf.

³ See https://www.epw.qld.gov.au/_data/assets/pdf_file/0030/32988/queensland-supergrid-infrastructure-blueprint.pdf.

⁴ See https://www.epw.qld.gov.au/_data/assets/pdf_file/0036/49599/REZ-roadmap.pdf.

⁵ See <https://www.powerlink.com.au/planning-report/transmission-annual-planning-report-2023>.

⁶ Table 2.1 and Table 9.3, 2023 TAPR, Powerlink, at <https://www.powerlink.com.au/sites/default/files/2023-11/2023%20Transmission%20Annual%20Planning%20Report%20-%20Whole%20Document.pdf>.

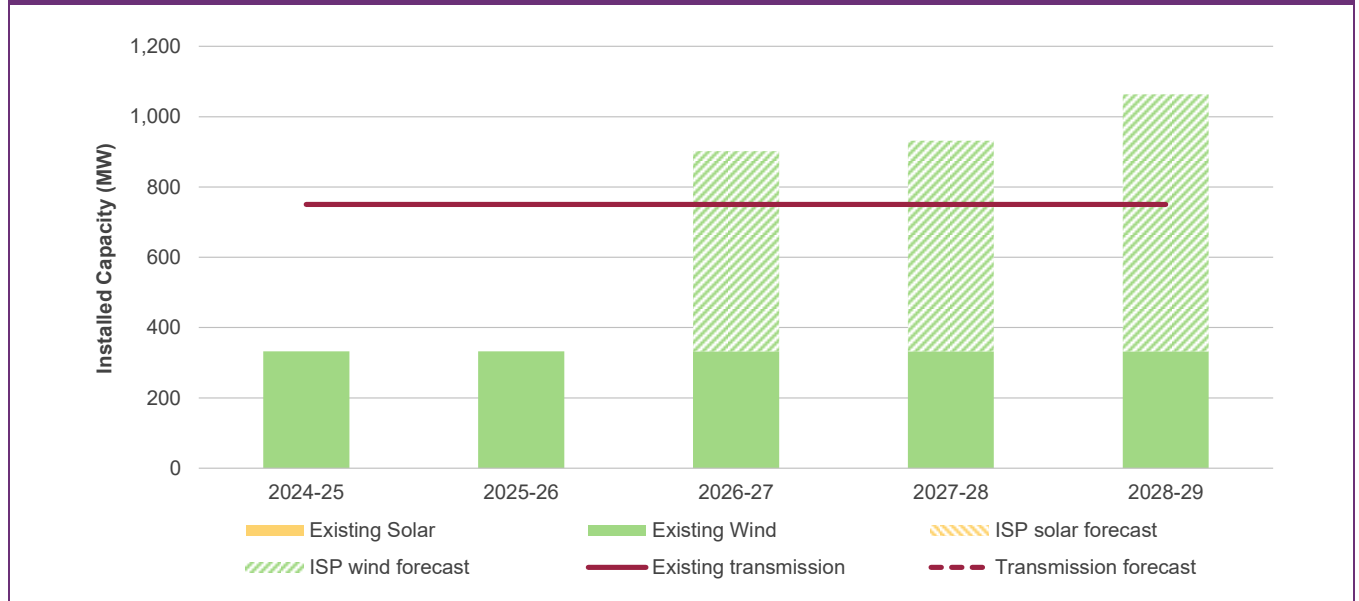
⁷ See ‘Build Limits’ tab of the Draft 2024 Inputs and Assumptions Workbook, at <https://aemo.com.au/-/media/files/major-publications/isp/2023/2023-iasr-assumptions-workbook.xlsx?la=en>.

VRE semi-scheduled curtailment – calendar year 2023						
DUID	Generator name	Maximum Capacity (MW)	Average curtailment (%)	Average curtailment (MW)	Curtailment (MWh)	
KABANWF1	Kaban Wind Farm	152	2.0	0.8	6,932	
MEWF1	Mount Emerald Wind Farm	180	1.5	0.8	7,349	
VRE curtailment – ISP forecast						
Scenario	2025		2026		2027	
	Curtailment	Economic offloading	Curtailment	Economic offloading	Curtailment	Economic offloading
Step Change	-	5%	-	1%	-	4%

ISP forecast

ISP forecast												
VRE outlook	Solar PV (MW)						Wind (MW)					
	Existing/ committed/ anticipated	Projected					Existing/ committed/ anticipated	Projected				
		2025	2026	2027	2028	2029		2025	2026	2027	2028	2029
Step Change	-	-	-	-	-	-	332	-	-	550	600	750

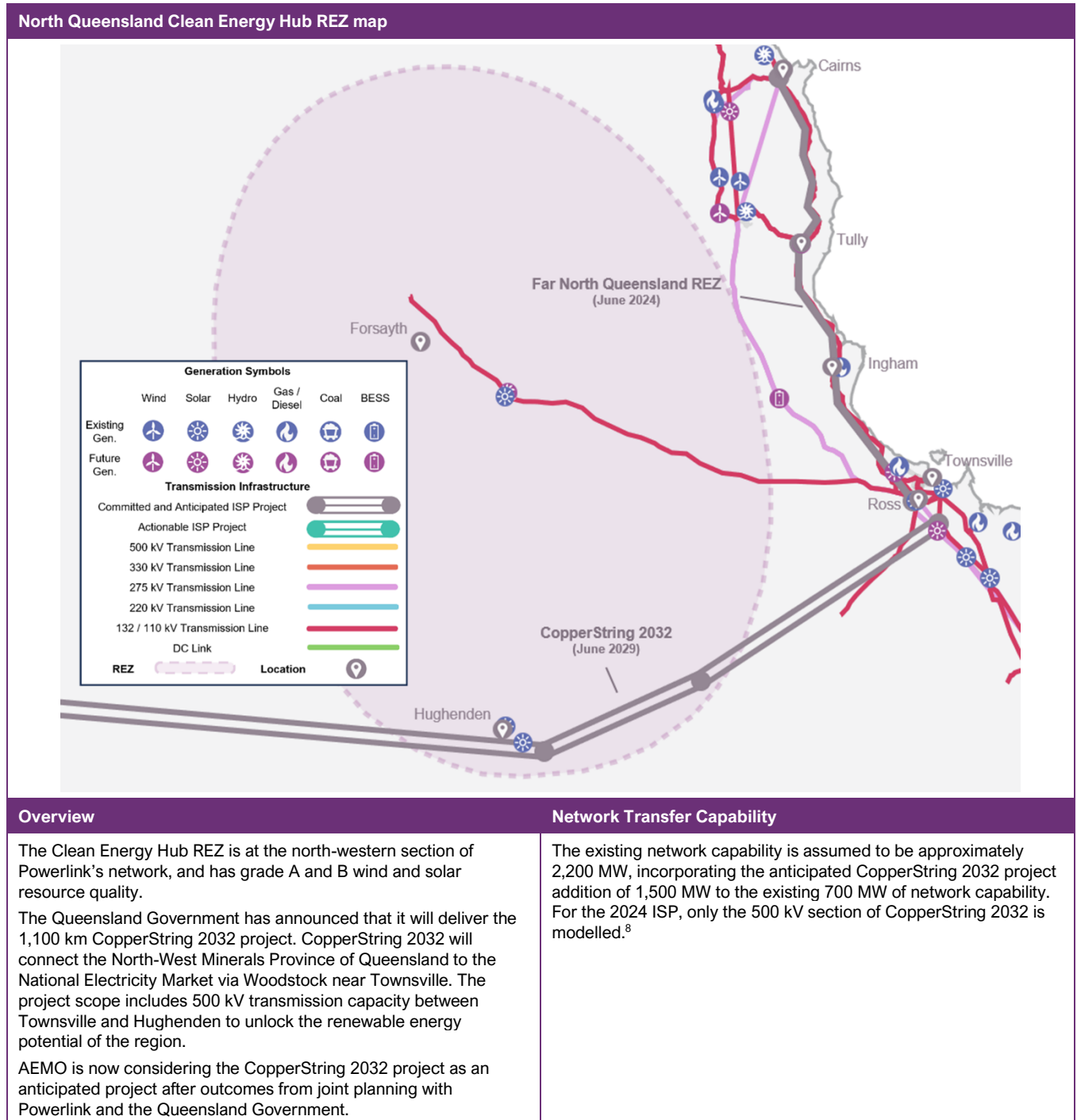
Transmission access expansion for Step Change



Committed, Anticipated, and Actionable Transmission Projects	Timing	Status	Increase in network transfer capability
-	-	-	-

A4.3 Q2 – North Queensland Clean Energy Hub

REZ information



⁸ See ‘Build Limits’ tab of the Draft 2024 Inputs and Assumptions Workbook, at <https://aemo.com.au/-/media/files/major-publications/isp/2023/2023-iasr-assumptions-workbook.xlsx?la=en>.

Jurisdictional body	Reference	Function
Queensland Government	Queensland Energy and Jobs Plan (QEJP) ⁹	<p>Overarching plan to reach targets for Queensland's clean energy system of 50% renewable energy by 2030, 70% by 2032 and 80% by 2035. Describes Powerlink's roles to:</p> <ul style="list-style-type: none"> be the Designated REZ Delivery Body (RDB) for transmission in QREZ regions (subject to legislation) progress early design and planning for the SuperGrid backbone transmission.
Queensland Government	Queensland SuperGrid infrastructure Blueprint ¹⁰	<p>Outlines the optimal infrastructure pathway for the QEJP, and includes the major electricity infrastructure investments required to transform the system in line with the Queensland clean energy targets described in the QEJP. The investments outlined in this document will build Queensland's SuperGrid.</p>
Queensland Government	2023 Queensland REZ Roadmap ¹¹	<p>Outlines the pathway for connecting around 22 GW of new wind and solar generation.</p>
Powerlink	Transmission Annual Planning Report ¹²	Existing Transmission Planning Function.

Generation Hosting capacity or access rights

There is no hosting capacity provided by the jurisdictional planning body which directly applies to this REZ. AEMO will work with the relevant parties to understand the hosting capacity for future publications.

Resource metrics

Resource	Solar	Wind
Resource Quality	A	B
Renewable Potential (MW)	8,000	18,600

Climate hazard

Temperature score	Bushfire score
D	C

Margin loss factors

Marginal Loss Factor		
Technology	Voltage (kV)	2024-25 MLF
Solar	132	0.9385 - 0.9703
Wind	132	0.9703

Congestion and curtailment

Congestion information – calendar year 2023			
Constraint ID	Binding hours	Marginal value (\$)	Most affected generation
-	-	-	-

⁹ See https://www.epw.qld.gov.au/_data/assets/pdf_file/0029/32987/queensland-energy-and-jobs-plan.pdf.

¹⁰ See https://www.epw.qld.gov.au/_data/assets/pdf_file/0030/32988/queensland-supergrid-infrastructure-blueprint.pdf.

¹¹ See https://www.epw.qld.gov.au/_data/assets/pdf_file/0036/49599/REZ-roadmap.pdf.

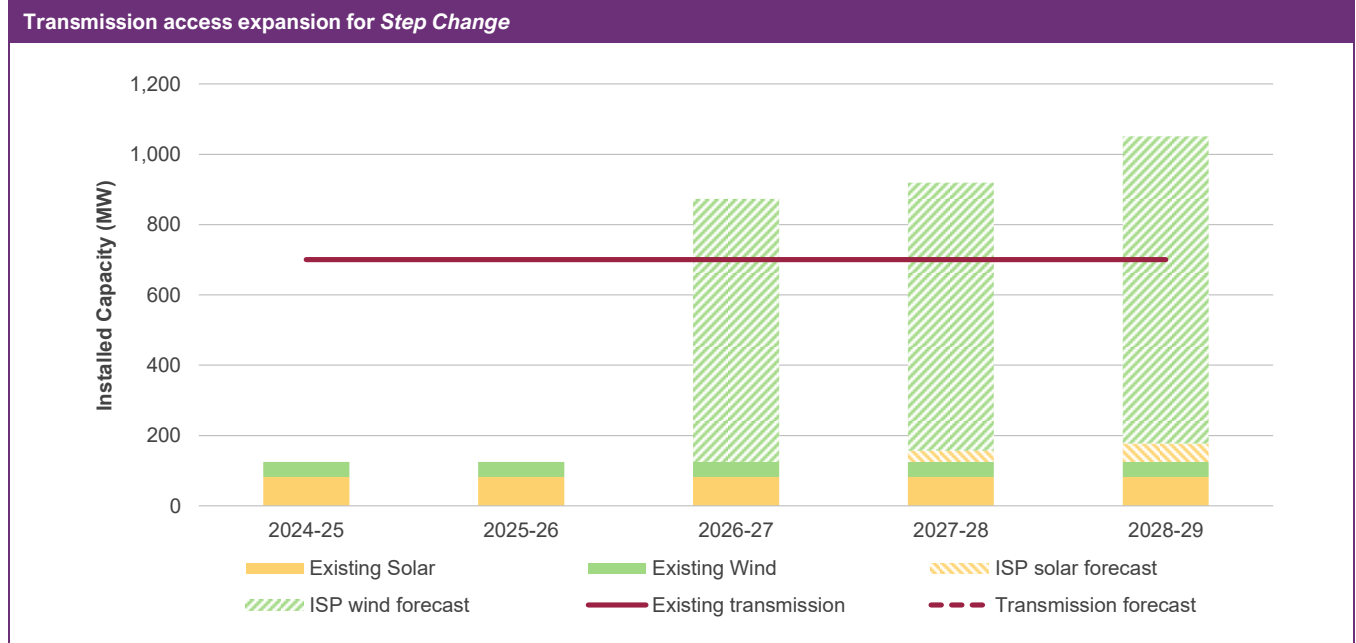
¹² See <https://www.powerlink.com.au/planning-report/transmission-annual-planning-report-2023>.

VRE semi-scheduled curtailment – calendar year 2023						
DUID	Generator name	Maximum Capacity (MW)	Average curtailment (%)	Average curtailment (MW)	Curtailment (MWh)	
KEPSF1	Kennedy Energy Park – Phase 1 – Solar	15	3.5	0.1	1,202	
KEPWF1	Kennedy Energy Park – Phase 1 – Wind	43	1.3	0.2	1,909	
KSP1	Kidston Solar Project	48	1.2	0.2	1,543	

VRE curtailment – ISP forecast						
Scenario	2025		2026		2027	
	Curtailment	Economic offloading	Curtailment	Economic offloading	Curtailment	Economic offloading
Step Change	-	2%	-	3%	-	5%

ISP forecast

ISP forecast												
VRE outlook	Solar PV (MW)						Wind (MW)					
	Existing/committed/anticipated	Projected					Existing/committed/anticipated	Projected				
		2025	2026	2027	2028	2029		2025	2026	2027	2028	2029
Step Change	82	-	-	-	50	50	43	-	-	750	750	850

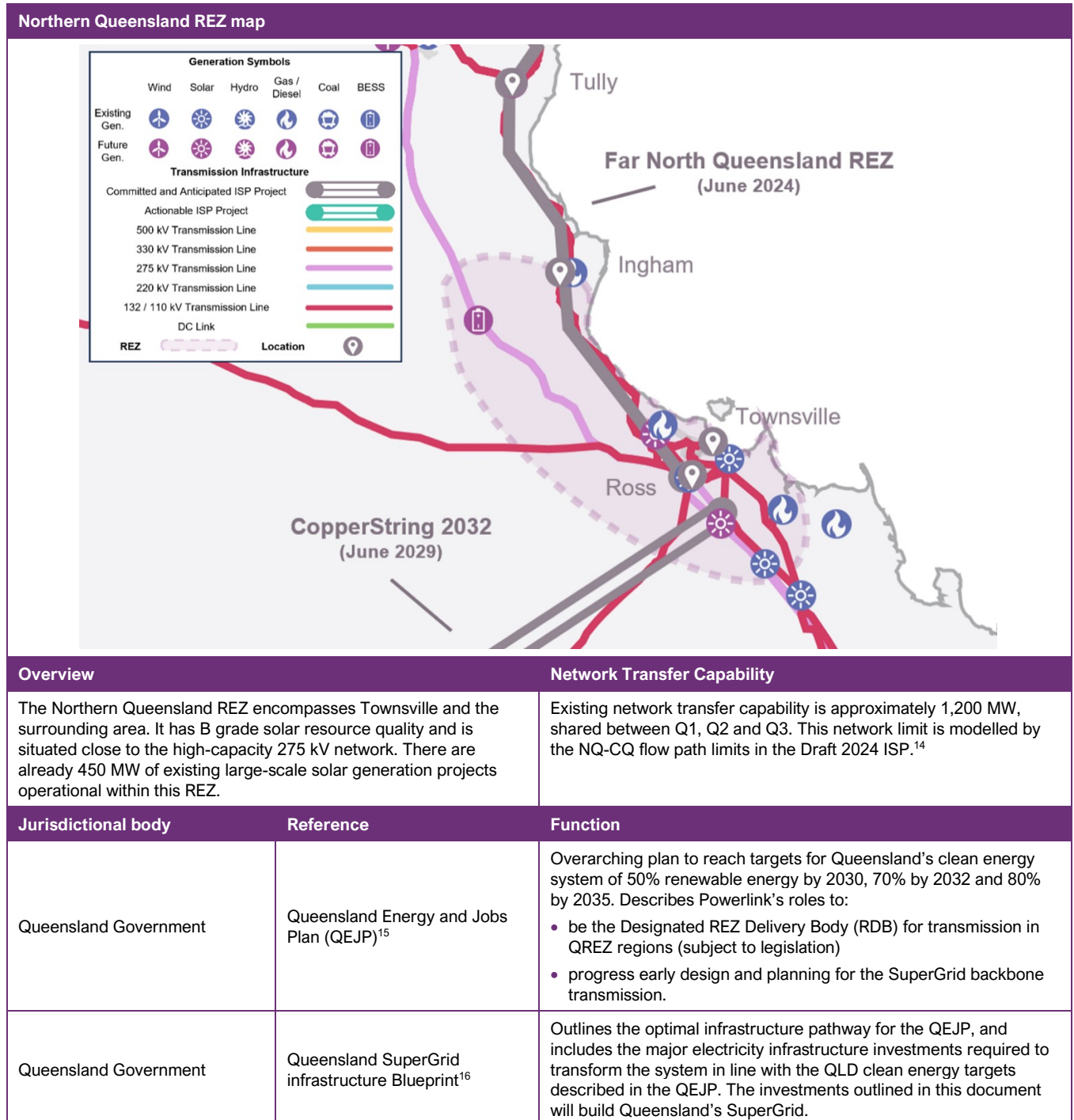


Committed, Anticipated, and Actionable Transmission Projects	Timing	Status	Increase in network transfer capability
CopperString 2032	June 2029 ¹³	Anticipated	1,500 MW

¹³ Under the Draft 2024 ISP Step Change scenario, the project is modelled in 2029-30.

A4.4 Q3 – Northern Queensland

REZ information



¹⁴ See ‘Build Limits’ tab of the Draft 2024 Inputs and Assumptions Workbook, at <https://aemo.com.au/-/media/files/major-publications/isp/2023/2023-iasr-assumptions-workbook.xlsx?la=en>.

¹⁵ See https://www.epw.qld.gov.au/_data/assets/pdf_file/0029/32987/queensland-energy-and-jobs-plan.pdf.

¹⁶ See https://www.epw.qld.gov.au/_data/assets/pdf_file/0030/32988/queensland-supergrid-infrastructure-blueprint.pdf.

Queensland Government	2023 Queensland REZ Roadmap ¹⁷	Outlines the pathway for connecting around 22 GW of new wind and solar generation.	
Powerlink	Transmission Annual Planning Report ¹⁸	Existing Transmission Planning Function.	
Generation Hosting capacity or access rights			
There is no hosting capacity provided by the jurisdictional planning body which directly applies to this REZ. AEMO will work with the relevant parties to understand the hosting capacity for future publications.			
Resource metrics			
Resource	Solar		Wind
Resource Quality	B		E
Renewable Potential (MW)	3,400		-
Climate hazard			
Temperature score	C	Bushfire score	E

Margin loss factors

Marginal Loss Factor		
Technology	Voltage (kV)	2024-25 MLF
Solar	132	0.9116 - 1.0159
	275	0.9332

Congestion and curtailment

Congestion information – calendar year 2023			
Constraint ID	Binding hours	Marginal value (\$)	Most affected generation
Q>NIL_TV66	4.0	\$59,668.0	Generation contributing to flows on 66 kV network in Townsville area

VRE semi-scheduled curtailment – calendar year 2023					
DUID	Generator name	Maximum Capacity (MW)	Average curtailment (%)	Average curtailment (MW)	Curtailment (MWh)
CLARESF1	Clare Solar Farm	100	0.7	0.2	1,631
HAUGHT11	Houghton Solar Farm Stage 1	100	1.8	0.5	4,551
RRSF1	Ross River Solar Farm	116	0.9	0.2	2,105
SMCSF1	Sun Metals Solar Farm	121	1.0	0.3	2,386

VRE curtailment – ISP forecast						
Scenario	2025		2026		2027	
	Curtailment	Economic offloading	Curtailment	Economic offloading	Curtailment	Economic offloading
Step Change	-	2%	-	1%	-	8%

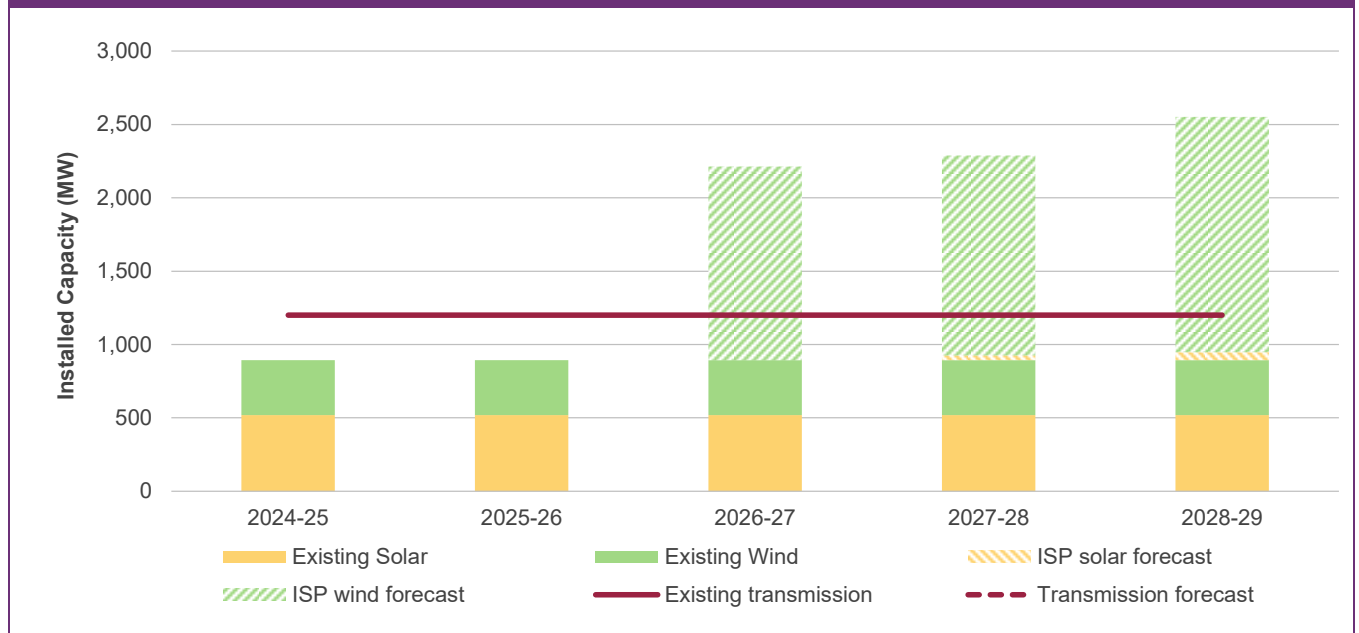
¹⁷ See https://www.epw.qld.gov.au/data/assets/pdf_file/0036/49599/REZ-roadmap.pdf.

¹⁸ See <https://www.powerlink.com.au/planning-report/transmission-annual-planning-report-2023>.

ISP forecast

ISP forecast												
VRE outlook	Solar PV (MW)					Wind (MW)						
	Existing/ committed/ anticipated	Projected					Existing/ committed/ anticipated	Projected				
		2025	2026	2027	2028	2029		2025	2026	2027	2028	2029
Step Change	437	-	-	-	-	-	-	-	-	-	-	-

Transmission access expansion for Step Change

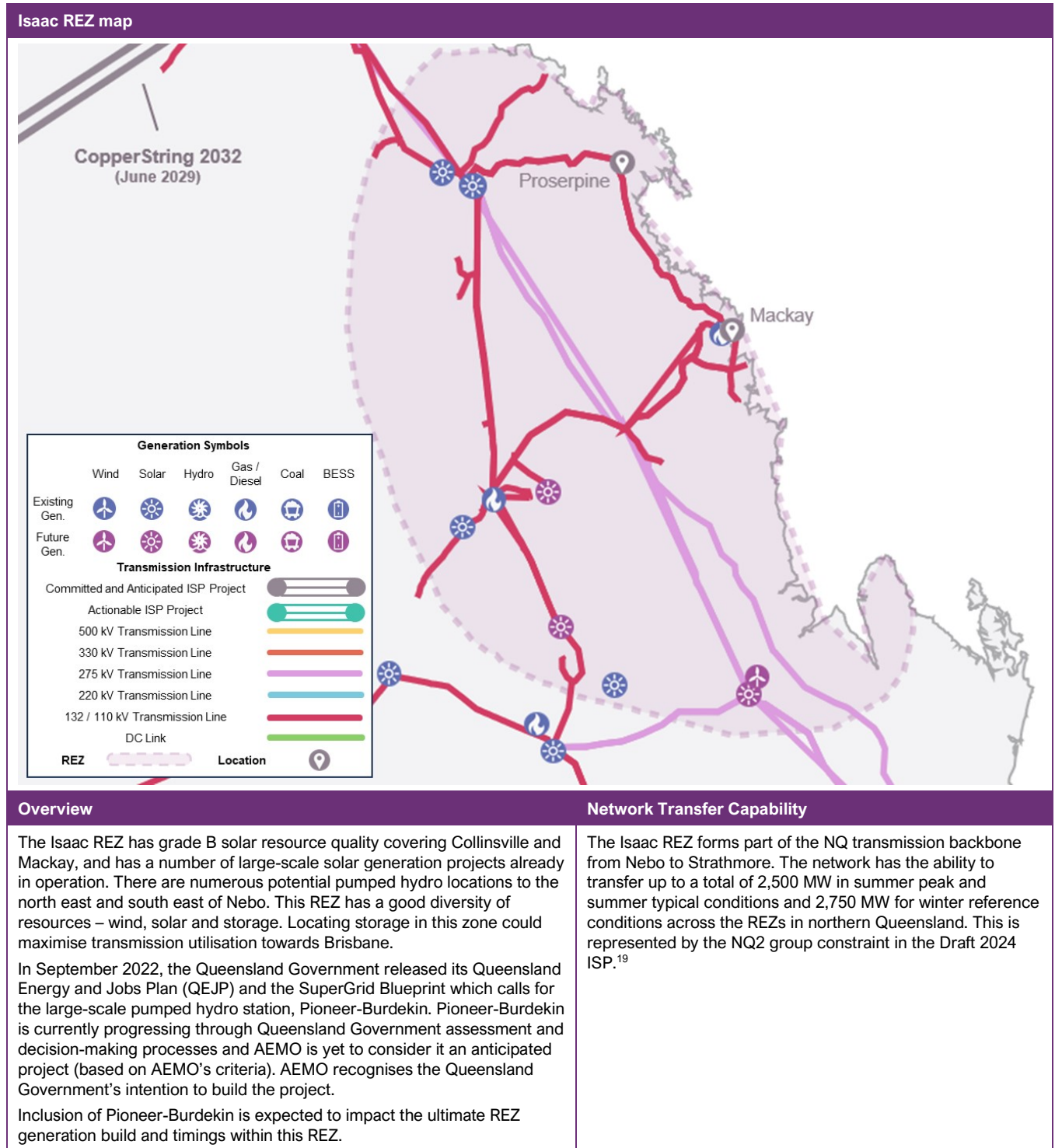


Note: The transmission limit modelled using the CQ-NQ flow path limit, and includes VRE projections for Q1, Q2 and Q3.

Committed, Anticipated, and Actionable Transmission Projects	Timing	Status	Increase in network transfer capability
-	-	-	-

A4.5 Q4 – Isaac

REZ information



¹⁹ See ‘Build Limits’ tab of the Draft 2024 Inputs and Assumptions Workbook, at <https://aemo.com.au/-/media/files/major-publications/isp/2023/2023-iasr-assumptions-workbook.xlsx?la=en>.

Jurisdictional body	Reference	Function
Queensland Government	QEJP ²⁰	Overarching plan to reach targets for Queensland’s clean energy system of 50% renewable energy by 2030, 70% by 2032 and 80% by 2035. Describes Powerlink’s roles to: <ul style="list-style-type: none"> • be the Designated REZ Delivery Body (RDB) for transmission in QREZ regions (subject to legislation) • progress early design and planning for the SuperGrid backbone transmission.
Queensland Government	Queensland SuperGrid infrastructure Blueprint ²¹	Outlines the optimal infrastructure pathway for the QEJP, and includes the major electricity infrastructure investments required to transform the system in line with the Queensland clean energy targets described in the QEJP. The investments outlined in this document will build Queensland’s SuperGrid.
Queensland Government	2023 Queensland REZ Roadmap ²²	Outlines the pathway for connecting around 22 GW of new wind and solar generation.
Powerlink	Transmission Annual Planning Report ²³	Existing Transmission Planning Function.

Generation Hosting capacity or access rights

There is no hosting capacity provided by the jurisdictional planning body which directly applies to this REZ. AEMO will work with the relevant parties to understand the hosting capacity for future publications.

Resource metrics

Resource	Solar	Wind
Resource Quality	B	D
Renewable Potential (MW)	6,900	3,800

Climate hazard			
Temperature score	C	Bushfire score	C

Margin loss factors

Marginal Loss Factor		
Technology	Voltage (kV)	2024-25 MLF
Solar	33 - 66	0.9204 - 0.9356
	132	0.9370 - 0.9397

Congestion and curtailment

Congestion information – calendar year 2023			
Constraint ID	Binding hours	Marginal value (\$)	Most affected generation
-	-	-	-

²⁰ https://www.epw.qld.gov.au/_data/assets/pdf_file/0029/32987/queensland-energy-and-jobs-plan.pdf.

²¹ https://www.epw.qld.gov.au/_data/assets/pdf_file/0030/32988/queensland-supergrid-infrastructure-blueprint.pdf.

²² https://www.epw.qld.gov.au/_data/assets/pdf_file/0036/49599/REZ-roadmap.pdf.

²³ See <https://www.powerlink.com.au/planning-report/transmission-annual-planning-report-2023>.

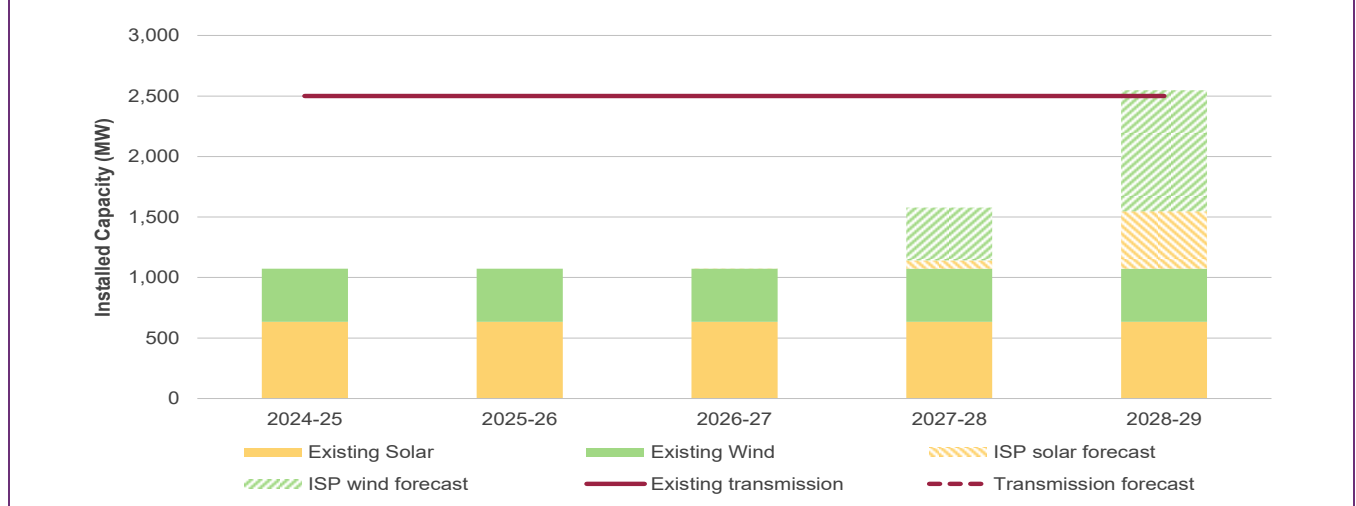
VRE semi-scheduled curtailment – calendar year 2023					
DUID	Generator name	Maximum Capacity (MW)	Average curtailment (%)	Average curtailment (MW)	Curtailment (MWh)
CLERMSF1	Clermont Solar Farm	75	2.9	0.6	4,899
CSPVPS1	Collinsville Solar PV Power Station	42	1.1	0.1	1,045
DAYDSF1	Daydream Solar Farm	150	1.7	0.6	5,617
HAMISF1	Hamilton Solar Farm	56	0.9	0.1	1,021
HAYMSF1	Hayman Solar Farm	50	2.1	0.2	2,180
LILYSF1	Lilyvale Solar Farm	100	0.5	0.1	1,069
MIDDLESF1	Middlemount Solar Farm	26	0.6	0.0	400
RUGBYR1	Rugby Run Solar Farm	65	0.7	0.1	1,201
WHITSF1	Whitsunday Solar Farm	56	1.0	0.1	1,164

VRE curtailment – ISP forecast						
Scenario	2025		2026		2027	
	Curtailment	Economic offloading	Curtailment	Economic offloading	Curtailment	Economic offloading
Step Change	-	2%	-	1%	-	5%

ISP forecast

ISP forecast												
VRE outlook	Solar PV (MW)						Wind (MW)					
	Existing/committed/anticipated	Projected					Existing/committed/anticipated	Projected				
		2025	2026	2027	2028	2029		2025	2026	2027	2028	2029
Step Change	620	-	-	-	-	400	439	-	-	-	450	1,000

Transmission access expansion for Step Change

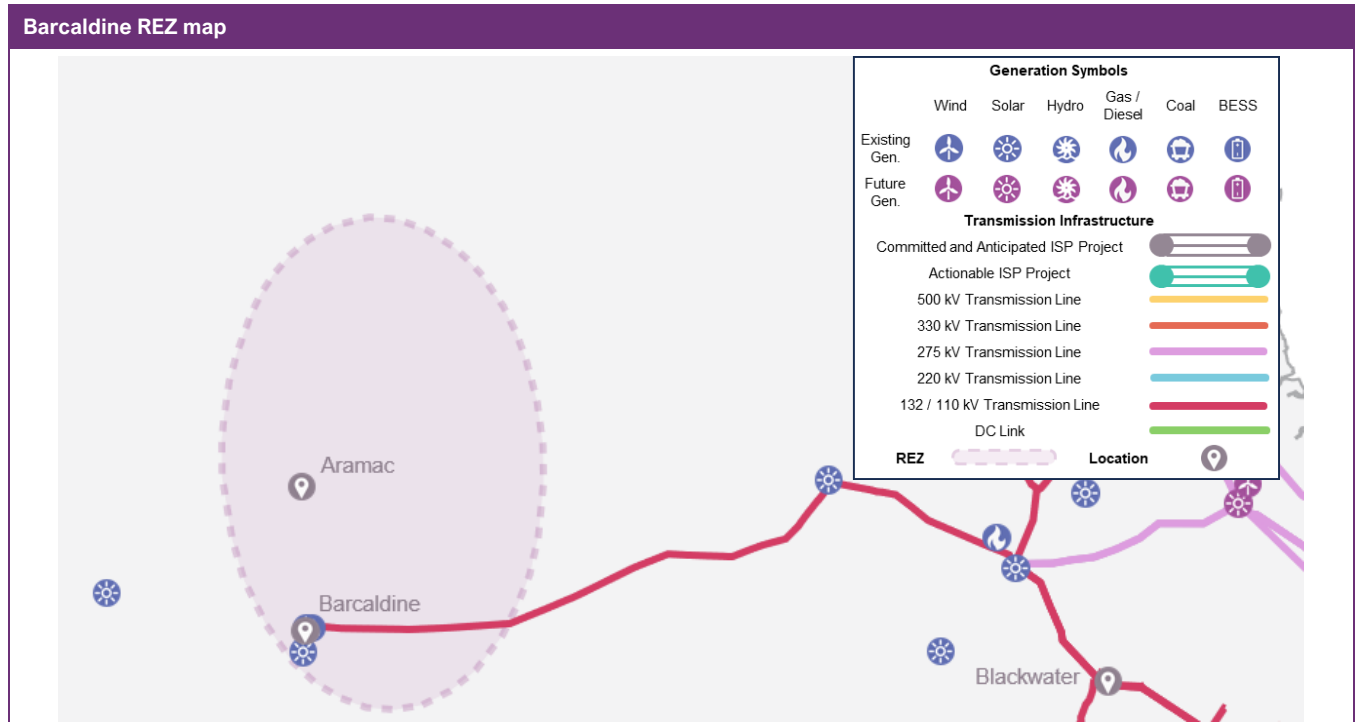


Note: The transmission access expansion forecasts show the results for NQ2 group constraint augmentation, which includes VRE projections for Q4 and Q5.

Committed, Anticipated, and Actionable Transmission Projects	Timing	Status	Increase in network transfer capability
-	-	-	-

A4.6 Q5 – Barcaldine

REZ information



Overview		Network Transfer Capability
This REZ has grade A solar resource quality but is remote from the Queensland transmission backbone.		The present network transfer capability is approximately 85 MW. ²⁴
Jurisdictional body	Reference	Function
Queensland Government	Queensland Energy and Jobs Plan (QEJP) ²⁵	Overarching plan to reach targets for Queensland’s clean energy system of 50% renewable energy by 2030, 70% by 2032 and 80% by 2035. Describes Powerlink’s roles to: <ul style="list-style-type: none"> be the Designated REZ Delivery Body (RDB) for transmission in QREZ regions (subject to legislation) progress early design and planning for the SuperGrid backbone transmission.
Queensland Government	Queensland SuperGrid infrastructure Blueprint ²⁶	Outlines the optimal infrastructure pathway for the Queensland Energy and Jobs Plan, and includes the major electricity infrastructure investments required to transform the system in line with the Queensland clean energy targets described in the QEJP. The investments outlined in this document will build Queensland’s SuperGrid.
Queensland Government	2023 Queensland REZ Roadmap ²⁷	Outlines the pathway for connecting around 22 GW of new wind and solar generation.
Powerlink	Transmission Annual Planning Report ²⁸	Existing Transmission Planning Function.

²⁴ See ‘Build Limits’ tab of the Draft 2024 Inputs and Assumptions Workbook, at <https://aemo.com.au/-/media/files/major-publications/isp/2023/2023-iasr-assumptions-workbook.xlsx?la=en>.

²⁵ See https://www.epw.qld.gov.au/_data/assets/pdf_file/0029/32987/queensland-energy-and-jobs-plan.pdf.

²⁶ See https://www.epw.qld.gov.au/_data/assets/pdf_file/0030/32988/queensland-supergrid-infrastructure-blueprint.pdf.

²⁷ See https://www.epw.qld.gov.au/_data/assets/pdf_file/0036/49599/REZ-roadmap.pdf.

²⁸ See <https://www.powerlink.com.au/planning-report/transmission-annual-planning-report-2023>.

Generation Hosting capacity or access rights				
There is no hosting capacity provided by the jurisdictional planning body which directly applies to this REZ. AEMO will work with the relevant parties to understand the hosting capacity for future publications.				
Resource metrics				
Resource	Solar		Wind	
Resource Quality	A		D	
Renewable Potential (MW)	8,000		3,900	
Climate hazard				
Temperature score	D		Bushfire score	C

Margin loss factors

Marginal Loss Factor		
Technology	Voltage (kV)	2024-25 MLF
Solar	132	0.9370

Congestion and curtailment

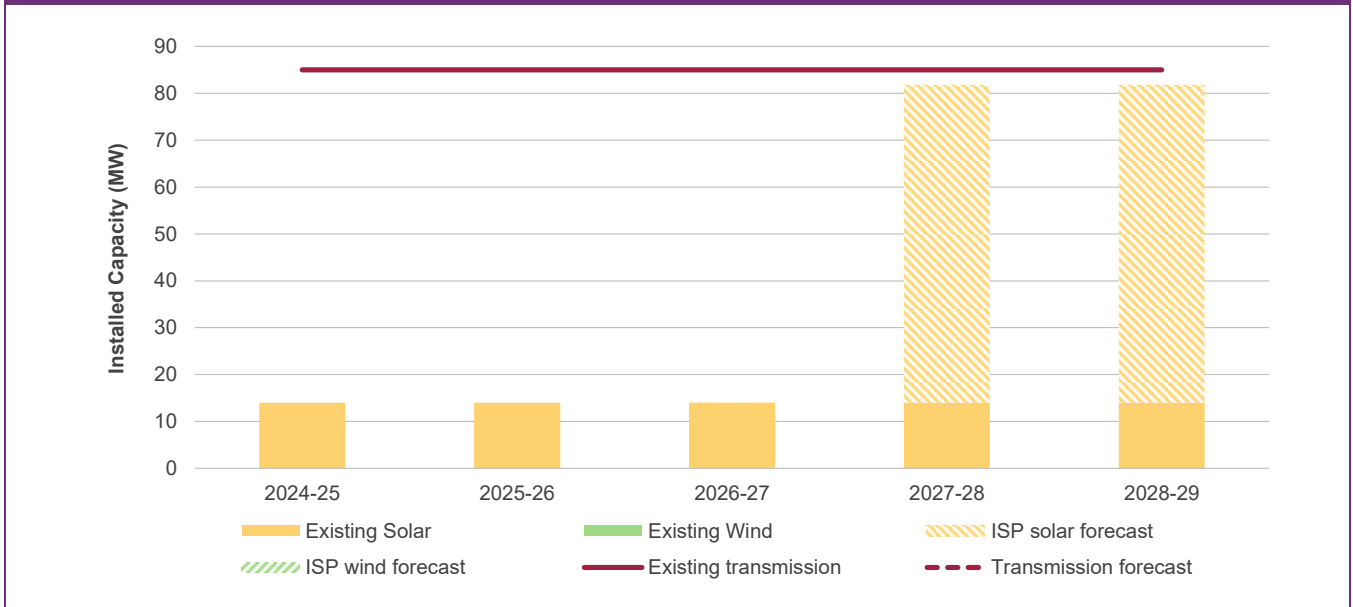
Congestion information – calendar year 2023			
Constraint ID	Binding hours	Marginal value (\$)	Most affected generation
-	-	-	-

VRE semi-scheduled curtailment – calendar year 2023						
DUID	Generator name	Maximum Capacity (MW)	Average curtailment (%)	Average curtailment (MW)	Curtailment (MWh)	
-	-	-	-	-	-	
VRE curtailment – ISP forecast						
Scenario	2025		2026		2027	
	Curtailment	Economic offloading	Curtailment	Economic offloading	Curtailment	Economic offloading
Step Change	-	4%	-	3%	-	19%

ISP forecast

ISP forecast												
VRE outlook	Solar PV (MW)						Wind (MW)					
	Existing/ committed/ anticipated	Projected					Existing/ committed/ anticipated	Projected				
		2025	2026	2027	2028	2029		2025	2026	2027	2028	2029
Step Change	14	-	-	-	50	50	-	-	-	-	-	-

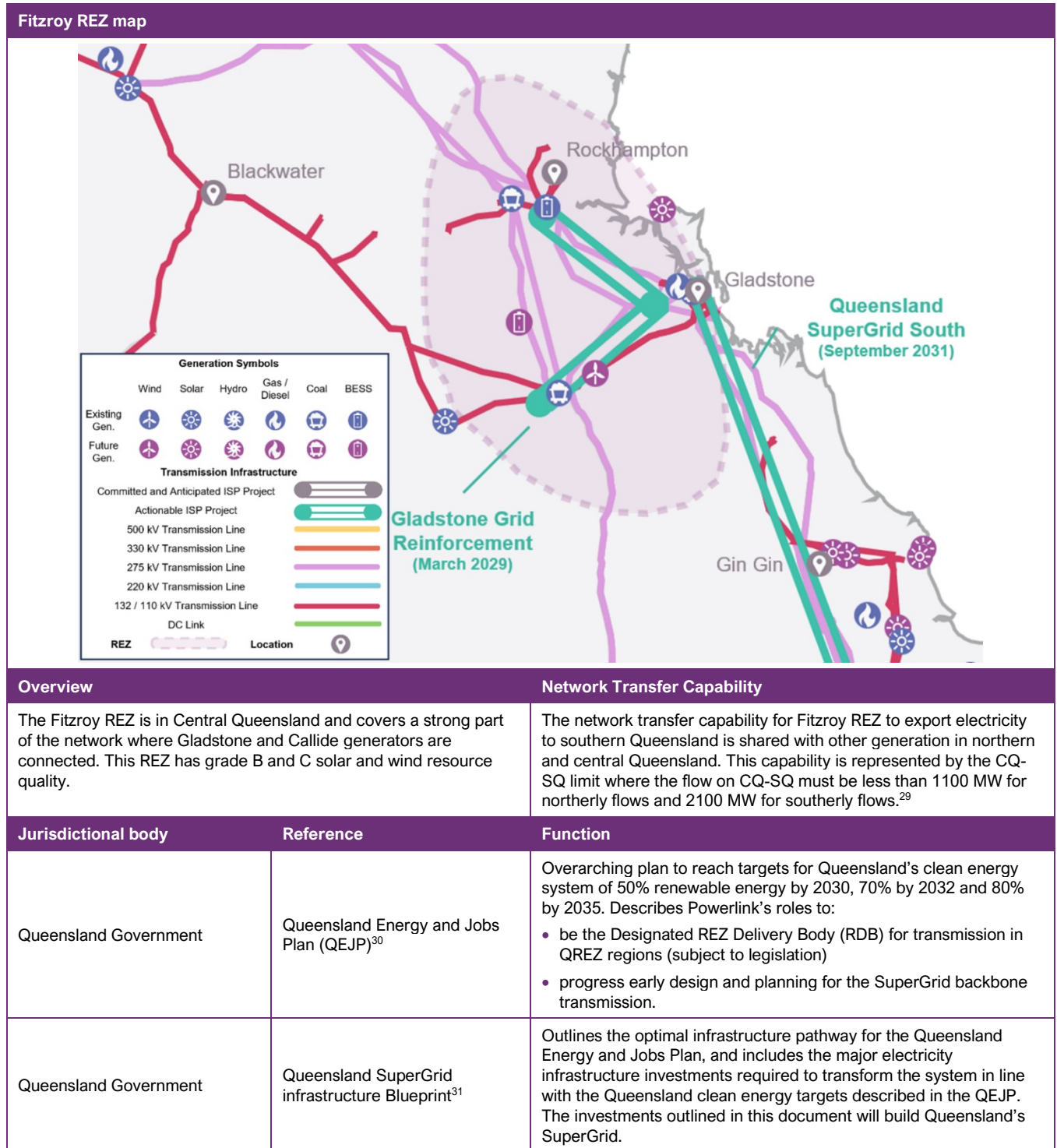
Transmission access expansion for Step Change



Committed, Anticipated, and Actionable Transmission Projects	Timing	Status	Increase in network transfer capability
-	-	-	-

A4.7 Q6 – Fitzroy

REZ information



²⁹ See ‘Build Limits’ tab of the Draft 2024 Inputs and Assumptions Workbook, at <https://aemo.com.au/-/media/files/major-publications/isp/2023/2023-iasr-assumptions-workbook.xlsx?la=en>.

³⁰ See https://www.epw.qld.gov.au/_data/assets/pdf_file/0029/32987/queensland-energy-and-jobs-plan.pdf.

³¹ See https://www.epw.qld.gov.au/_data/assets/pdf_file/0030/32988/queensland-supergrid-infrastructure-blueprint.pdf.

Queensland Government	2023 Queensland REZ Roadmap ³²	Outlines the pathway for connecting around 22 GW of new wind and solar generation.	
Powerlink	Transmission Annual Planning Report ³³	Existing Transmission Planning Function.	
Generation Hosting capacity or access rights			
Powerlink lists the ‘expected installed generation’ to be 3,500-4,600 MW following the transmission capacity provided by the Gladstone Grid Reinforcement ³⁴ . This is an actionable ISP project and has been advised to be completed by March 2029 ³⁵ .			
This generation connecting to this REZ is also subject to the CQ-SQ network limit ³⁶ . AEMO recommends detailed investigations to understand how this limit impacts the REZ’s hosting capacity.			
Resource metrics			
Resource	Solar		Wind
Resource Quality	B		C
Renewable Potential (MW)	7,533		3,500
Climate hazard			
Temperature score	C		Bushfire score B

Margin loss factors

Marginal Loss Factor		
Technology	Voltage (kV)	2024-25 MLF
Solar	132	0.9319

Congestion and curtailment

Congestion information – calendar year 2023			
Constraint ID	Binding hours	Marginal value (\$)	Most affected generation
-	-	-	-

VRE semi-scheduled curtailment – calendar year 2023						
DUID	Generator name	Maximum Capacity (MW)	Average curtailment (%)	Average curtailment (MW)	Curtailment (MWh)	
MOUSF1	Moura Solar Farm	82	1.9	0.3	3,010	
VRE curtailment – ISP forecast						
Scenario	2025		2026		2027	
	Curtailment	Economic offloading	Curtailment	Economic offloading	Curtailment	Economic offloading
Step Change	-	1%	-	-	-	3%

³² See https://www.epw.qld.gov.au/_data/assets/pdf_file/0036/49599/REZ-roadmap.pdf.

³³ See <https://www.powerlink.com.au/planning-report/transmission-annual-planning-report-2023>.

³⁴ Table 2, 1 2023 TAPR, Powerlink, at https://aemo.com.au/-/media/files/stakeholder_consultation/consultations/nem-consultations/2023/draft-2024-isp-consultation/draft-2024-isp.pdf?la=en.

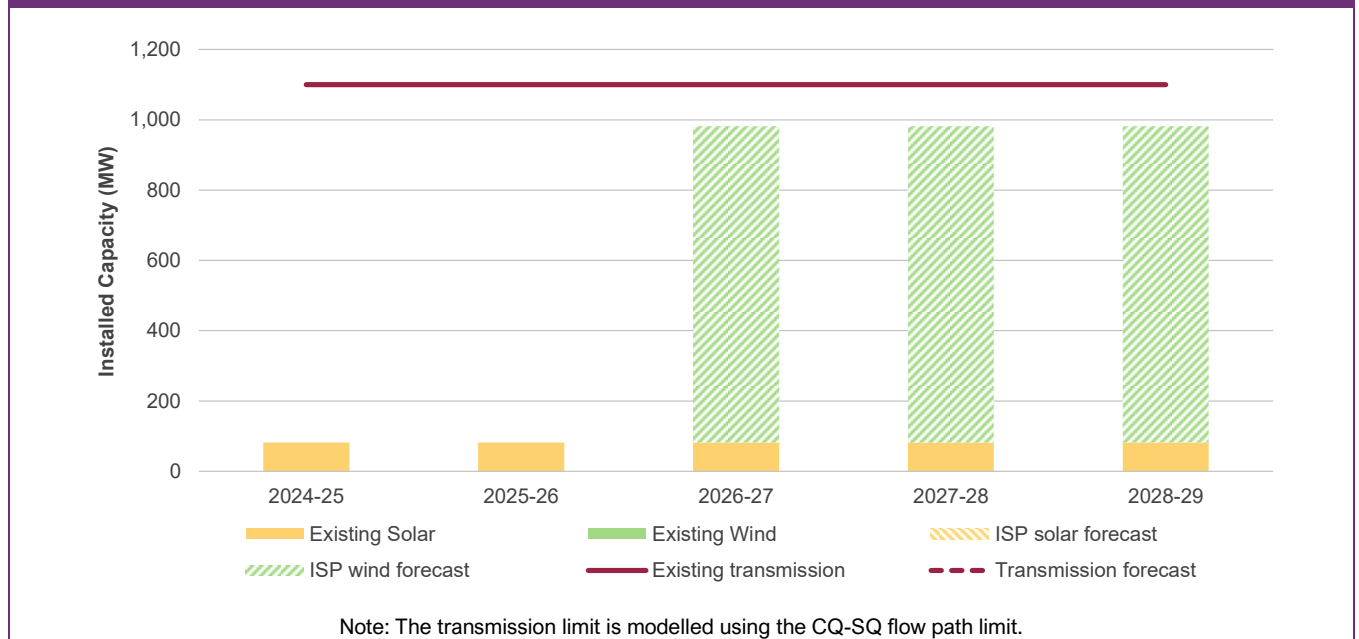
³⁵ NEM Transmission Augmentation Information May 2024, at https://aemo.com.au/-/media/files/electricity/nem/planning_and_forecasting/transmission-augmentation-information/nem-transmission-augmentation-information-may-2024.xlsx?la=en.

³⁶ See ‘Build Limits’ tab of the Draft 2024 Inputs and Assumptions Workbook, at <https://aemo.com.au/-/media/files/major-publications/isp/2023/2023-iasr-assumptions-workbook.xlsx?la=en>.

ISP forecast

ISP forecast												
VRE outlook	Solar PV (MW)					Wind (MW)						
	Existing/ committed/ anticipated	Projected					Existing/ committed/ anticipated	Projected				
		2025	2026	2027	2028	2029		2025	2026	2027	2028	2029
Step Change	82	-	-	-	-	-	-	-	-	900	900	900

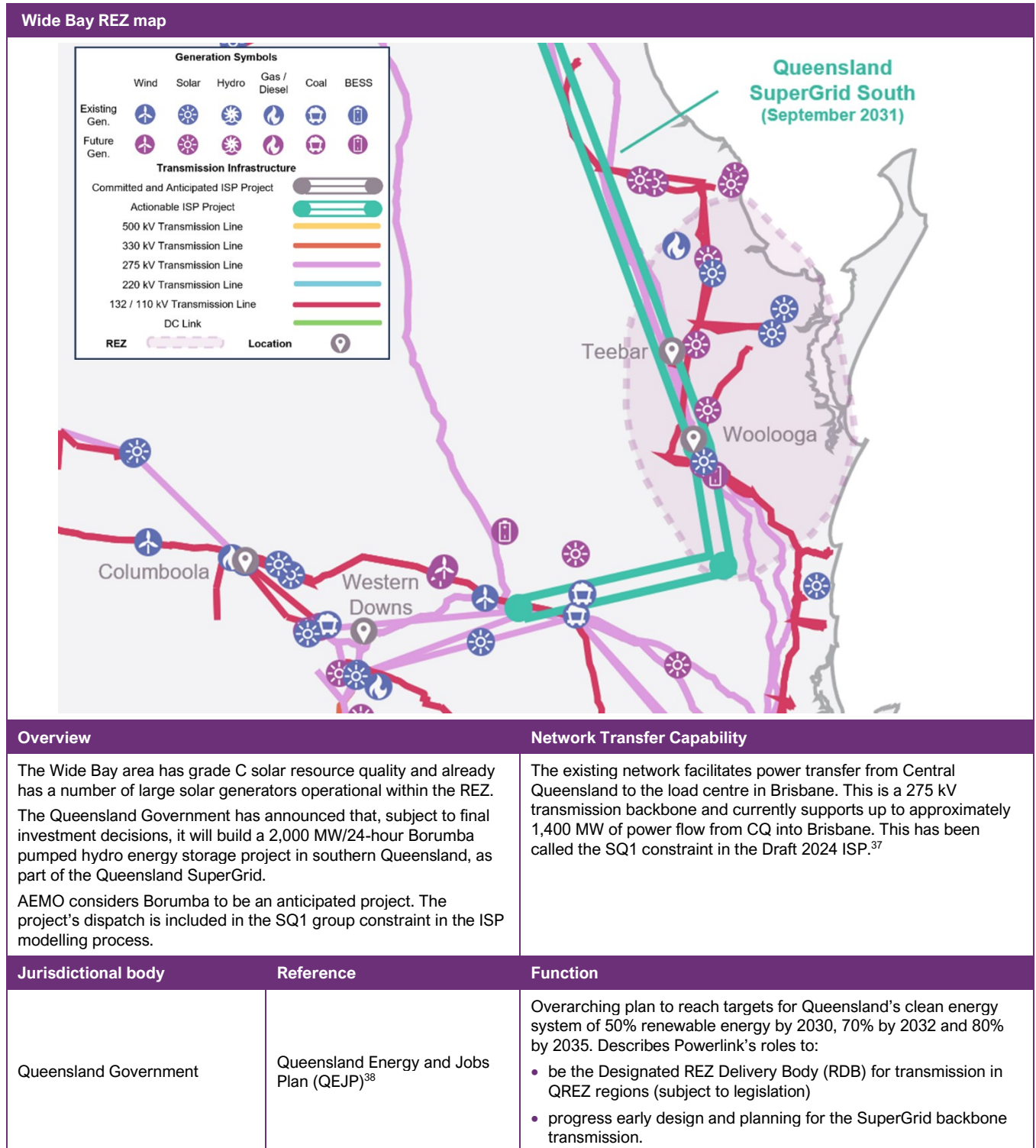
Transmission access expansion for Step Change



Committed, Anticipated, and Actionable Transmission Projects	Timing	Status	Increase in network transfer capability
-	-	-	-

A4.8 Q7 – Wide Bay

REZ information



³⁷ See 'Build Limits' tab of the Draft 2024 Inputs and Assumptions Workbook, at <https://aemo.com.au/-/media/files/major-publications/isp/2023/2023-iasr-assumptions-workbook.xlsx?la=en>.

³⁸ https://www.epw.qld.gov.au/_data/assets/pdf_file/0029/32987/queensland-energy-and-jobs-plan.pdf.

Queensland Government	Queensland SuperGrid infrastructure Blueprint ³⁹	Outlines the Optimal infrastructure pathway for the QEJP, and includes the major electricity infrastructure investments required to transform the system in line with the Queensland clean energy targets described in the QEJP. The investments outlined in this document will build Queensland’s SuperGrid.
Queensland Government	2023 Queensland REZ Roadmap ⁴⁰	Outlines the pathway for connecting around 22 GW of new wind and solar generation
Powerlink	Transmission Annual Planning Report ⁴¹	Existing Transmission Planning Function

Generation Hosting capacity or access rights

This is a ‘Phase 2 REZ’ as part of the Queensland Energy Roadmap⁴² with an ‘expected installed generation’ to be 1,600-2,000 MW⁴³. Generation connecting to this REZ is also subject to the SQ1 group constraint⁴⁴. AEMO recommends detailed investigations to understand how this limit impacts the REZ’s hosting capacity.

Resource metrics

Resource	Solar	Wind
Resource Quality	C	E
Renewable Potential (MW)	2,200	1,100

Climate hazard			
Temperature score	B	Bushfire score	E

Margin loss factors

Marginal Loss Factor		
Technology	Voltage (kV)	2024-25 MLF
Solar	132	0.9828 - 0.9850

Congestion and curtailment

Congestion information – calendar year 2023			
Constraint ID	Binding hours	Marginal value (\$)	Most affected generation
-	-	-	-

VRE semi-scheduled curtailment – calendar year 2023					
DUID	Generator name	Maximum Capacity (MW)	Average curtailment (%)	Average curtailment (MW)	Curtailment (MWh)
CHILDSF1	Childers Solar Farm	56	0.0	0.0	2
SRSF1	Susan River Solar Farm	75	0.0	0.0	7
WOOLGSF1	Woolooga Solar Farm	176	0.0	0.0	0

³⁹ https://www.epw.qld.gov.au/_data/assets/pdf_file/0030/32988/queensland-supergrid-infrastructure-blueprint.pdf.

⁴⁰ https://www.epw.qld.gov.au/_data/assets/pdf_file/0036/49599/REZ-roadmap.pdf.

⁴¹ See <https://www.powerlink.com.au/planning-report/transmission-annual-planning-report-2023>.

⁴² See page 49 of 2023 Queensland Renewable Energy Zone Roadmap, at https://www.epw.qld.gov.au/_data/assets/pdf_file/0036/49599/REZ-roadmap.pdf.

⁴³ Table 2, 1 2023 TAPR, Powerlink, at <https://www.powerlink.com.au/sites/default/files/2023-11/2023%20Transmission%20Annual%20Planning%20Report%20-%20Whole%20Document.pdf>.

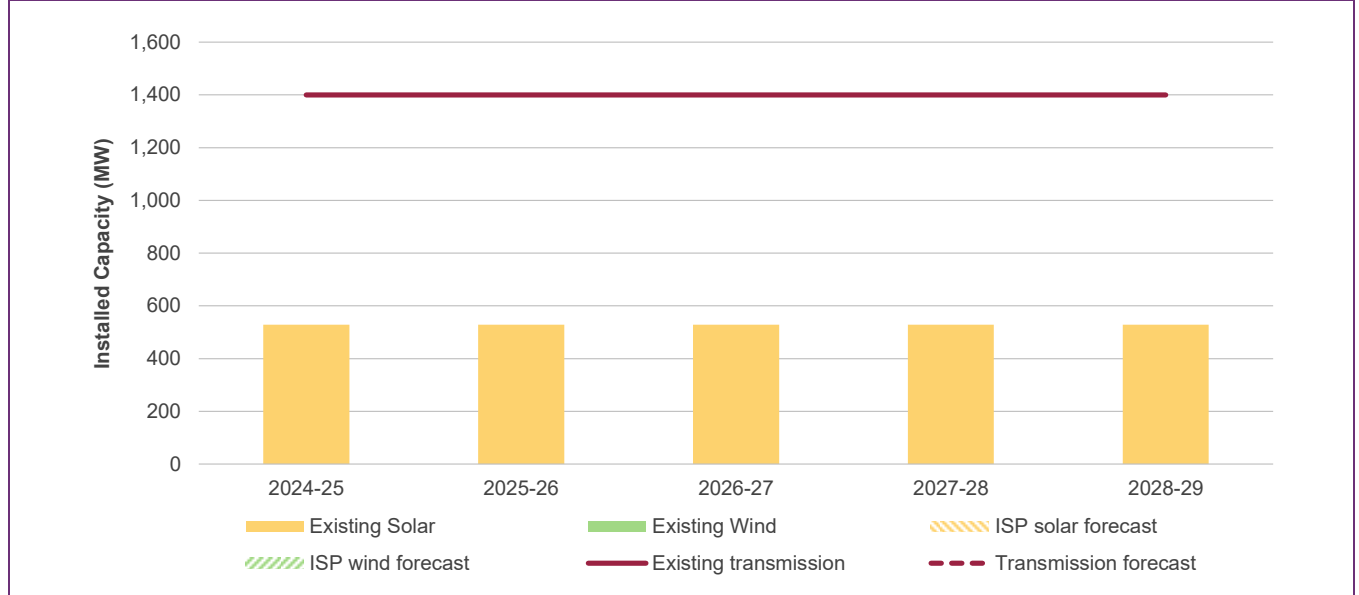
⁴⁴ See ‘Build Limits’ tab of the Draft 2024 Inputs and Assumptions Workbook, at <https://aemo.com.au/-/media/files/major-publications/isp/2023/2023-iasr-assumptions-workbook.xlsx?la=en>.

VRE curtailment – ISP forecast						
Scenario	2025		2026		2027	
	Curtailment	Economic offloading	Curtailment	Economic offloading	Curtailment	Economic offloading
Step Change	-	5%	-	3%	-	8%

ISP forecast

ISP forecast												
VRE outlook	Solar PV (MW)						Wind (MW)					
	Existing/ committed/ anticipated	Projected					Existing/ committed/ anticipated	Projected				
		2025	2026	2027	2028	2029		2025	2026	2027	2028	2029
Step Change	528	-	-	-	-	-	-	-	-	-	-	-

Transmission access expansion for Step Change

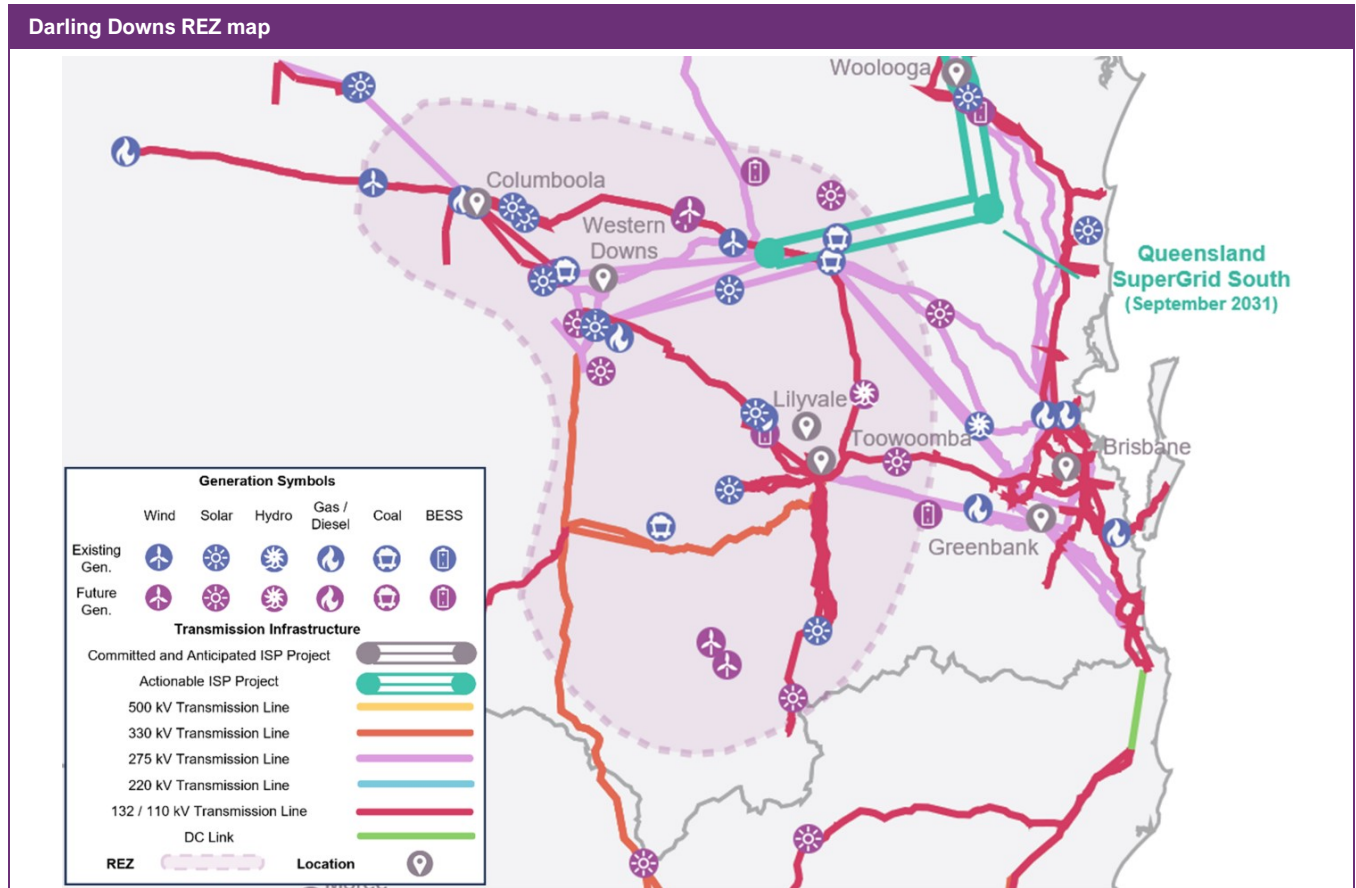


Note: The transmission access expansion forecasts show the results for the SQ1 group constraint augmentation, which includes Q7 as well as the effect of CQ-SQ flow. The transmission limit is modelled using the SQ1 group constraint limit.

Committed, Anticipated, and Actionable Transmission Projects	Timing	Status	Increase in network transfer capability
-	-	-	-

A4.9 Q8 – Darling Downs

REZ information



Overview	Network Transfer Capability
<p>The Darling Downs REZ extends from the border of New South Wales around Dumaresq up to Columboola within the Surat region of Queensland, and has B and C grade solar and wind resource quality. A number of large solar and wind projects are already connected within the zone.</p>	<p>The Darling Downs REZ has high network capacity and is near QNI and Brisbane. The ultimate retirement of generation within this REZ will allow for increased VRE connections.</p> <p>The existing network facilitates power transfer from south west Queensland to the load centre in Brisbane. This transmission can support up to approximately 5,300 MW of generation into Brisbane. This capability is shared with existing coal and gas generation in the REZ, the flow of power from New South Wales, and the flow of power from central Queensland. This sharing is captured by the SWQLD1 transmission limit constraint that facilitates power flow to load centres in south east Queensland. Changes to network capability for this REZ are therefore reflected in the SWQLD1 limit.⁴⁵</p>

Jurisdictional body	Reference	Function
Queensland Government	Queensland Energy and Jobs Plan (QEJP) ⁴⁶	<p>Overarching plan to reach targets for Queensland’s clean energy system of 50% renewable energy by 2030, 70% by 2032 and 80% by 2035. Describes Powerlink’s roles to:</p> <ul style="list-style-type: none"> be the Designated REZ Delivery Body (RDB) for transmission in QREZ regions (subject to legislation). progress early design and planning for the SuperGrid backbone transmission.

⁴⁵ See ‘Build Limits’ tab of the Draft 2024 Inputs and Assumptions Workbook, at <https://aemo.com.au/-/media/files/major-publications/isp/2023/2023-iasr-assumptions-workbook.xlsx?la=en>.

⁴⁶ See https://www.epw.qld.gov.au/_data/assets/pdf_file/0029/32987/queensland-energy-and-jobs-plan.pdf.

Queensland Government	Queensland SuperGrid infrastructure Blueprint ⁴⁷	Outlines the optimal infrastructure pathway for the QEJP, and includes the major electricity infrastructure investments required to transform the system in line with the Queensland clean energy targets described in the QEJP. The investments outlined in this document will build Queensland’s SuperGrid.
Queensland Government	2023 Queensland REZ Roadmap ⁴⁸	Outlines the pathway for connecting around 22 GW of new wind and solar generation.
Powerlink	Transmission Annual Planning Report ⁴⁹	Existing Transmission Planning Function.

Generation Hosting capacity or access rights

Powerlink lists the ‘expected installed generation’ to be 7,600-9,600 MW⁵⁰ for this REZ. At present there is already significant existing VRE and non-VRE in the area. Powerlink is expected to provide transmission capacity in excess of 4,000 MW of hosting capacity in the Southern Downs and Western Downs area through construction of dedicated 275 kV transmission lines⁵¹.

Generation connecting to this REZ is also subject to the SWQLD1 transmission limit⁵². AEMO recommends detailed investigations to understand how this limit impacts the REZ’s hosting capacity.

Resource metrics

Resource	Solar	Wind
Resource Quality	B	C
Renewable Potential (MW)	6,992	5,600 ⁵³

Climate hazard

Temperature score	Bushfire score
C	E

Margin loss factors

Marginal Loss Factor		
Technology	Voltage (kV)	2024-25 MLF
Solar	110	0.9810 - 0.9847
	132	0.9433 - 0.9788
	275	0.9701 - 0.9785
Wind	132	0.9770
	275	0.9672

⁴⁷ See https://www.epw.qld.gov.au/_data/assets/pdf_file/0030/32988/queensland-supergrid-infrastructure-blueprint.pdf.

⁴⁸ See https://www.epw.qld.gov.au/_data/assets/pdf_file/0036/49599/REZ-roadmap.pdf.

⁴⁹ See <https://www.powerlink.com.au/planning-report/transmission-annual-planning-report-2023>.

⁵⁰ Table 2.1, 2023 TAPR, Powerlink, at <https://www.powerlink.com.au/sites/default/files/2024-04/Transmission%20Annual%20Planning%20Report%20-%202023%20-%20Full%20Document.pdf>.

⁵¹ Section 2.4.2, 2023 TAPR, Powerlink.

⁵² See ‘Build Limits’ tab of the Draft 2024 Inputs and Assumptions Workbook, at <https://aemo.com.au/-/media/files/major-publications/isp/2023/2023-iasr-assumptions-workbook.xlsx?la=en>.

⁵³ Darling Downs REZ wind outlook exceeds the expected renewable potential based on the geographical size and resource quality. The modelling allows for additional wind above this wind resource limit, but the additional capacity incurs a land use penalty factor of \$0.29 million/MW. Even with this penalty applied, the ISP model still projects additional wind capacity in *Step Change* by 2049-50.

Congestion and curtailment

Congestion information – calendar year 2023			
Constraint ID	Binding hours	Marginal value (\$)	Most affected generation
Q>NIL_YLMR	676.9	7,345,087.7	Generation contributing to flow from Yarranlea to Middle Ridge 110 kV
N::Q_NIL_KC	25.4	11,175.6	Kogan Creek Power Station, and generation contributing to northward flow on Dumaresq-Bulli Creek 330 kV lines and Terranora interconnector
Q>NIL_DRLCLB_NIL	10.4	143,383.3	Generation contributing to flow from Drillham to Columboola 132 kV

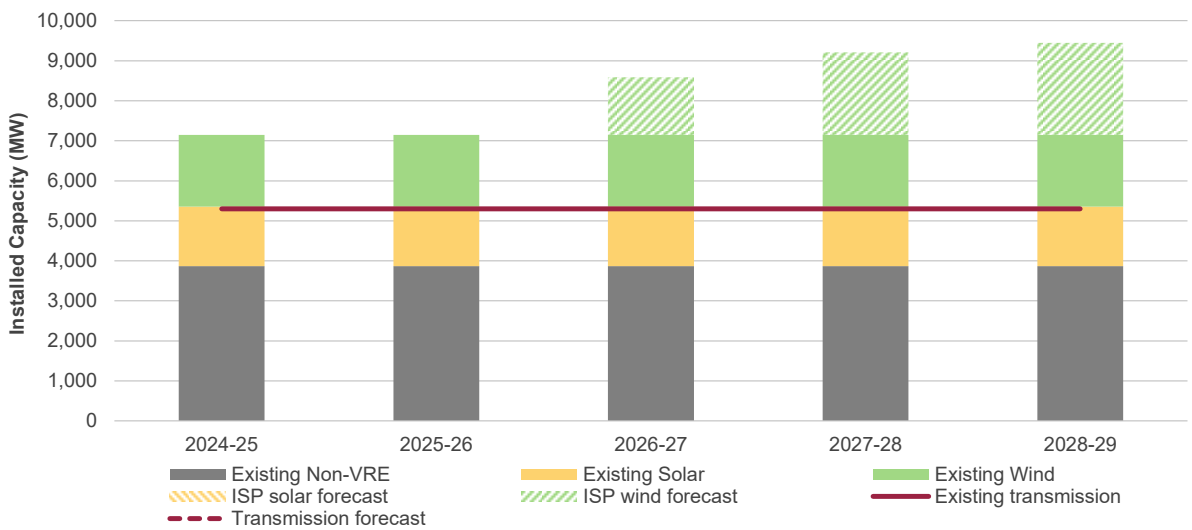
VRE semi-scheduled curtailment – calendar year 2023					
DUID	Generator name	Maximum Capacity (MW)	Average curtailment (%)	Average curtailment (MW)	Curtailment (MWh)
BLUEGSF1	Bluegrass Solar Farm	148	0.9	0.4	3,600
COLUMSF1	Columboola Solar Farm	162	0.1	0.0	398
COOPGWF1	Coopers Gap Wind Farm	440	0.0	0.0	374
DDSF1	Darling Downs Solar Farm	108	0.1	0.0	185
DULAWF1	Dulacca Wind Farm	173	0.0	0.0	145
EDENVSF1	Edenvale Solar Park	146	0.2	0.0	432
GANGARR1	Gangarri Solar Farm	120	0.2	0.0	368
MARYRSF1	Maryrrough Solar Farm	27	2.5	0.2	1,576
OAKEY1SF	Oakey 1 Solar Farm	25	0.4	0.0	202
OAKEY2SF	Oakey 2 Solar Farm	55	0.1	0.0	180
WANDSF1	Wandoan Solar Farm 1	125	0.0	0.0	16
WARWSF1	Warwick Solar Farm 1	32	0.3	0.0	170
WARWSF2	Warwick Solar Farm 2	32	0.3	0.0	180
WDGPH1	Western Downs GPH	400	0.0	0.0	151
YARANSF1	Yarranlea Solar Farm	103	1.9	0.5	4,596

VRE curtailment – ISP forecast						
Scenario	2025		2026		2027	
	Curtailment	Economic offloading	Curtailment	Economic offloading	Curtailment	Economic offloading
Step Change	-	1%	-	1%	-	3%

ISP forecast

ISP forecast												
VRE outlook	Solar PV (MW)					Wind (MW)						
	Existing/ committed/ anticipated	Projected					Existing/ committed/ anticipated	Projected				
		2025	2026	2027	2028	2029		2025	2026	2027	2028	2029
Step Change	1,485	-	-	-	-	-	1,788	-	-	1,450	2,050	2,300

Transmission access expansion for Step Change

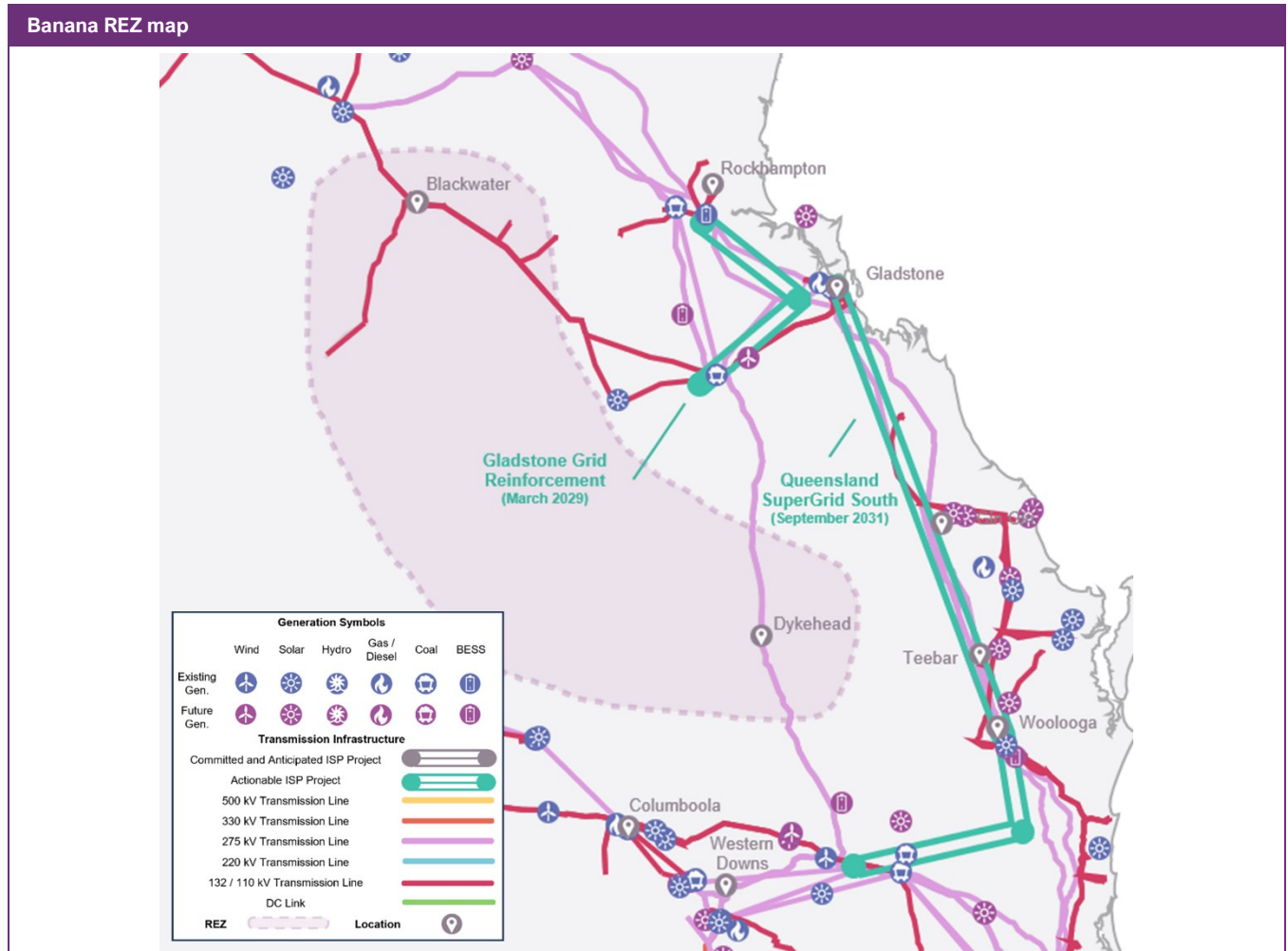


Note: The transmission access expansion forecasts show the results for the SWQLD1 group constraint augmentation, which includes Q8 as well as the effect of CQ-SQ and QNI flow. The transmission limit is modelled using the SWQLD1 group constraint limit.

Committed, Anticipated, and Actionable Transmission Projects	Timing	Status	Increase in network transfer capability
-	-	-	-

A4.10 Q9 – Banana

REZ information



Overview	Network Transfer Capability	
<p>The Banana REZ is located roughly 200 km south-west of Gladstone and lies north of the CQ-SQ flow path. It has B grade solar resource quality. There are currently no generators and limited high voltage network in this area.</p> <p>AEMO understands from the Queensland Government and from Powerlink that transmission augmentation projects for the Banana REZ are likely to be delivered as a dedicated asset of some kind. This has been treated similar to a generation connection asset in the ISP model, rather than a network augmentation option.</p>	<p>The network transfer capability of Q9 is 150 MW. There is currently very little high voltage network in the area. However, there is some 132 kV network on the edge of the REZ, supporting the townships of Moura and Biloela.</p>	
Jurisdictional body	Reference	Function
<p>Queensland Government</p>	<p>Queensland Energy and Jobs Plan (QEJP)⁵⁴</p>	<p>Overarching plan to reach targets for Queensland’s clean energy system of 50% renewable energy by 2030, 70% by 2032 and 80% by 2035. Describes Powerlink’s roles to:</p> <ul style="list-style-type: none"> • be the Designated REZ Delivery Body (RDB) for transmission in QREZ regions (subject to legislation). • progress early design and planning for the SuperGrid backbone transmission.

⁵⁴ See https://www.epw.qld.gov.au/_data/assets/pdf_file/0029/32987/queensland-energy-and-jobs-plan.pdf.

Queensland Government	Queensland SuperGrid infrastructure Blueprint ⁵⁵	Outlines the Optimal infrastructure pathway for the QEJP, and includes the major electricity infrastructure investments required to transform the system in line with the Queensland clean energy targets described in the QEJP. The investments outlined in this document will build Queensland’s SuperGrid.
Queensland Government	2023 Queensland REZ Roadmap ⁵⁶	Outlines the pathway for connecting around 22 GW of new wind and solar generation.
Powerlink	Transmission Annual Planning Report ⁵⁷	Existing Transmission Planning Function.

Generation Hosting capacity or access rights

There is no hosting capacity provided by the jurisdictional planning body which directly applies to this REZ. AEMO will work with the relevant parties to understand the hosting capacity for future publications.

Resource metrics

Resource	Solar	Wind
Resource Quality	B	E
Renewable Potential (MW)	6,100	3,400

Climate hazard

Temperature score	Bushfire score
C	B

Margin loss factors

Marginal Loss Factor		
Technology	Voltage (kV)	2024-25 MLF
-	-	-

Congestion and curtailment

Congestion information – calendar year 2023			
Constraint ID	Binding hours	Marginal value (\$)	Most affected generation
Q>NIL_EMCM_6056	628.2	1,023,311.4	Generation contributing to flow from Emerald to Comet 66 kV
Q>NIL_EMBW_EMLV_DS	110.8	94,432.2	Generation contributing to flow from Emerald to Lilyvale 66 kV on trip of the Emerald-Comet-Blackwater 66 kV line

VRE semi-scheduled curtailment – calendar year 2023					
DUID	Generator name	Maximum Capacity (MW)	Average curtailment (%)	Average curtailment (MW)	Curtailment (MWh)
-	-	-	-	-	-

VRE curtailment – ISP forecast						
Scenario	2025		2026		2027	
	Curtailment	Economic offloading	Curtailment	Economic offloading	Curtailment	Economic offloading
Step Change	-	-	-	-	-	-

⁵⁵ See https://www.epw.qld.gov.au/_data/assets/pdf_file/0030/32988/queensland-supergrid-infrastructure-blueprint.pdf.

⁵⁶ See https://www.epw.qld.gov.au/_data/assets/pdf_file/0036/49599/REZ-roadmap.pdf.

⁵⁷ See <https://www.powerlink.com.au/planning-report/transmission-annual-planning-report-2023>.

ISP forecast

ISP forecast												
VRE outlook	Solar PV (MW)						Wind (MW)					
	Existing/ committed/ anticipated	Projected					Existing/ committed/ anticipated	Projected				
		2025	2026	2027	2028	2029		2025	2026	2027	2028	2029
Step Change	-	-	-	-	-	-	-	-	-	-	-	-
Transmission access expansion for <i>Step Change</i>												
There are no existing, committed, anticipated VRE projects for this REZ and the modelling outcomes for <i>Progressive Change</i> and <i>Step Change</i> scenarios did not project any additional VRE for this REZ. Therefore, no VRE curtailment or transmission expansion occurs in this REZ in those scenarios.												
Committed, Anticipated, and Actionable Transmission Projects				Timing			Status			Increase in network transfer capability		
-				-			-			-		

A4.11 Non-REZ

Congestion and curtailment

Congestion information – calendar year 2023			
Constraint ID	Binding hours	Marginal value (\$)	Most affected generation
N>Q-NIL_757_758	54.7	16,189.9	Generation contributing to northward flow on the Terranora - Mudgeeraba 110 kV lines.

VRE semi-scheduled curtailment – calendar year 2023					
DUID	Generator name	Maximum Capacity (MW)	Average curtailment (%)	Average curtailment (MW)	Curtailment (MWh)
EMERASF1	Emerald Solar Park	72	3.9	0.7	6,467