

# PBSC UPDATE Powercor REFCL Program



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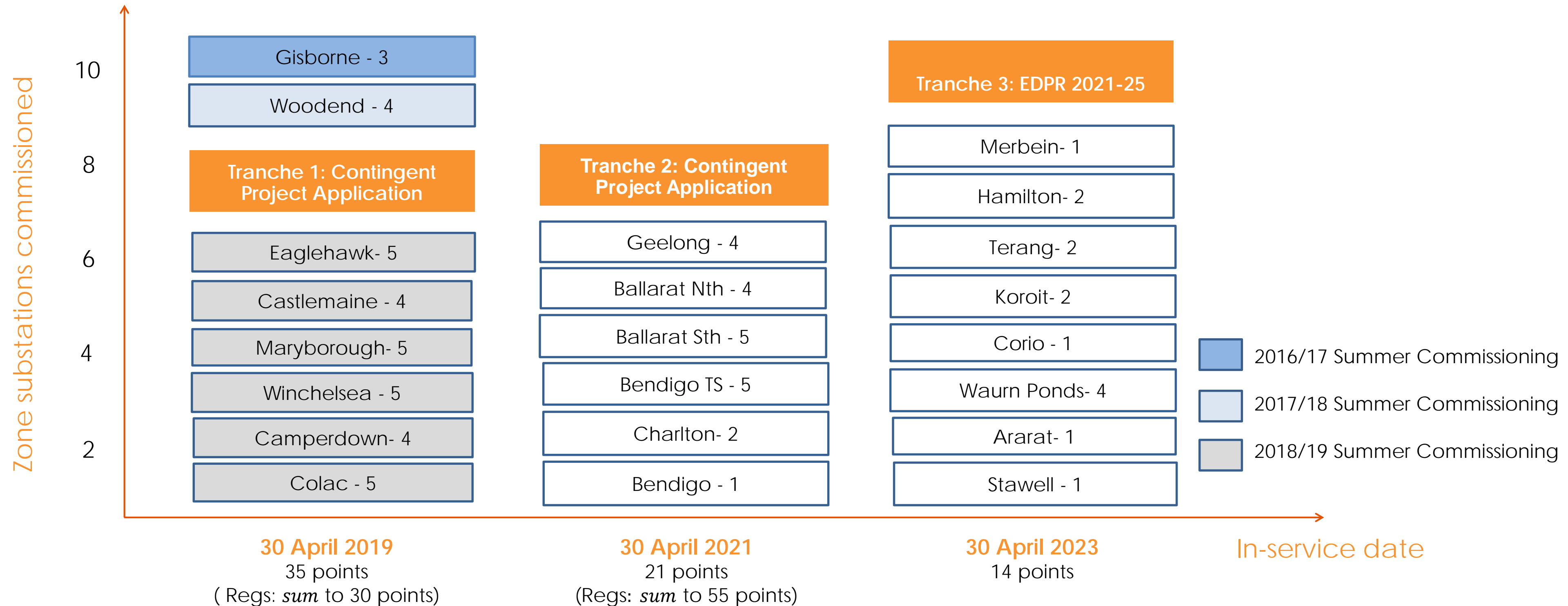
# SUMMARY

1. REFCL Deployment Status, including HV Customers
2. REFCL Program Risk Overview
3. Future Exemption Requests
4. SWER ACR Deployment Status
5. Powerline replacements in Electric Line Construction Areas





# LEARNINGS FROM OUR TRIAL SITES WILL INFORM DELIVERY OF OUR REFCL TIMETABLE



# 1. REFCL IMPLEMENTATION UPDATE



## GISBORNE

- Required capacity achieved in April 2017
- Working with ESV to reach agreement on appropriate testing protocols to allow formal certification from ESV
- REFCL in service 96% since January 2017, albeit not operating at full compliance sensitivity.
- 62 operations in 2017
  - 55 transient faults cleared without interruption to customers
  - 7 permanent faults with low energy and reduced fire risk
- No detriment to network reliability
- **Over summer 2017/18, will be available at 'required capacity (0.5 amp)' in the event of a Total Fire Ban day**

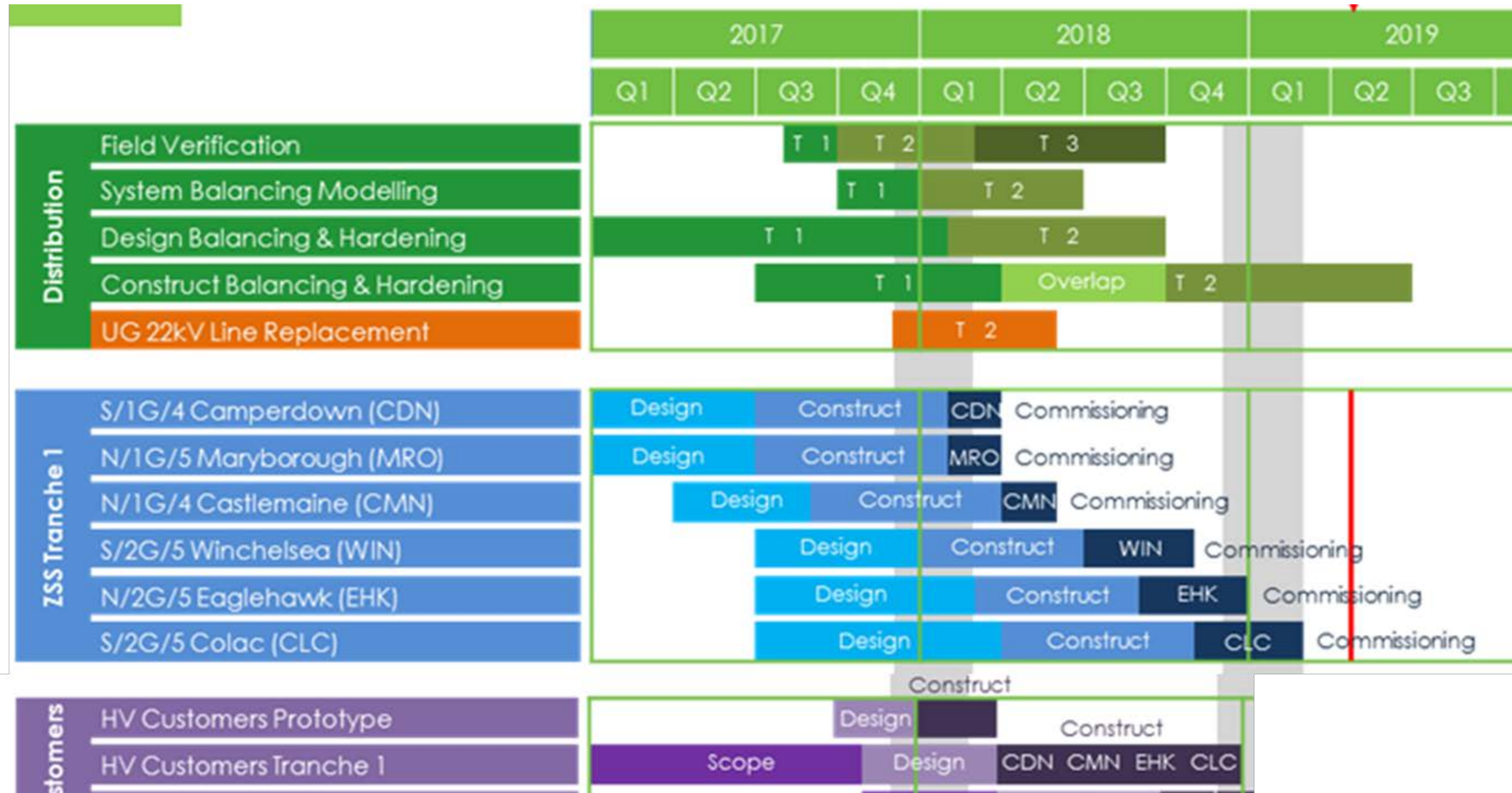


## WOODEND

- Commissioned into service 31st October with 92% availability since
- Performance levels not to full compliance
- Further software R&D required with Swedish Neutral
- First 2 REFCL station, with yet to be explained inconsistent performance, investigations continuing
- 22 operations in 30 days
  - 20 transient fault cleared without interruptions
  - 1 cross country fault and 1 fault where GFN was bypassed
- Further R&D activities for CT performance and testing of Swedish Neutral software in 2018
- **Over summer 2017/18, will be available on Total Fire Ban days with single REFCL unit with 1.0 amp sensitivity**



# 1. TRANCHE 1 DEPLOYMENT PROGRAM



# REFCL – TRANCHE 1 ISOLATION SUBSTATIONS

## Isolation Transformer delivery and construction schedule

Note: Commissioning dates subject to full customer agreement following negotiation of location and easement. To date, half of the HV customers have given in-principle agreement to the Isolating substation installation.

Note: Rate of delivery is 3 per month	Number Iso Tx Required	Delivery Date	Iso Tx Commissioning Completion Date	ZSS Commissioning Start Date	Detail
Castlemaine	3	Apr-18 (Feb-18 Prototype due)	May-18	May-18	2 x 6MVA, 1 x 3MVA (1 x 6MVA is the Prototype)
Winchelsea	2	May-18	Jun-18	Jul-18	2 x 3MVA for distribution (Not for HV Customers)
Eaglehawk	6	June and July 2018	Jul-18	Aug-18	2 x 6MVA, 4 x 3MVA
Colac	5	Aug and Sept 2018	Oct-18	Nov-18	2 x 6MVA (located in Zone sub), 3 x 3MVA

Item	Activity	Date	2017		2018											
			Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	
1	Place order with Tyree	23.11.17														
2	Order long lead time materials	Dec 17 – Mar 18														
3	Production window	Apr 18 – Sep 18			CMN (1) <sup>1</sup>			CMN (2)	EHK (1) WIN (2) <sup>2</sup>	EHK (3)	EHK (2) CLC (1)	CLC (3)				
4	Delivery window	May 19 – Oct 18				CMN (1) <sup>1</sup>			CMN (2)	EHK (1) WIN (2) <sup>2</sup>	EHK (3)	EHK (2) CLC (1)	CLC (3)			

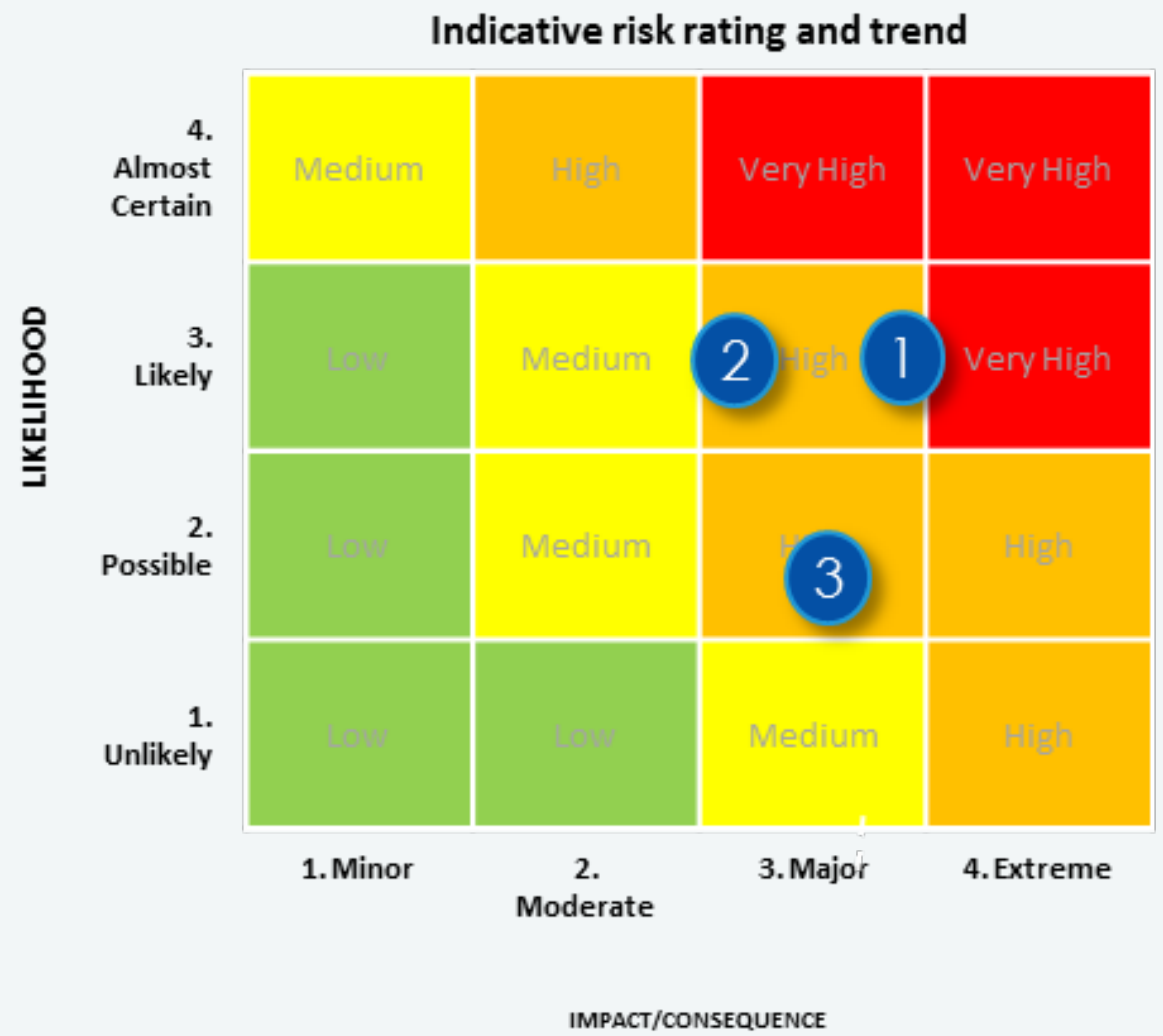
# REFCL TRANCHE 1 – HV CUSTOMERS

Zone Sub	Customer	Option	6MVA	3MVA	1MVA kiosk
Castlemaine	George Western Foods (Main Factory)1	Shared Isolation Substation	1		
Castlemaine	George Western Foods (Secondary Factory)1				
Castlemaine	Flowserve (Hunter St)	Shared Isolation Substation	1		
Castlemaine	Flowserve (Parker St)				
Castlemaine	AGL Hydro	Single Isolation Substation		1	
Eaglehawk	Keech Castings	Shared Isolation Substation	1		
Eaglehawk	Motherson Elastomers				
Eaglehawk	Coliban Water 1	Single Isolation Substations		1	
Eaglehawk	Coliban Water 2				
Eaglehawk	Hofmann Engineering	Shared Isolation Substation		1	
Eaglehawk	Thales Australia				
Eaglehawk	Southern Shorthaul Railroad	LV conversion			1
Eaglehawk	Parmalat Australia	Single Isolation Substation		1	
Eaglehawk	Bendigo Health Care	Single Isolation Substation	1		
Colac	Regal Cream Products (East Fdr)	Shared Isolation Substations (located in Colac ZSS)	2		
Colac	Regal Cream Products (West Fdr)				
Colac	AKD Softwoods (7-15 Forrest St)				
Colac	AKD Softwoods (Warrowie Rd)	Single Isolation Substation		1	
Colac	Australian Lamb Company	Single Isolation Substation		1	
Colac	Regal Cream Products (Lot 2 Forrest St)	Single Isolation Substation		1	

Notes: 1) Prototype site



## 2. REFCL PROGRAM RISKS SUMMARY



● Open risk: Risk events currently being addressed

↑ Risk rating increased

↓ Risk rating decreased

■ No change to risk rating

#	Strategic Risk Area	Risk description	Trend
1	0.5 Amp performance	Achieving the 0.5amp sensitivity on all sub-stations prior to regulatory due dates is not certain. Recent performance of WND have highlighted new challenges with multi-GFN sites.	↑
2	HV customer works	HV customers may be impacted by voltage variation from REFCL. PAL needs regulatory clarity immediately to avoid further program delays and enable adequate revenue certainty. Essential Services Commission has indicated voltage compliance review will be complete mid 2018	■
3	Grimes review	Grimes Interim Review has recommended a REFCL review prior to Tranche 2. While PAL has highlighted the positive aspects of such a review, this immediately creates regulatory uncertainty whilst the Minister considers the recommendation. If endorsed, a review must also have a 'stop the clock' for the regulatory due dates.	★ new

During Tranche 1 we are very much in R&D mode, identifying and implementing additional works where we can, in working toward the goal of achieving 'required capacity'. Our Trial site projects at GSB and WND not yet completed.



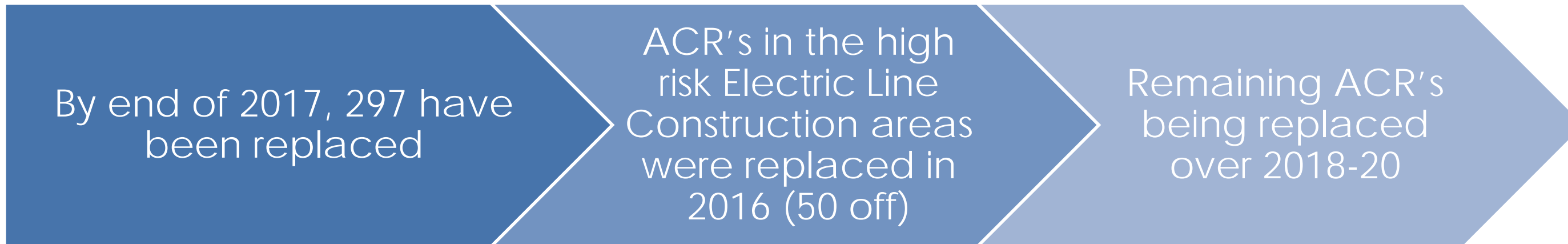
### 3. FUTURE EXEMPTION REQUESTS

1. On 15 August Powercor submitted a request that underground or overhead insulated polyphase electric lines (PELs) be exempt from the requirement to be REFCL protected. Individual Exemptions per zone substation are being prepared while initial discussions have been held with ESV staff. Exemption for Castlemaine has now been lodged.
2. A request for a 6 month time exemption for Tranche 2 is being submitted, on the basis of the uncertainty around Tranche 2 timing arising from the Grimes Review Interim Report, and to accommodate the expected finalisation by mid year of the ESC review of the Distribution Code voltage limits, as they apply to HV Customer sites.
3. A future request for a time extension within Tranche 1 is possible where:
  - The installation of an isolating substation at a HV customer site impacts a service date
4. A future request for relief against the performance requirements is likely where we have not reached 'required capacity', despite our reasonable endeavours. It must be noted that through the experiences at our Trial projects, PAL has not yet been able to achieve required performance at WND. The Trial projects have also identified the need for further R&D work by Swedish Neutral.



# 4. SWER DEPLOYMENT STATUS

Total of 1,062 SWER ACR's are to be replaced with new functionality ACR's



Year	2018	2019	2020
Qty to be replaced	350	265	150





# 5. POWERLINE REPLACEMENT

