Reconductor 33kV Feeder 341 from Gympie to Toolara Forest

Business Case

19 November 2024

energex
Part of Energy Queensland

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DOCUMENT VERSION

Version Number	Change Detail	Date	Updated by
1.0	Approved Version	15/11/2024	General Manager Grid Planning

1 SUMMARY

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<tr><td>Expenditure category</td><td>☐ Replacement ☒ Augmentation ☐ Connections ☐ Non-Network</td></tr>
<tr><td>Identified need</td><td>☐ Legislation ☒ Regulatory compliance
☐ Reliability ☐ CECV ☐ Safety ☐ Environment ☐ Financial
☐ Other

Under its Distribution Authority, Energex must adhere to the Safety Net which identifies the principles that apply to the operation of network assets under network contingency conditions. It has been identified that under a N-1 contingency of feeder 429 (Gympie Bulk Supply (SST8) to Toolara Forest Zone Substation (SSTLF) & Goomboorian zone substation (SSGBN)), Energex is unable to restore supply to customers within the timeframe as stipulated in the Safety Net.</td></tr>
<tr><td>Summary of preferred option</td><td>The proposed option is to reconductor a total of approximately 26 km of 33kV overhead section on feeder F341-1 from SST8 (Gympie) to P38682-A (near Toolara Forest) with Pluto conductor to address the regulatory compliance risk following an outage of 33kV feeder F429.</td></tr>
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<tr><th>Year</th><th>2025-26</th><th>2026-27</th><th>2027-28</th><th>2028-29</th><th>2029-30</th><th>2025-30</th></tr>
<tr><td>$m, direct 2022-23</td><td>$0.0m</td><td>$0.581m</td><td>$1.389m</td><td>$2.411m</td><td>$1.337m</td><td>$5.718m</td></tr>
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2 BACKGROUND

2.1 Network Arrangement

Toolara Forest (SSTLF), Tin Can Bay (SSTCB) and Goomboorian (SSGBN) zone substations are supplied by Gympie (SST8) bulk supply substation.

Toolara Forest 33/11kV substation (SSTLF) is supplied by two incoming 33kV feeders, feeder 429 (SST8 to SSTLF & SSGBN) and feeder 341 (SST8 to SSTCB & SSTLF). It comprises of 2 x 10/15MVA 33/11kV transformers.

Tin Can Bay 33/11kV substation (SSTCB) is supplied by one incoming 33kV feeder, feeder 341 (SST8 to SSTCB & SSTLF) through the Coondoo Creek (SSCDC) 33kV voltage regulator and it comprises of 1 x 5/6.5MVA and 1 x 5/8MVA 33/11kV transformers.

Goomboorian 33/11kV substation (SSGBN) is supplied by one incoming 33kV feeder 429 (SST8 to SSTLF & SSGBN) and comprises of 1 x 5/8MVA 33/11kV transformer.

SSTLF, SSTCB and SSGBN substations customers and loads are summarised below:

- **Toolara Forest zone substation (SSTLF)** – is a 33/11kV zone substation with maximum recorded load at SSTLF exceeding 20MVA in 2022/23.
- **Tin Can Bay zone substation (SSTCB)** – is a 33/11kV zone substation which supplies approximately 4,397 customers. The maximum recorded load at SSTCB was 8.22MVA in Summer 2022/23.
- **Goomboorian zone substation (SSGBN)** – is a 33/11kV zone substation which supplies approximately 1,116 customers. The maximum recorded load at SSGBN was 2.85MVA in Summer 2022/23.

Figure 1 shows the network arrangement and Figure 2 shows the geographic layout of the network area under study.

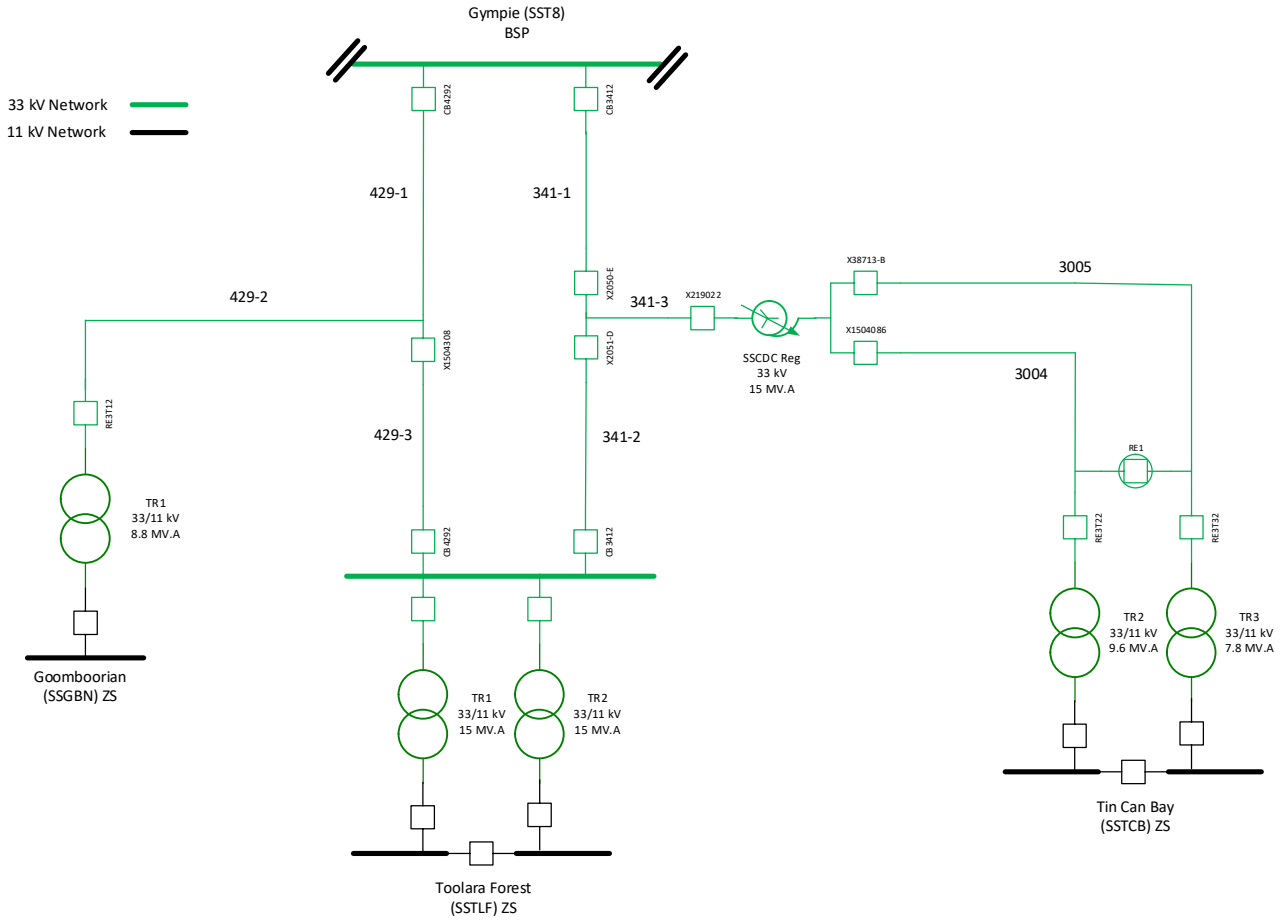


Figure 1 – Existing network arrangement (schematic view)

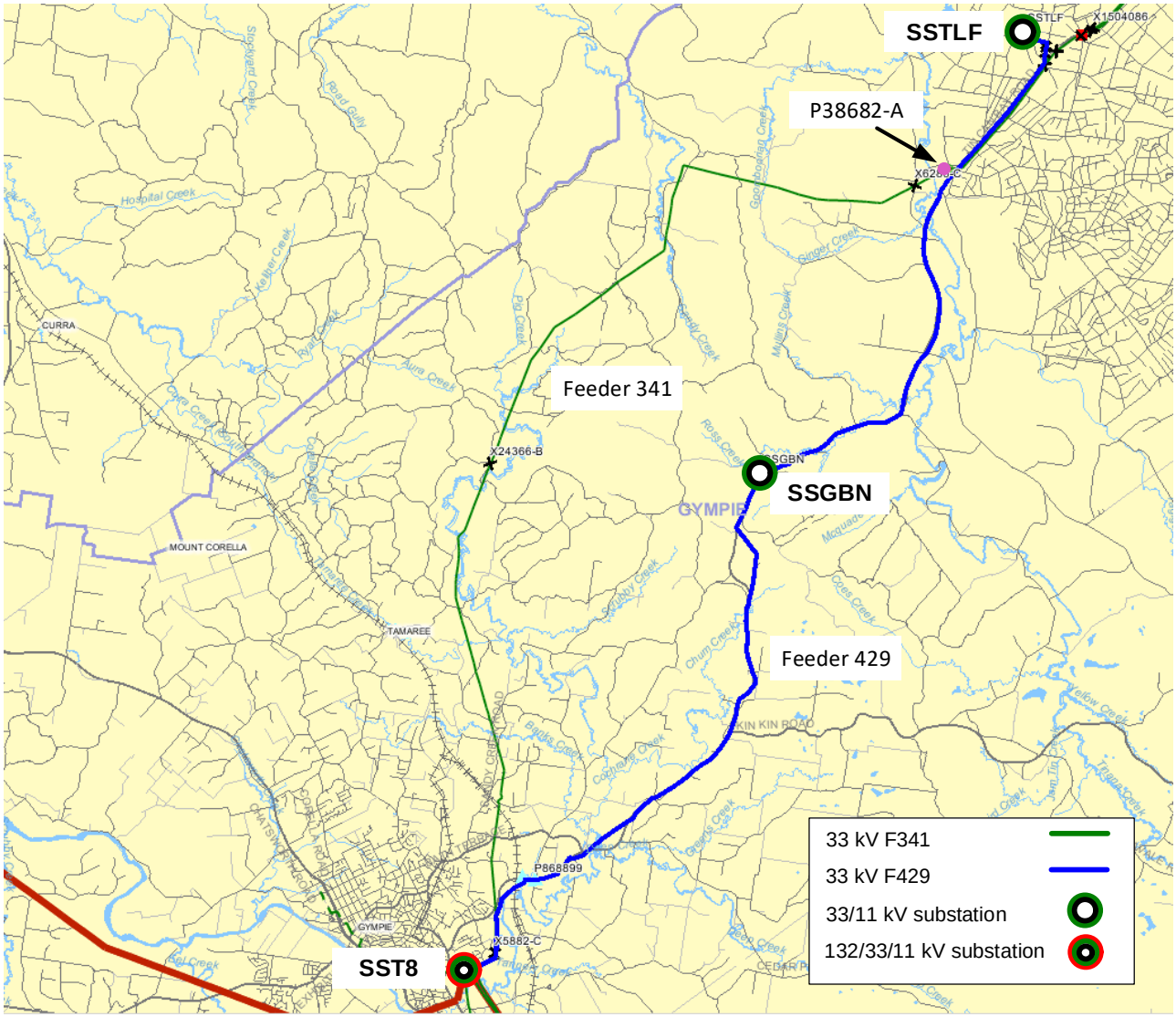


Figure 2 – Existing network arrangement (geographic view)

3 IDENTIFIED NEED

The identified need for this investment is to ensure supply in the area around Toolara Forest and Tin Can Bay remains compliant with Safety Net requirements, which is a regulatory obligation as outlined in the Distribution Authority.

This investment is driven by insufficient capacity to restore supply within the required timeframes as stipulated in the Safety Net under the following scenarios:

- 33kV feeder 341-1 will not be able to support the load at Toolara Forest and Tin Can Bay during peak period following a N-1 contingency of feeder 429 from 2023/2024 onwards.

3.1 Compliance

3.1.1 Sub-transmission Network

Under its Distribution Authority, Energex must adhere to the Safety Net which identifies the principles that apply to the operation of network assets under network contingency conditions. System contingency related capability is assessed against a 50% probability of exceedance (PoE) load forecast, available load transfers, capacity ratings, non-network response, mobile plant, mobile generators, and short-term ratings of plant and equipment where available.

33kV feeders 429 and 341-1 are all classified as Rural, and as such, the following Safety Net criteria apply:

Rural – following an N-1 event:

- No greater than 40MVA (16,000 customers) is without supply for more than 30 minutes
- No greater than 15MVA (6,000 customers) is without supply for more than 4 hours and
- No greater than 10MVA (4,000 customers) is without supply for more than 12 hours

Further to an assessment against its Safety Net obligations, in accordance with industry practice Energex also undertake an analysis of system capacity under normal conditions such that no sub-transmission network asset should be operated above its normal cyclic capacity for a 10% probability of exceedance (PoE) load forecast.

3.1.2 Distribution network

To meet our Safety Net obligations Energex needs to maintain adequate automated, remote and manual transfer capability via its 11kV feeders without exceeding their Normal Cyclic Capacities.

3.2 Sub-transmission Network Limitations

The network limitation that the proposed investment aims to address is the inability to restore supply to all load at SSGBN, SSTLF and SSTCB following the loss of 33kV feeder 429. There are both thermal and voltage constraints on the remaining feeder network.

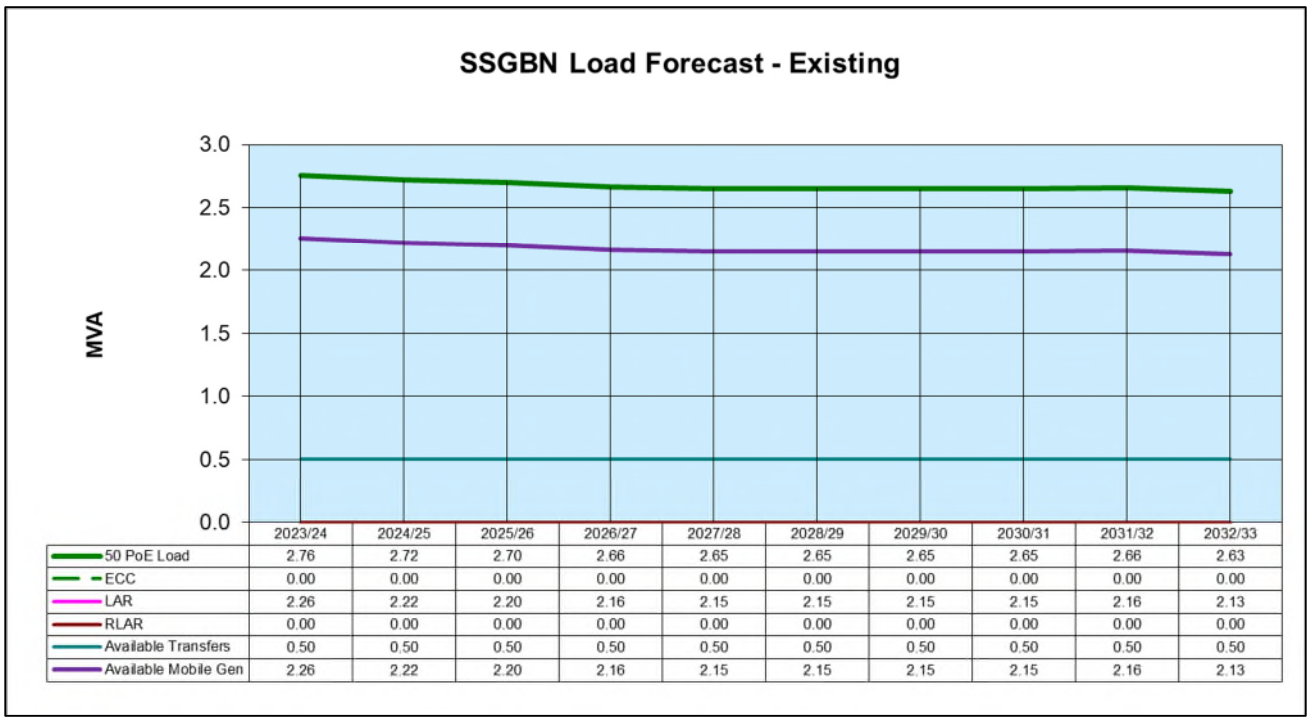
3.2.1 33kV Sub-transmission Feeder Limitation

33kV feeder 341-1 is comprised of 29 kms of 33kV overhead feeder, of which the majority of feeder consists of Dog conductor, which is the limiting conductor and provides an NCC, ECC and 2HEC as below:

The summer NCC, ECC and 2HEC rating for F341-1 is as below:

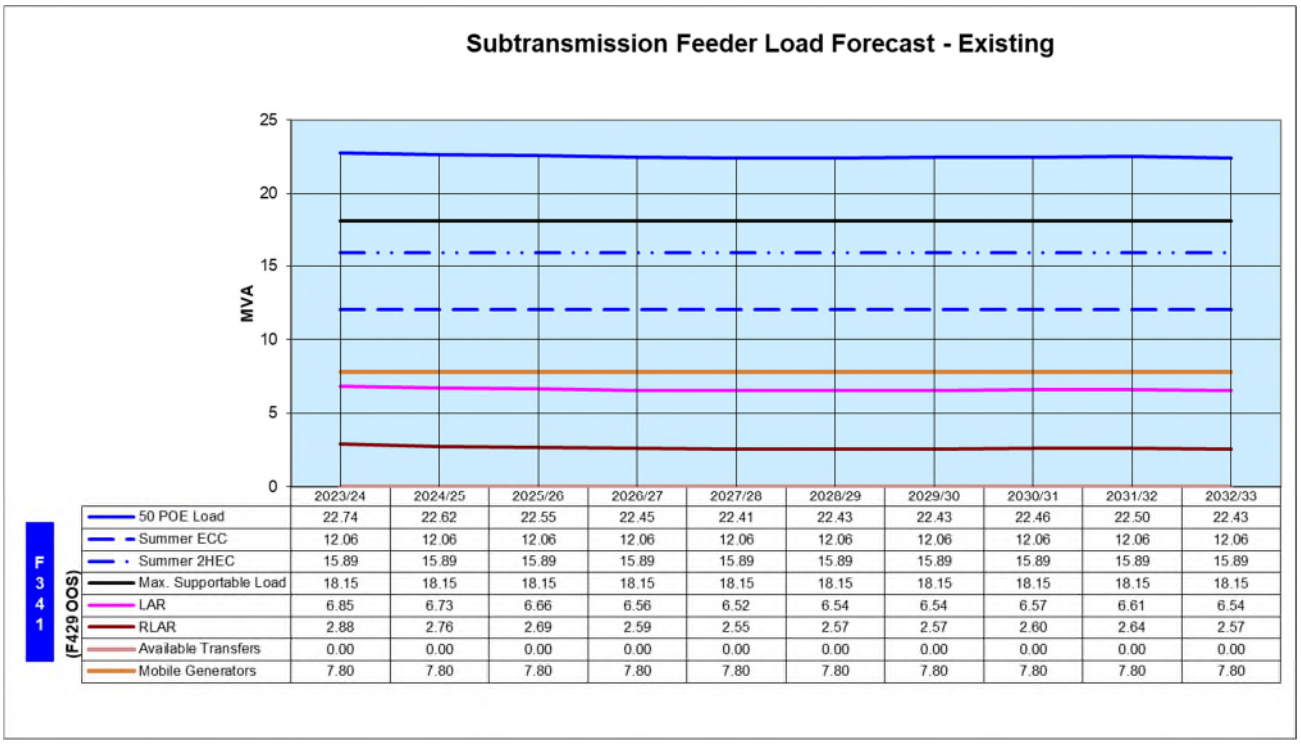
- Normal Cyclic Capacity (NCC) – 211A (Summer)
- Emergency Cyclic Capacity (ECC) – 211A (Summer)
- 2 Hour Emergency Capacity (2HEC) – 211A (Summer)

The loss of feeder 429 will result in total loss of supply to SSGBN, and feeder 341 will be the only feeder supplying SSTLF and SSTCB. Figure 3 and Figure 4 below show the 50% POE load forecast and load at risk of SSGBN and feeder 341 following the loss of 33kV feeder 429.



	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33
50 PoE Load	2.76	2.72	2.70	2.66	2.65	2.65	2.65	2.65	2.66	2.63
ECC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LAR	2.26	2.22	2.20	2.16	2.15	2.15	2.15	2.15	2.16	2.13
RLAR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Available Transfers	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Available Mobile Gen	2.26	2.22	2.20	2.16	2.15	2.15	2.15	2.15	2.16	2.13

Figure 3 – SSGBN load at risk following contingency on F429 (Summer)



	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33
50 POE Load	22.74	22.62	22.55	22.45	22.41	22.43	22.43	22.46	22.50	22.43
Summer ECC	12.06	12.06	12.06	12.06	12.06	12.06	12.06	12.06	12.06	12.06
Summer 2HEC	15.89	15.89	15.89	15.89	15.89	15.89	15.89	15.89	15.89	15.89
Max. Supportable Load	18.15	18.15	18.15	18.15	18.15	18.15	18.15	18.15	18.15	18.15
LAR	6.85	6.73	6.66	6.56	6.52	6.54	6.54	6.57	6.61	6.54
RLAR	2.88	2.76	2.69	2.59	2.55	2.57	2.57	2.60	2.64	2.57
Available Transfers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mobile Generators	7.80	7.80	7.80	7.80	7.80	7.80	7.80	7.80	7.80	7.80

Figure 4 – Load on F341-1 following contingency on F429 (Summer)

As shown above, based on the 50% POE load forecast for summer, there is a breach of Safety Net for feeder 341-1 (SST8 to SSTCB & SSTLF). For the loss of F429 (SST8 to SSTLF & SSGBN), SSGBN will mainly rely on mobile generations to restore supply and all the load on SSTCB and SSTLF will be supplied by 33kV feeder F341-1, which will overload F341-1 from 2023/24 onwards. This results in a Residual Load at Risk (RLAR) of around 2.8MVA following an outage of 33kV feeder 429 in summer 2023/24, after considering load transfers and deployment of 10 MW of mobile generation at SSGBN, SSTLF and SSTCB.

Furthermore, during summer 2023/24, the actual peak load recorded on F341 and F429 was 23.2MVA. Overloading of F341 had occurred and resulted in load shedding at SSTCB which affected 868 customers for over 4 hours.

3.2.2 Load Duration Curve

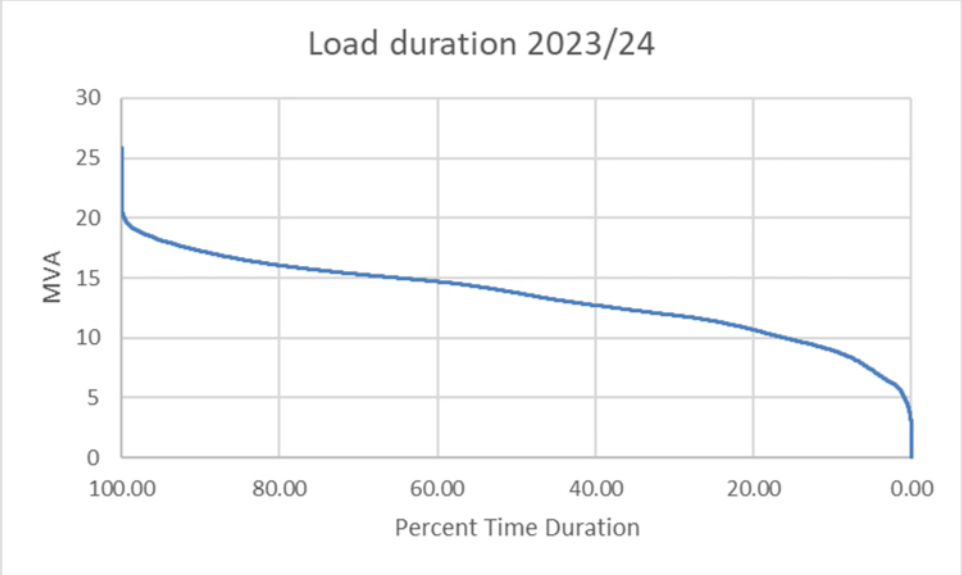


Figure 5 – Load duration curve of the combined load at SSGBN, SSTCB and SSTLF

3.3 Counterfactual analysis

The counterfactual scenario is to continue maintain and operate the network as it is currently designed without further augmentation.

3.3.1 Value Streams

Energex broadly considers five value streams for investment. These are shown in Figure 6. The two value streams that are relevant to this business case are *reliability*.

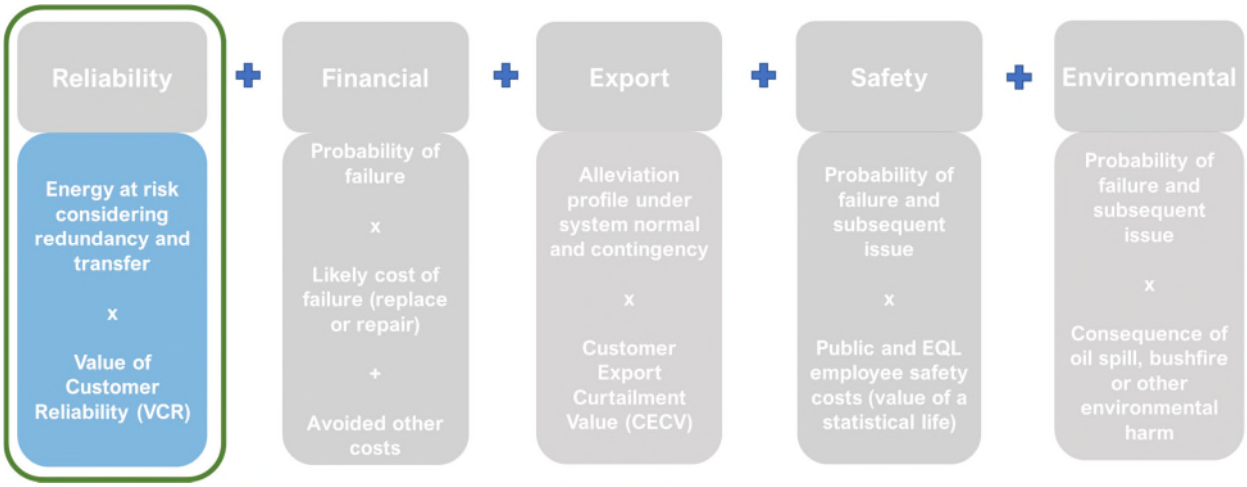


Figure 6 – Value Streams for Investment

- **Reliability:** There is potential unserved energy following an outage of F429, the remaining feeder F341 is unable to supply the full load.

3.3.2 Risk Quantifications

The counterfactual risk is an outage of the feeder F429, resulting in loss of supply to customers. In calculating the VCR implications of the existing network, the following assumptions have been used:

- **F429 Outage rate** – 1.5344 outages / year. This is a long overhead feeder, with vegetations along the line route.
- **Restoration** – following an outage, it has been estimated that the rectification of the outage would be 6 hours.
- **Transfers** – all available transfers via switching have been considered.
- **VCR Rate** – a VCR rate of $63.4/kWh has been used, calculated according to the weighting of energy supplied to the domestic, commercial, industrial and agricultural customers in the area.

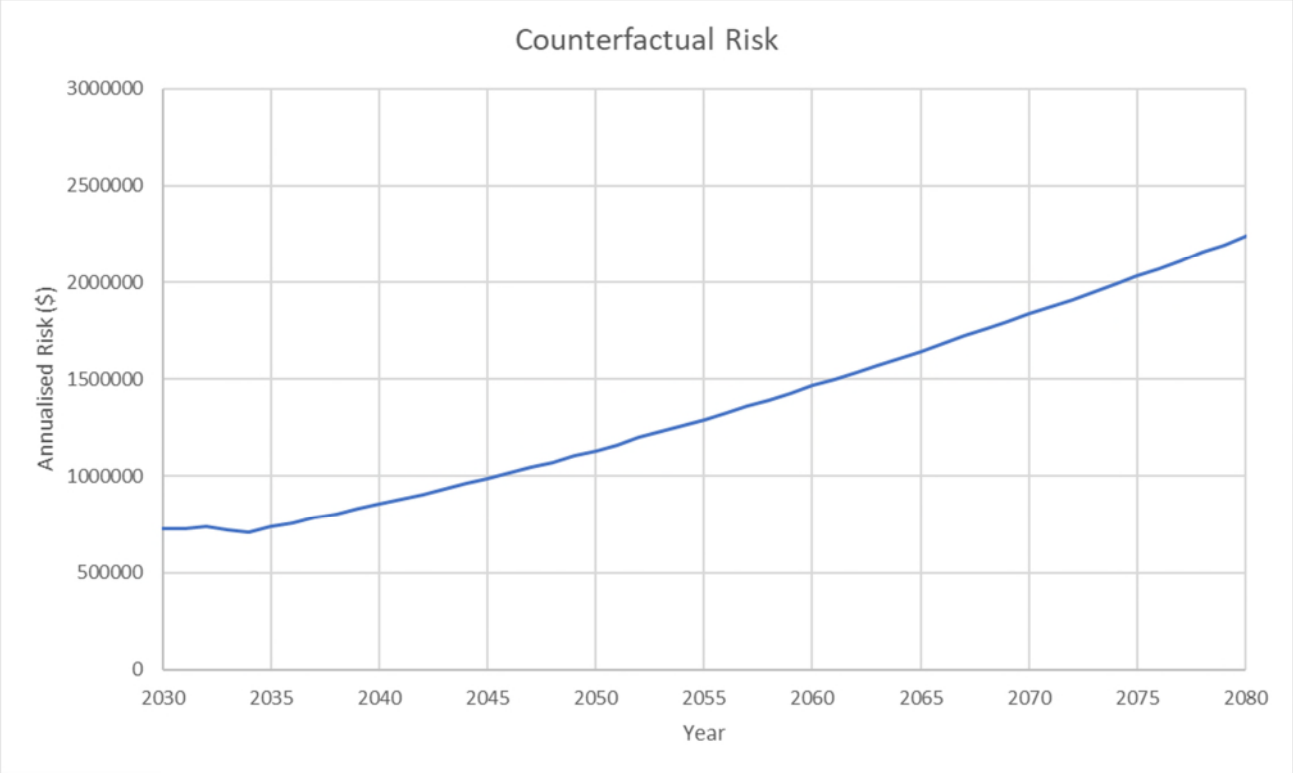


Figure 7 – Counterfactual Risk

4 OPTIONS ANALYSIS

In determining the most cost-effective solution to address the identified network limitations, Energex has sought to identify a practicable range of technically feasible, alternative options that could satisfy the network requirements in a timely and efficient manner.

4.1 Option 1 – Reconductor 26kms of 33kV feeder 341-1 from SST8 to P38682-A with Pluto

This option will help in permanently providing additional feeder capacity to address the feeder limitation which involves Safety Net breaches on F341-1.

The works under this option involves:

- Reconductor approximately 26km feeder F341-1 from SST8 to P38682-A with Pluto.
- Replace 29 x ageing timber cross arms as per Table 1 below.
- Replace 62 x ageing timer poles as per Table 2 below.
- Revise feeder F429 and F341 primary and backup protection.
- Revise feeder overcurrent protection settings on F429 and F341 to avoid load encroachment.

The network requirement date for the above work is 2028/29. Figure 8 shows the network arrangement and Figure 9 shows the geographic layout for option 1. Table 1 details the 29 x ageing timber cross arms to be replaced and Table 2 details the 62 x ageing timer poles to be replaced.

Note: After reconductoring feeder 341-1 with Pluto; for the loss of feeder 429 during winter, all the load at SSTLF and up to 3.5MVA load at SSTCB can be supplied by F341-1. The remaining SSTCB load will have to be shed due to the voltage constraint at SSTCB. The shed load can be supplied by mobile generation. This complies with Energex's Safety Net guidelines.

4.1.1 Costs

The reconductoring of 26kms of 33kV feeder 341-1 from SST8 to P38682-A with Pluto has been estimated at $5.718m direct cost, which has been factored into the NPV as a cost in 2029.

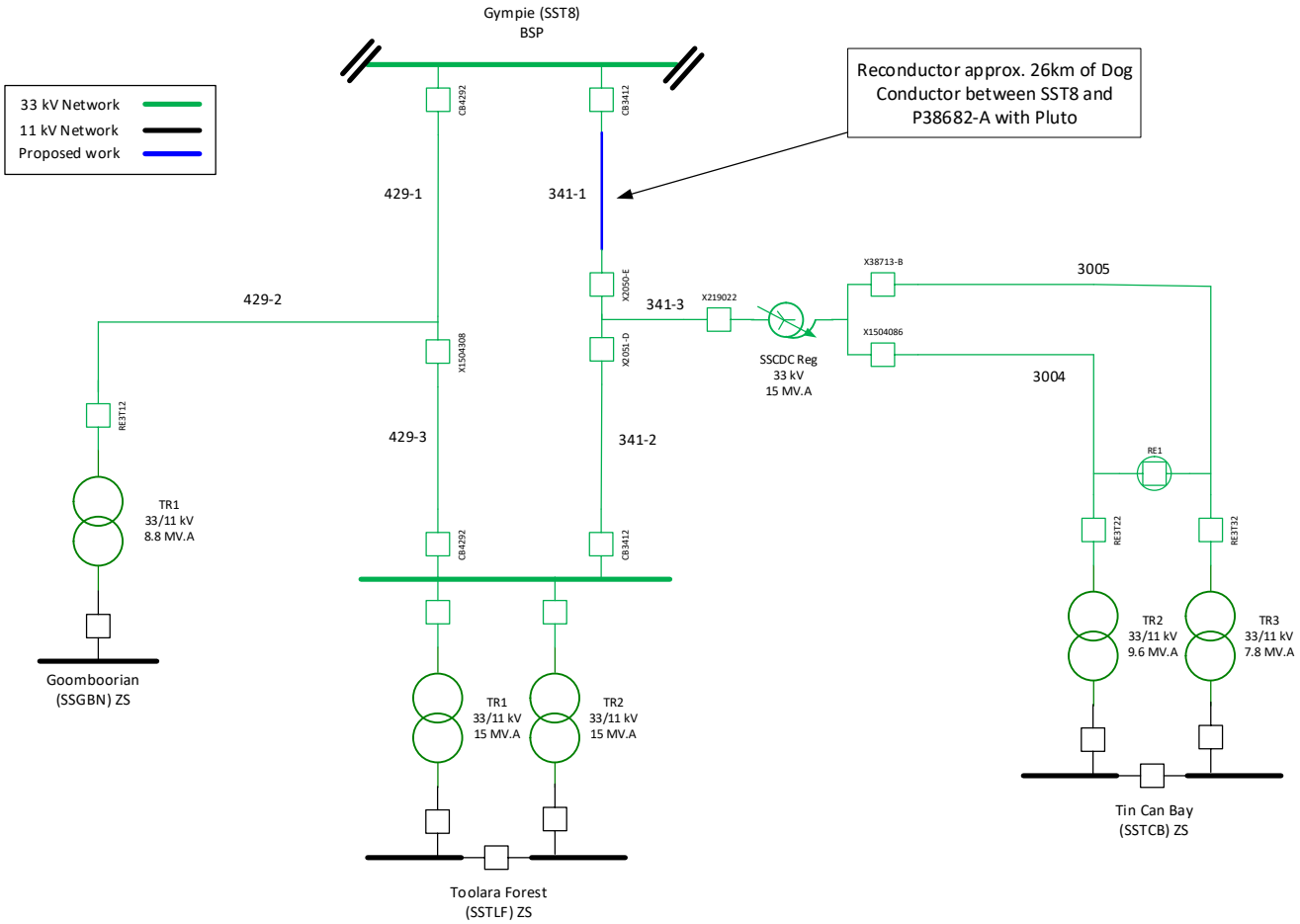


Figure 8 – Option 1 network diagram

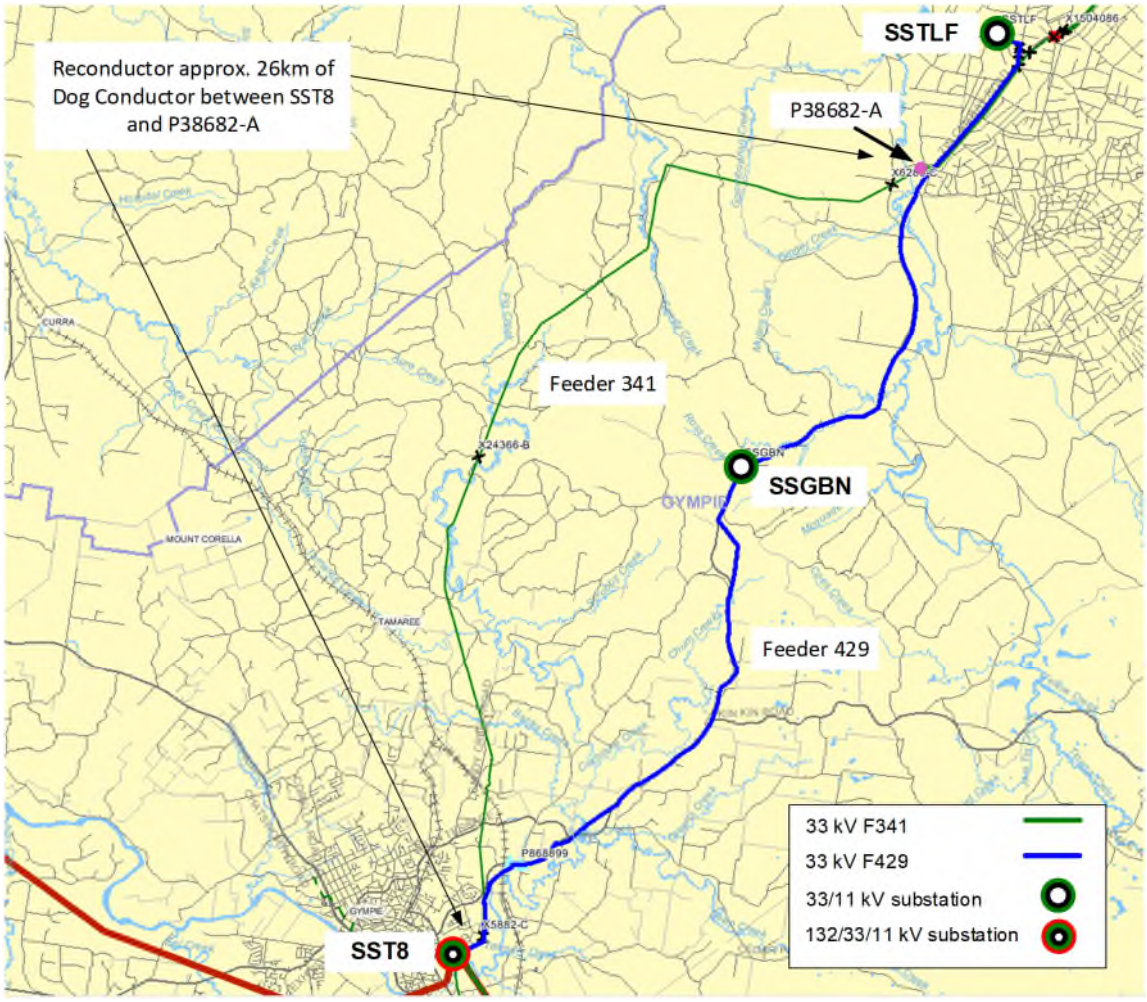


Figure 9 – Option 1 network arrangement (geographic view)

Site Reference ID	Crossarm Construction Type	Crossarm Material Type	Voltage Level ID	Pole Material	Pole Species	Pole Install Date	Priority Band
P48796-A	Shackle	Wood	33	Wood	SPOT GUM	01/10/1964	Orange
P48999-B	Wishbone	Wood	33	Wood	SPOT GUM	01/10/1964	Orange
P49000-B	Wishbone	Wood	33	Wood	SPOT GUM	01/10/1964	Orange
P48720-A	Wishbone	Wood	33	Wood	SPOT GUM	01/08/1964	Orange
P48716-A	Wishbone	Wood	33	Wood	SPOT GUM	08/04/1992	Orange
P48706-A	Wishbone	Wood	33	Wood	SPOT GUM	01/08/1964	Orange
P51243-A	Wishbone	Wood	33	Wood	SPOT GUM	01/10/1964	Orange
P38679-B	Wishbone	Wood	33	Wood	SPOT GUM	01/11/1964	Orange
P48762-A	Wishbone	Wood	33	Wood	SPOT GUM	01/10/1964	Orange
P48763-A	Wishbone	Wood	33	Wood	SPOT GUM	01/01/1982	Orange
X24366-B	Shackle	Wood	33	Wood	SPOT GUM	09/02/2012	Orange
P48739-A	Wishbone	Wood	33	Wood	SPOT GUM	01/09/1964	Orange
P48744-A	Wishbone	Wood	33	Wood	SPOT GUM	01/09/1964	Orange
P48746-A	Wishbone	Wood	33	Wood	BLACKBUTT	01/09/1964	Orange
P48753-A	Wishbone	Wood	33	Wood	SPOT GUM	01/10/1964	Orange
P48755-A	Pin	Wood	33	Wood	GREY IBARK	01/10/1964	Orange
P48756-A	Wishbone	Wood	33	Wood	SPOT GUM	01/10/1964	Orange
P48757-A	Wishbone	Wood	33	Wood	SPOT GUM	01/10/1964	Orange
P48758-A	Wishbone	Wood	33	Wood	SPOT GUM	01/10/1964	Orange
P48760-A	Shackle	Wood	33	Wood	IRON BARK	20/06/1973	Orange
SP3827-B	Shackle	Wood	33	Wood	B/LF RD IB	15/09/1993	Orange
P48767-A	Wishbone	Wood	33	Wood	GYM MSMATE	01/10/1964	Orange
P48768-A	Wishbone	Wood	33	Wood	SPOT GUM	01/10/1964	Orange
P48793-A	Wishbone	Wood	33	Wood	B/LF RD IB	01/05/1995	Orange
P48725-A	Wishbone	Wood	33	Wood	GREY BOX	01/09/1964	Orange
P48730-A	Wishbone	Wood	33	Wood	BLACKBUTT	01/09/1964	Orange
P219327	Pin	Wood	33	Wood	B/LF RD IB	19/12/1989	Orange
P48722-A	Pin	Wood	33	Wood	SPOT GUM	01/08/1964	Orange
SP11768-A	Pin	Wood	33	Wood	GREY IBARK	01/08/1964	Orange

Table 1: Crossarms Priority Equipment Details

Feeder ID	Site Reference ID	Maximum Operating Voltage	Pole Material	Pole Species	Pole Strength	Nailed Ind	Install Date	Age (Years)	Priority Band
341	P48985-A	33	Wood	GREY IBARK	143	NO	01/10/1964	60	Red
341	P48986-B	33	Wood	SPOT GUM		YES	01/10/1964	60	Red
341	SP48987-A	33	Wood	BLACKBUTT	145	NO	01/10/1964	60	Red
341	ST48989-E	33	Wood	Unknown	163	NO	01/10/1964	60	Red
341	P48790-A	33	Wood	SPOT GUM	132	NO	01/10/1964	60	Red
341	P48791-A	33	Wood	SPOT GUM	258	NO	01/10/1964	60	Red
341	P48796-A	33	Wood	SPOT GUM	234	NO	01/10/1964	60	Red
341	P48797-A	33	Wood	SPOT GUM	244	NO	01/10/1964	60	Red
341	P48995-B	33	Wood	SPOT GUM		NO	01/10/1964	60	Red
341	P48998-B	33	Wood	SPOT GUM	163	NO	01/10/1964	60	Red
341	P48999-B	33	Wood	SPOT GUM	148	NO	01/10/1964	60	Red
341	P49000-B	33	Wood	SPOT GUM	214	NO	01/10/1964	60	Red
341	P48720-A	33	Wood	SPOT GUM	163	NO	01/08/1964	60	Red
341	P48714-A	33	Wood	SPOT GUM	199	NO	01/08/1964	60	Red
341	P48718-A	33	Wood	SPOT GUM	213	NO	01/08/1964	60	Red
341	P48713-A	33	Wood	Unknown	201	NO	01/08/1964	60	Red
341	P48706-A	33	Wood	SPOT GUM	169	NO	01/08/1964	60	Red
341	X1745-M	33	Wood	SPOT GUM	104	NO	01/01/1963	62	Red
341	X5882-C	33	Wood	SPOT GUM	294	NO	01/08/1964	60	Red
341	P48711-A	33	Wood	SPOT GUM	215	NO	01/08/1964	60	Red
341	P38681-B	33	Wood	SPOT GUM	305	NO	01/11/1964	60	Red
341	P38679-B	33	Wood	SPOT GUM	106	NO	01/11/1964	60	Red
341	P38680-B	33	Wood	SPOT GUM	120	NO	01/11/1964	60	Red
341	P48762-A	33	Wood	SPOT GUM		YES	01/10/1964	60	Red
341	SP16851-B	33	Wood	SPOT GUM	112	YES	01/10/1964	60	Red
341	X48769-A	33	Wood	SPOT GUM		NO	01/10/1964	60	Red
341	P48783-A	33	Wood	SPOT GUM	107	NO	01/10/1964	60	Red
341	ST48778-A	33	Wood	SPOT GUM	141	NO	01/10/1964	60	Red
341	ST48780	33	Wood	SPOT GUM	111	NO	01/10/1964	60	Red
341	SP48759-A	33	Wood	GREY BOX		NO	01/10/1964	60	Red
341	P48738-A	33	Wood	RED GUM	147	NO	01/09/1964	60	Red
341	P48739-A	33	Wood	SPOT GUM		NO	01/09/1964	60	Red
341	P48740-A	33	Wood	RED IB		NO	04/09/1964	60	Red
341	P48741-A	33	Wood	SPOT GUM	151	NO	01/09/1964	60	Red
341	P48742-A	33	Wood	BLACKBUTT		NO	01/09/1964	60	Red
341	P48744-A	33	Wood	SPOT GUM	135	NO	01/09/1964	60	Red
341	P48745-A	33	Wood	WH S/BARK	111	NO	01/09/1964	60	Red
341	P48746-A	33	Wood	BLACKBUTT		NO	01/09/1964	60	Red
341	P48747-A	33	Wood	RED IB		NO	01/09/1964	60	Red
341	P48750-A	33	Wood	GREY BOX		NO	01/01/1966	59	Orange
341	P48752-A	33	Wood	SPOT GUM		YES	01/10/1964	60	Red
341	P48754-A	33	Wood	GREY BOX		NO	01/10/1964	60	Red
341	P48755-A	33	Wood	GREY IBARK		NO	01/10/1964	60	Red
341	P48756-A	33	Wood	SPOT GUM	125	NO	01/10/1964	60	Red
341	P48757-A	33	Wood	SPOT GUM	112	NO	01/10/1964	60	Red
341	P48758-A	33	Wood	SPOT GUM		NO	01/10/1964	60	Red
341	P48784-A	33	Wood	SPOT GUM	152	NO	01/10/1964	60	Red
341	P48786-A	33	Wood	SPOT GUM	132	NO	01/10/1964	60	Red
341	P48788-A	33	Wood	BLACKBUTT		NO	01/10/1964	60	Red
341	P48766-A	33	Wood	SPOT GUM	104	NO	01/10/1964	60	Red
341	P48767-A	33	Wood	GYM MSMATE		NO	01/10/1964	60	Red
341	P48768-A	33	Wood	SPOT GUM		NO	01/10/1964	60	Red
341	P48735-A	33	Wood	SPOT GUM	176	NO	01/09/1964	60	Red
341	P48794-A	33	Wood	GREY IBARK		NO	01/10/1964	60	Red
341	P48733-A	33	Wood	SPOT GUM	126	NO	01/09/1964	60	Red
341	P48725-A	33	Wood	GREY BOX	138	NO	01/09/1964	60	Red
341	P48726-A	33	Wood	SPOT GUM	137	NO	01/09/1964	60	Red
341	P48732-A	33	Wood	SPOT GUM	159	NO	01/09/1964	60	Red
341	P48730-A	33	Wood	BLACKBUTT		NO	01/09/1964	60	Red
341	P48731-A	33	Wood	SPOT GUM	325	NO	01/09/1964	60	Red
341	P48721-A	33	Wood	SPOT GUM	108	NO	01/08/1964	60	Red
341	P48724-A	33	Wood	RED IB		NO	01/08/1964	60	Red

Table 2: Poles Priority Equipment Details

4.2 Option 2 - Rebuild 33kV feeder 341 as double circuit and install 33kV switchgear modular building and recover existing outdoor 33kV switchgear.

This option will help in permanently providing additional feeder capacity to address the feeder limitation which involves Safety Net breaches on F341-1. As the existing 33kV bus at Toolara Forest substation cannot be extended, new indoor 33kV switchgear will have to be built to connect the proposed new feeder.

The works under this option involve:

- Install 33kV switchgear building (prefabricated or equivalent) consisting of 2 x transformer CBs, 8 x feeder CBs and 1 x bus section CB.
- Recover 4 x outdoor 33kV for spares.
- Rebuild existing 33kV feeder 341-1 & 341-2 (approximately 30kms) as a double circuit feeder.

Figure 10 shows the network arrangement for option 2.

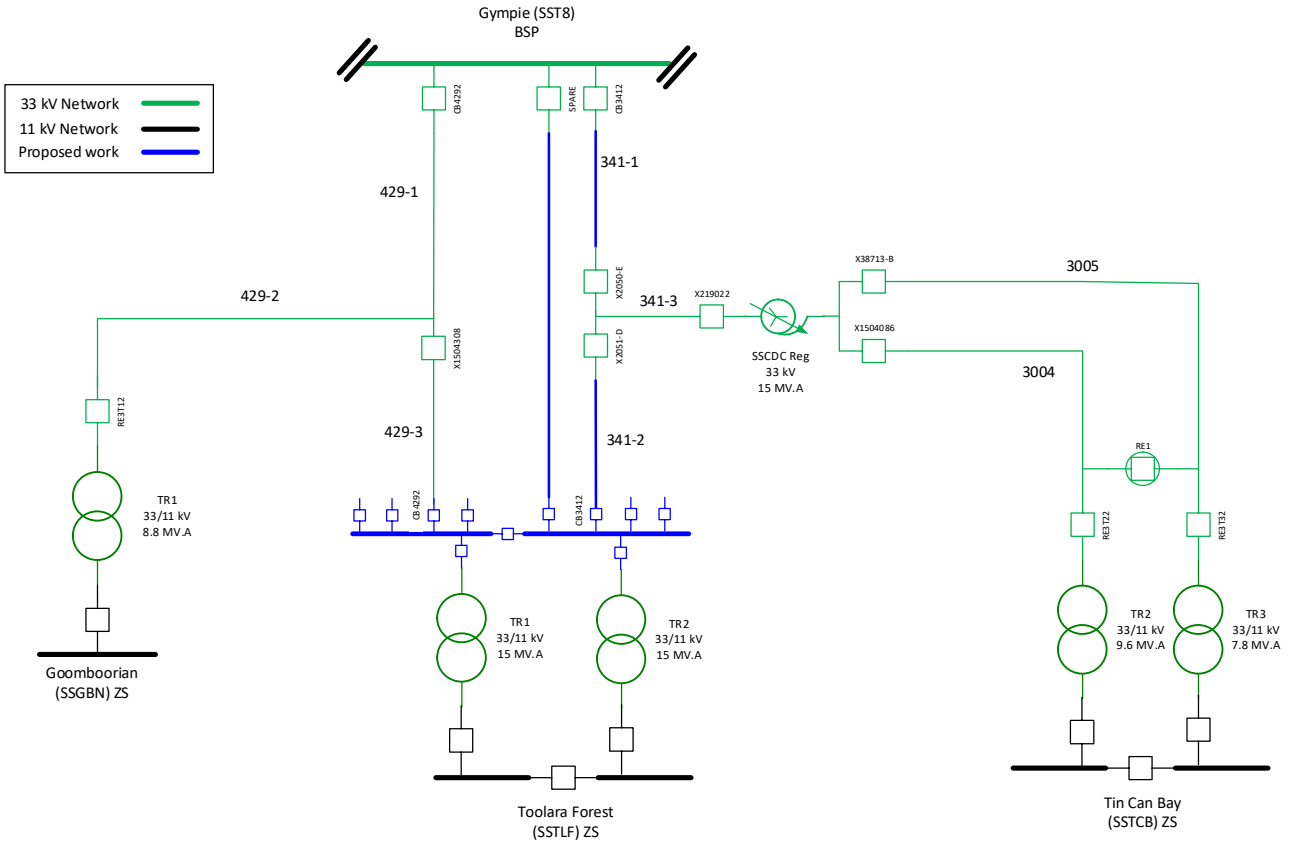


Figure 10 – Option 2 network diagram

4.2.1 Costs

The rebuild of 33kV feeder 341 as double circuit feeder and install 33kV switchgear building has been estimated at $43.239m direct cost, which has been factored into the NPV as a cost in 2029.

4.3 Economic Analysis

4.3.1 Cost summary 2025-30

The reconductor 26kms of 33kV feeder 341-1 from SST8 to P38682-A with Pluto has been estimated as $5.718m. The forecast expenditure by year is shown in Table 3.

Table 3 – Cost summary 2025-30

Option	2025-26	2026-27	2027-28	2028-29	2029-30	Total 2025-30
Reconductor 26kms of 33kV feeder 341-1 from SST8 to P38682-A with Pluto	$0.0m	$0.581m	$1.389m	$2.411m	$1.337m	**$5.718m**

4.3.2 NPV analysis

From the table below, Option 1 is the lowest cost option. The NPV under the base case is $17.410m, with the Capex, Opex and Benefits NPV shown in Table 4. Table **5** shows the results after completing a sensitivity analysis having changed various inputs in the financial model. Under all models Option 1 is the preferred option.

Table 4 – Base Case NPV analysis

Option	Rank	Net NPV	Capex NPV	Opex NPV	Benefits NPV
Reconductor 26kms of 33kV feeder 341-1 from SST8 to P38682-A with Pluto	1	$17.410m	-$4.652m	-$1.112m	$23.174m
Rebuild 33kV feeder 341 as double circuit and install 33kV switchgear modular building and recover outdoor 33kV switchgear	2	-$14.615m	-$35.175m	-$2.614m	$23.174m

Table 5 – NPV Sensitivity Analysis

Option	Discount rate	
	2.5%	**4.5%**
Reconductor 26kms of 33kV feeder 341-1 from SST8 to P38682-A with Pluto	$25.146m	$12.215m
Rebuild 33kV feeder 341 as double circuit and install 33kV switchgear building and recover outdoor 33kV switchgear.	-$9.139m	-$17.792m

4.4 Delivery Timeframe

This is a Safety Net requirement; due to the late identification of the network limitation it is anticipated that the earliest completion of this project is in 2029.

5 RECOMMENDATION

It is recommended to reconductor 26kms of 33kV feeder 341-1 from SST8 to P38682-A with Pluto enabling Energex to meet the Safety Net regulatory obligation. Table 6 summarises the option under consideration.

Table 6 Options Analysis Scorecard

Criteria	Option 1 – Reconductor 26kms of 33kV feeder 341-1 from SST8 to P38682-A with Pluto	Option 2 – Rebuild 33kV feeder 341 as double circuit and install 33kV switchgear modular building and recover outdoor 33kV switchgear.
Net Present Value	$17.410m	-$14.615m
Investment cost	$5.718m	$43.239m
Investment Risk	Medium	Medium
Delivery time	4 years	6 years
Detailed analysis – Risks	Outage timing to be considered to manage risks with reduced security during construction.	Energex will have to acquire DCCT easement for F341 which might be difficult to obtain.
Detailed analysis - Advantages	Better utilises available capacity on 33kV network between SSTLF and SSTCB.	Improved reliability and security for SSTLF and SSTCB.

APPENDICES

Appendix 1: Alignment with the National Electricity Rules

Table 7 Recommended Option's Alignment with the National Electricity Rules

NER capital expenditure objectives	Rationale
A building block proposal must include the total forecast capital expenditure which the DNSP considers is required in order to achieve each of the following (the capital expenditure objectives):	
6.5.7 (a) (1) meet or manage the expected demand for standard control services over that period	Section 3, Section 4.1
6.5.7 (a) (2) comply with all applicable regulatory obligations or requirements associated with the provision of standard control services;	Section 3, Section 4.1
6.5.7 (a) (3) to the extent that there is no applicable regulatory obligation or requirement in relation to: (i) the quality, reliability or security of supply of standard control services; or (ii) the reliability or security of the distribution system through the supply of standard control services, to the relevant extent: (iii) maintain the quality, reliability and security of supply of standard control services; and (iv) maintain the reliability and security of the distribution system through the supply of standard control services	Section 3, Section 4.1
6.5.7 (a) (4) maintain the safety of the distribution system through the supply of standard control services.	Section 3, Section 4.1
NER capital expenditure criteria	**Rationale**
The AER must be satisfied that the forecast capital expenditure reflects each of the following:	
6.5.7 (c) (1) (i) the efficient costs of achieving the capital expenditure objectives	Section 4.3
6.5.7 (c) (1) (ii) the costs that a prudent operator would require to achieve the capital expenditure objectives	Section 4.3
6.5.7 (c) (1) (iii) a realistic expectation of the demand forecast and cost inputs required to achieve the capital expenditure objectives	Section 3, Section 4.3

Appendix 2: Reconciliation Table

Table 8 Reconciliation

Expenditure	2025-26	2026-27	2027-28	2028-29	2029-30	2025-30
Expenditure in business case $m, direct 2022-23	$0.0m	$0.581m	$1.389m	$2.411m	$1.337m	**$5.718m**