

# Powerline Bushfire Safety Committee

December 2019

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missionzero

# Agenda



## ▶ REFCL

1. REFCLs in Service
2. Tranche 1 Compliance Update
3. Tranche 1 Roadmap
4. Tranche 2 HV Customer Readiness
5. Tranche 2 Roadmap
6. Tranche 3 Update

## ▶ Other bushfire mitigation programs

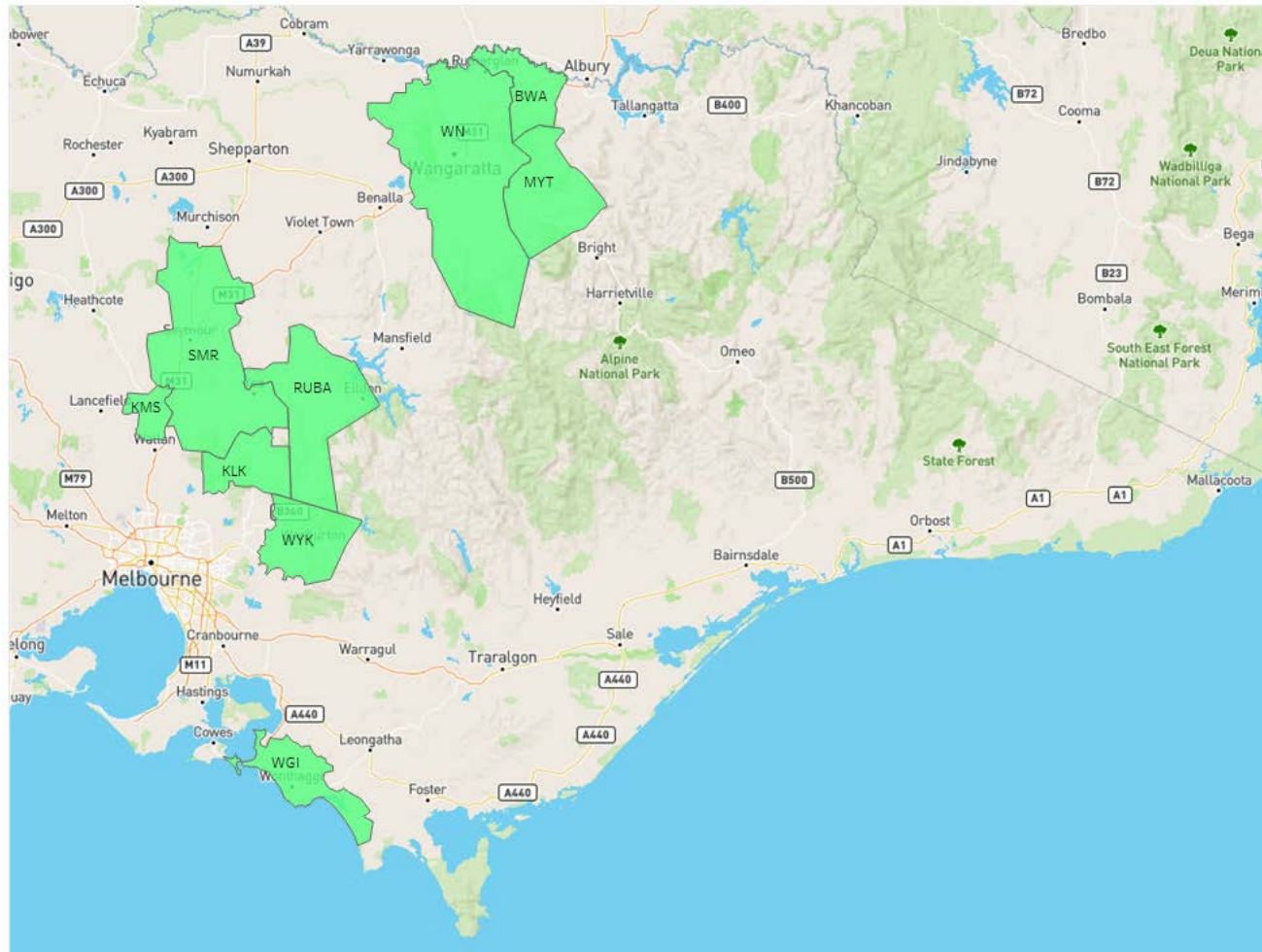
7. ACR Program
8. Powerline Replacement
9. Codified Areas

## ▶ Appendix - REFCL Program Overview

# 1. REFCLs in service



► REFCLs are in service at 9 zone substations with Wonthaggi (WGI) being placed in service on 27 November 2019



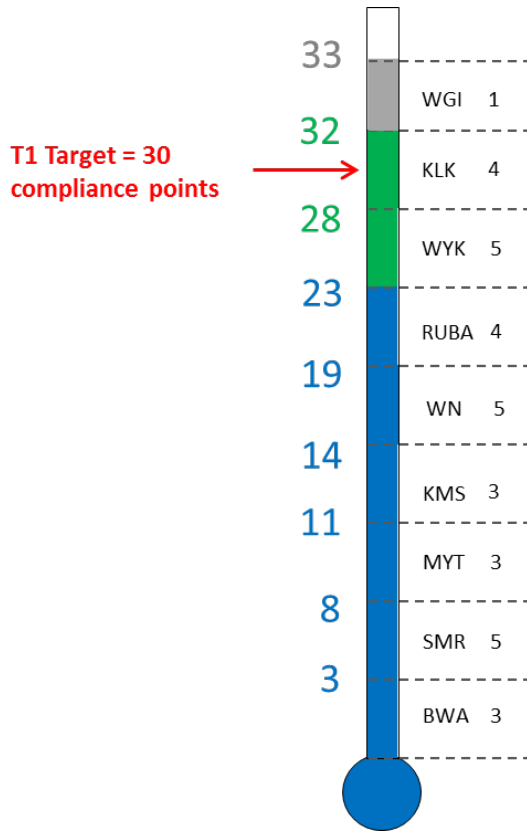
► On 21 November 2019, a Total Fire Ban (TFB) day was declared across the entire State. All 8 Tranche 1 REFCLs were in service at set point 1

- › 3 permanent earth faults occurred on WYK, KMS & RUBA
- › 3 transient earth faults occurred on SMR & KLK
- › No REFCL faults on BWA, WN & MYT
- › Phase to phase faults were experienced at WYK, KLK & SMR

► On 25 November 2019, a TFB day was declared in the Northern Country. The WN and SMR REFCLs operated in set point 1

- › No permanent and transient faults were recorded

# 2. Tranche 1 Compliance Update



- ▶ **Time extensions for WYK & KLK were granted by the Director of ESV on 21 November 2019**
  - › WYK – 1 November 2020
  - › KLK – 29 April 2021
- ▶ **Conditional compliance period extended to 31 December 2019**
  - › Ground Fault Neutraliser (GFN) firmware at all zone substations is being upgraded to SVN538 which was received from Swedish Neutral on 14 November 2019 to address the inverter calibration and delta admittance

Legend	
	Conditional compliance
	Extension of time granted
	In service

ZSS	Points	# of Feeders	Conditional Compliance Achieved	Complying Zone substation	Conditions						
					Calibration	Delta Admittance	Harmonics	Damping	Inverter Tripping	Update Verification Methodology	Annual testing
Barnawartha	3	4	Yes	Yes	O ✓	O ✓	-	-	-	-	O ✓
Myrtleford	3	4	Yes	Yes	O ✓	-	-	-	-	O ✓	O n/a for 2019
Kilmore South	3	2	Yes	Yes	O ✓	O ✓	-	-	-	-	O n/a for 2019
Seymour	5	6	Yes	Yes	O ✓	O ✓	O ✓	-	O ✓	-	O n/a for 2019
Wangaratta	5	7	Yes	Yes	O ✓	O ✓	-	-	-	O ✓	O n/a for 2019
Rubicon A	4	5	Yes	Yes	O ✓	O ✓	O ✓	-	-	O ✓	O n/a for 2019

Legend: O = condition applies    - = condition does not apply    ✓ = resolution accepted by ESV    ✓ = evidence provided to ESV that condition has been met

## 2.1 Tranche 1 Compliance

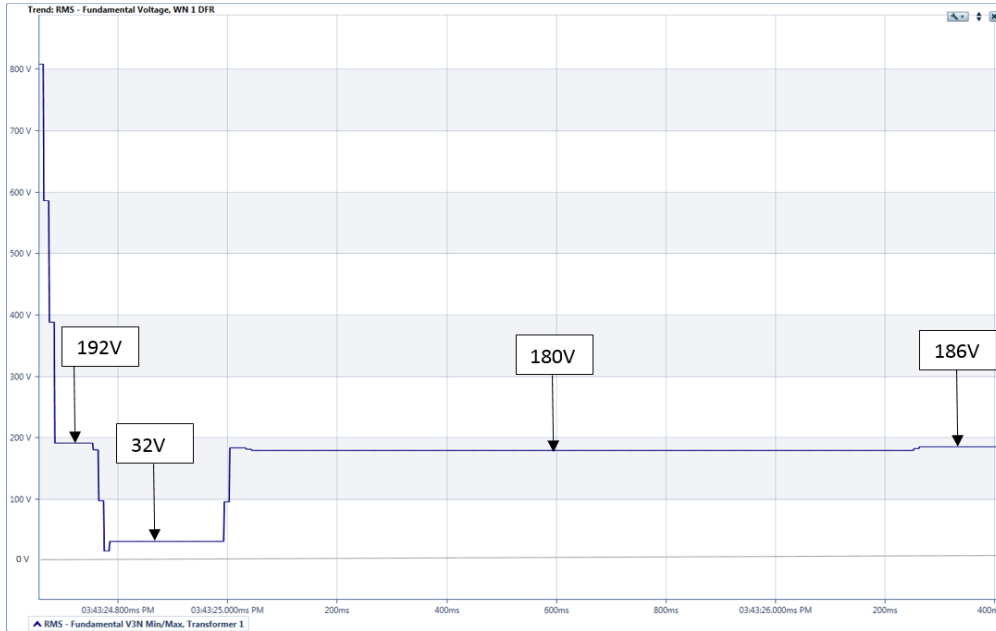
### GFN firmware versions performance



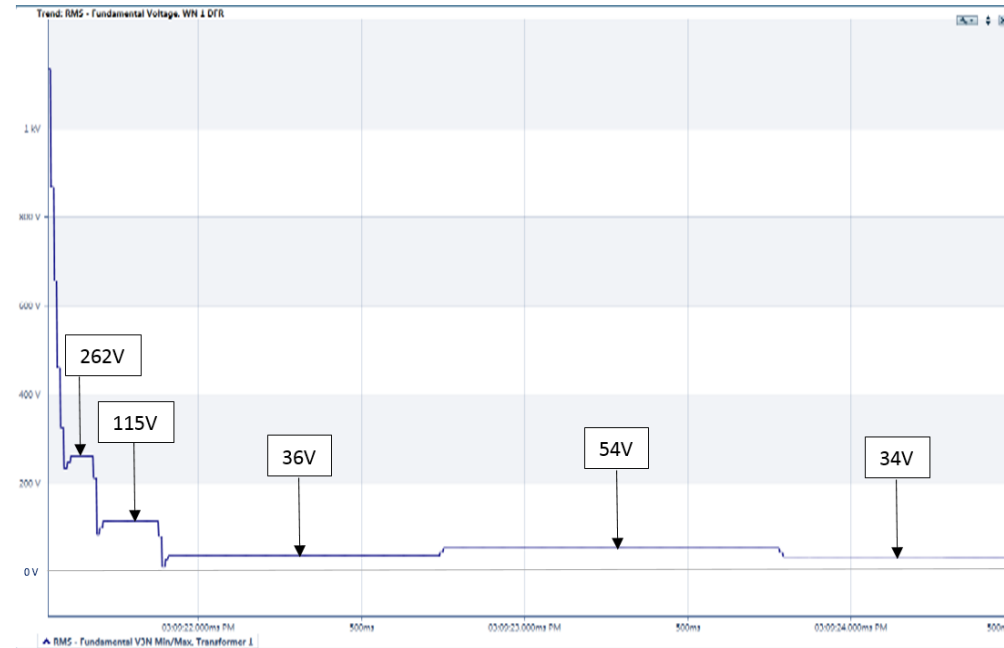
Firmware version	Status	Release Date	Zone substations Tested (PEF) / firmware installed	Performance with respect to compliance		Other issues identified
				Inverter calibration	Delta admittance	
SVN511	Full Release	01/10/2018	All T1 ZSSs	Poor	Poor	- Split Bus not available due to firmware issue
SVN526	Beta	04/07/2019	BWA KLK	Poor	Good	- ASC confirmation calculation issue - GFN self reboot during faults - Increase in fault confirmation time affecting I <sup>2</sup> t
SVN529	Beta	30/08/2019	WYK	Poor	Good	- Increase in fault confirmation time affecting I <sup>2</sup> t
SVN531	Full Release	26/09/2019	WGI	Poor	Good	- As per SVN529
SVN536	Beta	23/10/2019	WGI	Poor	Good	- As per SVN529 - Unwanted inverter trips
SVN537	Beta	24/10/2019	-	Poor	Good	
SVN537	Full Release	9/11/2019	WN	Poor	Good	- Inverter compensation notching issue
SVN538	Beta	14/11/2019	All T1 ZSSs and WGI	Good	Good	- I <sup>2</sup> t slightly more challenging on long feeders

# 2.2 Tranche 1 Compliance

## Bus Bar tuning - SVN537 versus SVN538



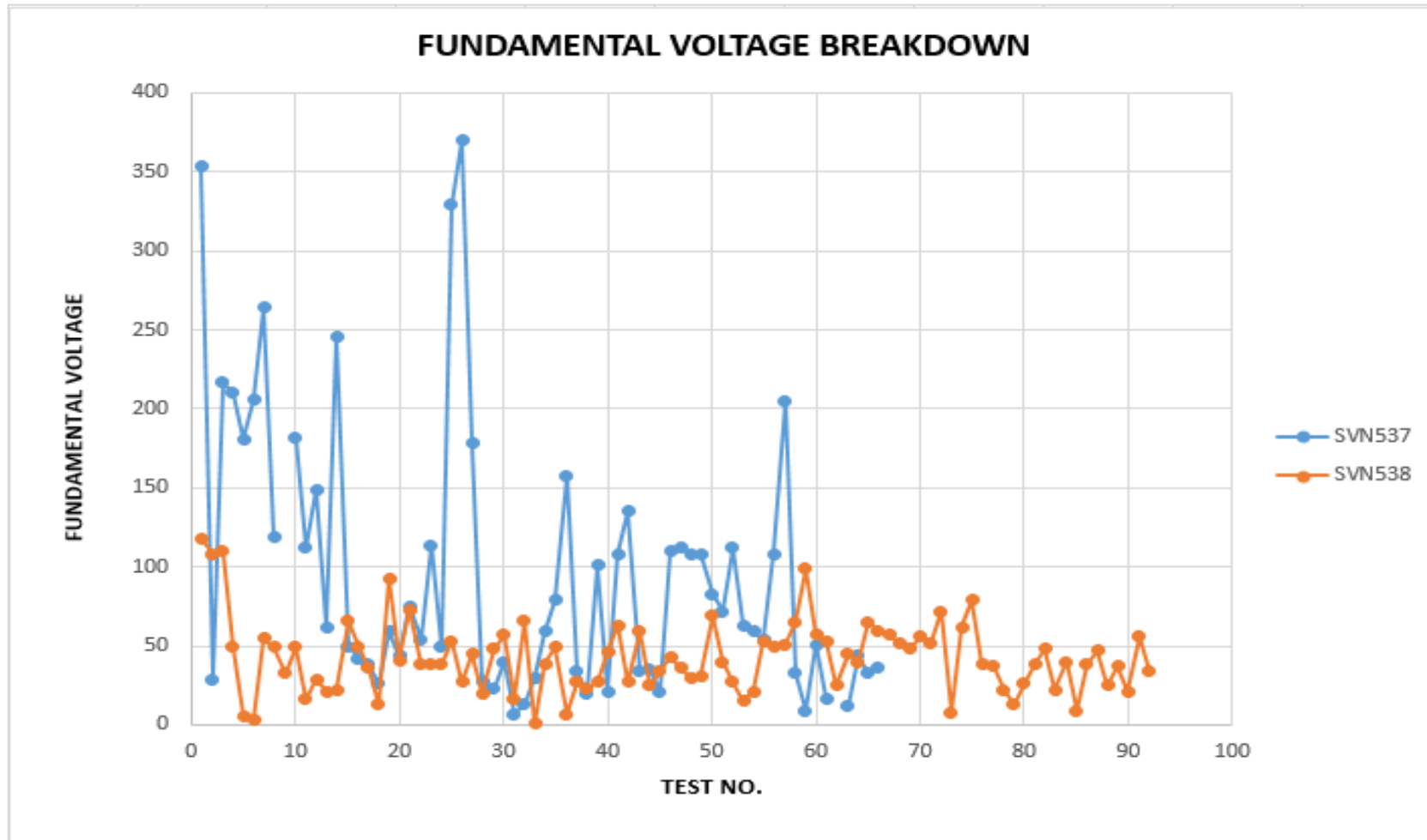
SVN537



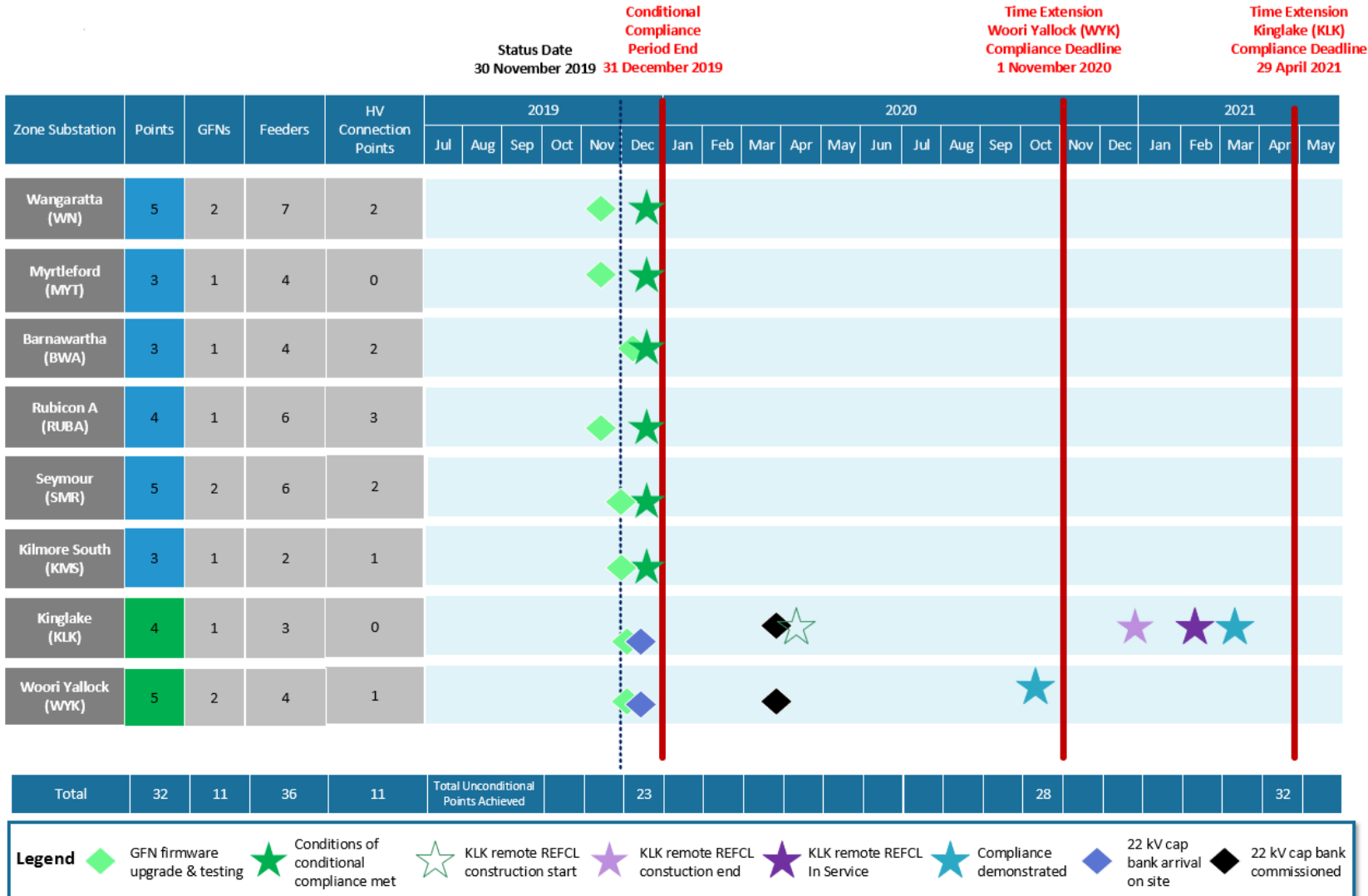
SVN538

## 2.3 Tranche 1 Compliance

### Fundamental voltage collapse - SVN537 versus SVN538



# 3. REFCL Tranche 1 Roadmap



**Key messages:**

- Latest Swedish Neutral firmware upgrade to all sites by 31 December 2019: **On track**
- Design of remote REFCL on KLK11: **On track**
- Commissioning of new capacitor banks at Woori Yallock & Kinglake zone substations in March 2020 : **On track**
- Options to isolation of capacitance on WYK13 currently being scoped



## 4. Tranche 2 HV Customer Readiness Metro Trains Melbourne (MTM) Update



► **On 19 November 2019, MTM provided their committed delivery dates for their impacted HV connection points following the receipt of their preferred contractors program**

- › Due to funding and planning issues with local council, the Montmorency delivery date can not be confirmed at this time

ZSS	Points	MTM Connections	REFCL Readiness Date	MTM Readiness Date	Time Extension Date
Belgrave (BGE)	3	Upwey	30 April 2020	30 November 2021	1 May 2022
Ferntree Gully (FGY)	2	Ferntree Gully	31 May 2020	31 October 2021	1 May 2022
Lilydale (LDL)	3	Lilydale Mooroolbark	31 July 2020	31 July 2021	1 May 2022
Eltham (ELM)	2	Eltham Wattle Glen Montmorency	30 June 2020	30 April 2022 30 June 2022 TBC	1 May 2023

► **We continue to work closely with MTM to provide support and assistance with their REFCL readiness activities**

- › The permanent transfer of Mooroolbark from LDL to Croydon (CYN), a non REFCL network, was identified earlier this year and is being progressed
- › A temporary transfer of Upwey from BGE to FGY to enable the BGE REFCLs to be placed in service appears to be feasible and is being progressed



## 6. REFCL Tranche 3 Update



- ▶ **AER published their Tranche 3 contingent project application decision on 3 October 2019**
  
- ▶ **AER did not approve the full amount of requested expenditure for Kalkallo (KLO) as the proposed solution required technical exemptions to be approved**
  - › Revised expenditure can be proposed as part of the 2021-2026 Electricity Distribution Price Review (EDPR) process
  - › AN alternative solution to building a new zone substation at KLO North is to utilise remote REFCLs
  - › A technical exemption request is being prepared
  
- ▶ **The CSIRO have been engaged to prepare an assessment of bushfire risk on the KLO network as part of the technical exemption preparation process**

# 7. ACR Program



## ➤ Completed December 2015

Fire Consequence Level	# Devices Highest Risk Areas	# Devices Remaining Risk Areas
TFB/Code Red	165	900

## 8. Powerline Replacement

### Powerline Replacement Fund (PRF)

- 1,680km in 'codified' areas
- 147km replaced; cost \$70.9M
- 23.6km in progress; cost \$11.8M
- Scheduled completion Mar 2020
  - Completion date extended due to cultural heritage management plan activities and inspections as well as wet conditions preventing access to a number of sites

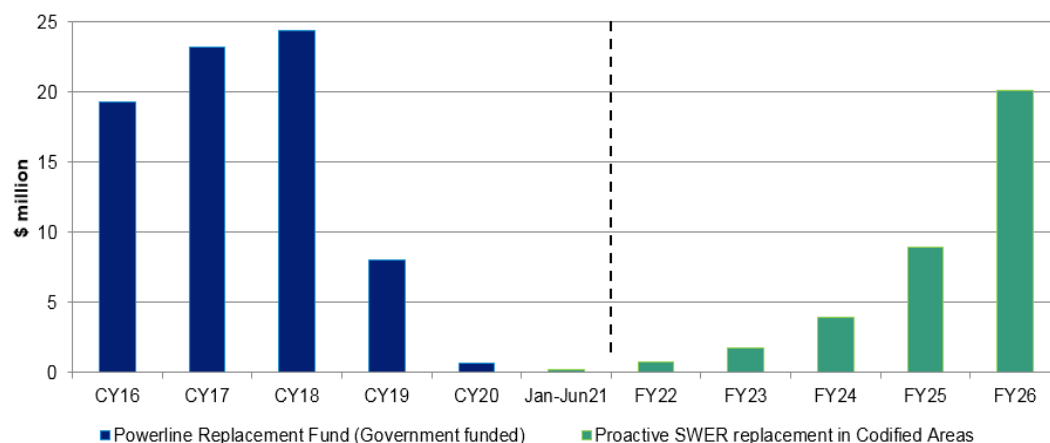
### AusNet Services' Program

- Conductor condition good
- Risk Based Modelling
  - Vegetation
  - Reliability
- No contingent projects identified
- ~\$500-600M investment

## 9. Codified Areas

- ▶ Our EDPR proposal includes a SWER replacement program (with a forecast cost of \$35.5 million (direct, \$2021)), to continue the work carried out during the current period under the PRF program

Powerline Replacement Fund expenditure and the proposed Codified Areas SWER  
Powerline Replacement Program, direct capex (\$m, 2021)



- › We are proposing to replace approximately 110km (17%) of the 660km of SWER network in Codified Areas over the regulatory period with insulated overhead conductors (70%) or undergrounding (30%)

- › Based on the condition of some of our conductors, as well as the safety risk presented by our assets, we are also proposing to undertake replacements of around \$5.5 million (direct, \$2021)
- › Our proposal will make a significant contribution to our ongoing plan to replace the bare conductors remaining within Codified Areas

# Appendix



# Appendix - REFCL Program Overview

## As at 30 November 2019

