

# Section 8 Committee

13 June 2017

**Presented by Steven Neave and Tom Hallam**

GM, Electricity Networks, (Powercor) GM Regulation and Network Strategy (AusNet)



# **REFCL Trials – Current Status**



# GSB/WND Trial Sites

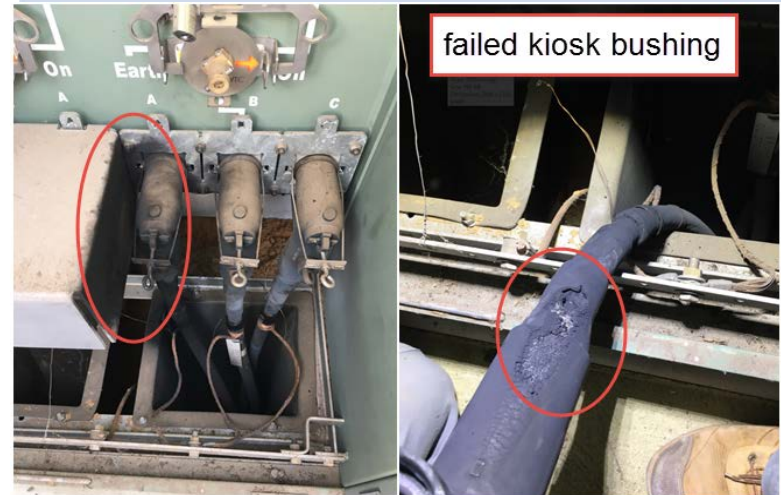


## GSB REFCL

- GSB – believe we have met performance standard (0.5A)
  - we have developed, tested and commissioned a working three and single phase balancing solution – a significant technical achievement
  - Our compliance test methodology being ratified via the TWG
- Commissioned September 2016
  - Two cable failures during commissioning
  - 75% availability since switched into service 24/7
- Fire risk mode trialled over summer (Sep'16-Apr'17)
  - Compensate, soft fault confirm and direct trip CB for permanent faults
  - 2 x false tripping occurrences
- Now using normal mode to trial fault detection and discrimination of REFCL with other protective devices
- Two sensitivities available
  - 12.7k $\Omega$  (1.0A) selected for TFB days
  - 8k $\Omega$  used at all other times

## WND REFCL

- Network stress testing completed on all 22kV buses without major incident
  - Two blown surge arrestors (only 1 found – Bowthorpe 24kV)
- Problems experienced during performance standard testing (U/G faults x 2, kiosk bushing failure, feeder CTs require replacement)
- Commissioning on hold until repairs are completed and replacement CTs are sourced and implemented

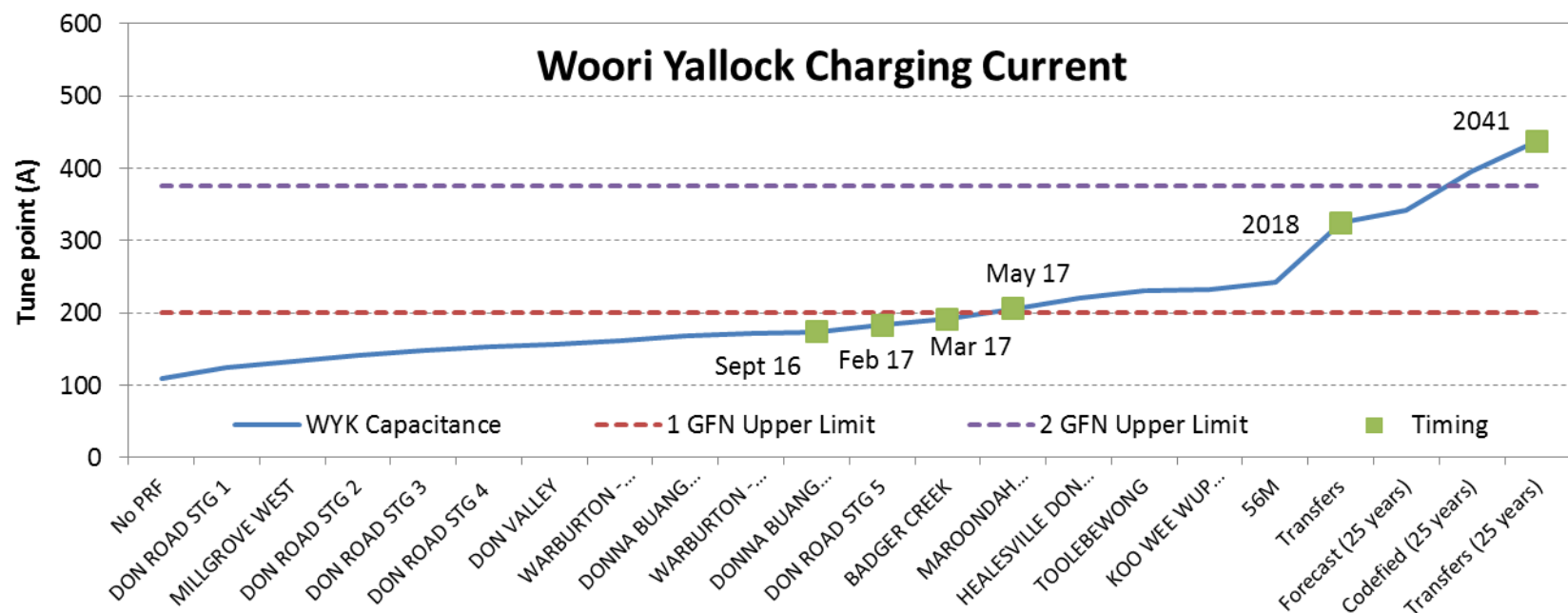


**GSB at capacity but many challenges remain on WND**

# Woori Yallock Progress:



- ▶ **PRF (undergrounding) works have been impacting on capacitance of WYK network**
  - › Load transfers have been used to keep REFCL operating to date
  - › Options have been exhausted so REFCL will stop operating at the end of June
- ▶ **Design commenced on 2<sup>nd</sup> REFCL**
  - › Expected to be in service by April 2018



# Woori Yallock Progress:



- ▶ **The WYK GFN experienced 2 major hardware failures over the last 2 months:**
  - › Processor card failure on the 18th of April
  - › Inverter contactors locked up on the 2nd of May



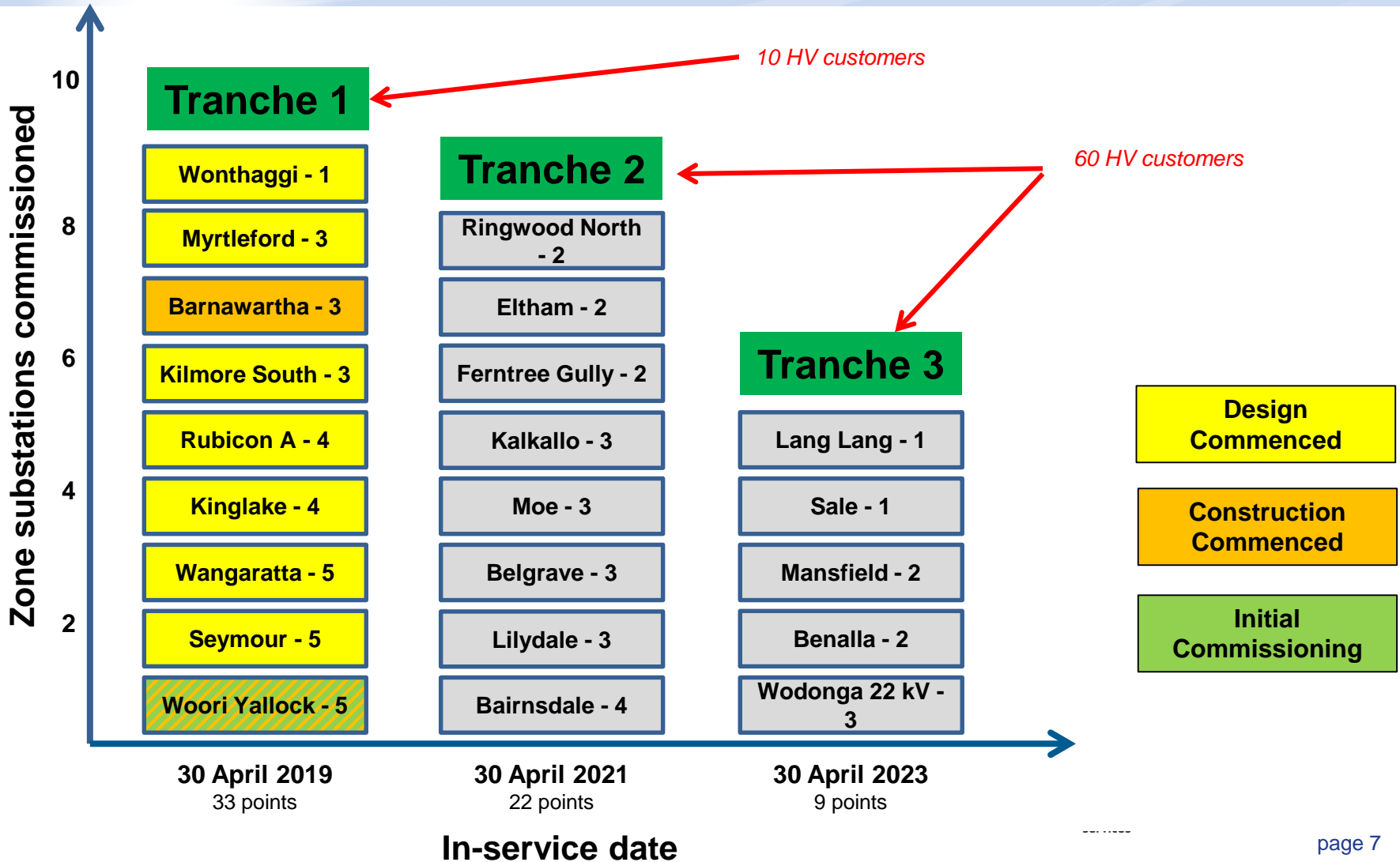
- ▶ **For each failure, the GFN taken out service for a period of up to 10 days to carry out fixes. Manufacturer informed of failure and sent faulty parts for further investigation.**
- ▶ **Troubleshooting manual developed internally in the event of future failures.**
- ▶ **Since the GFN was put back in service on the 7th of May, the Woori Yallock network experienced 7 transient faults. GFN operated as expected for these faults.**



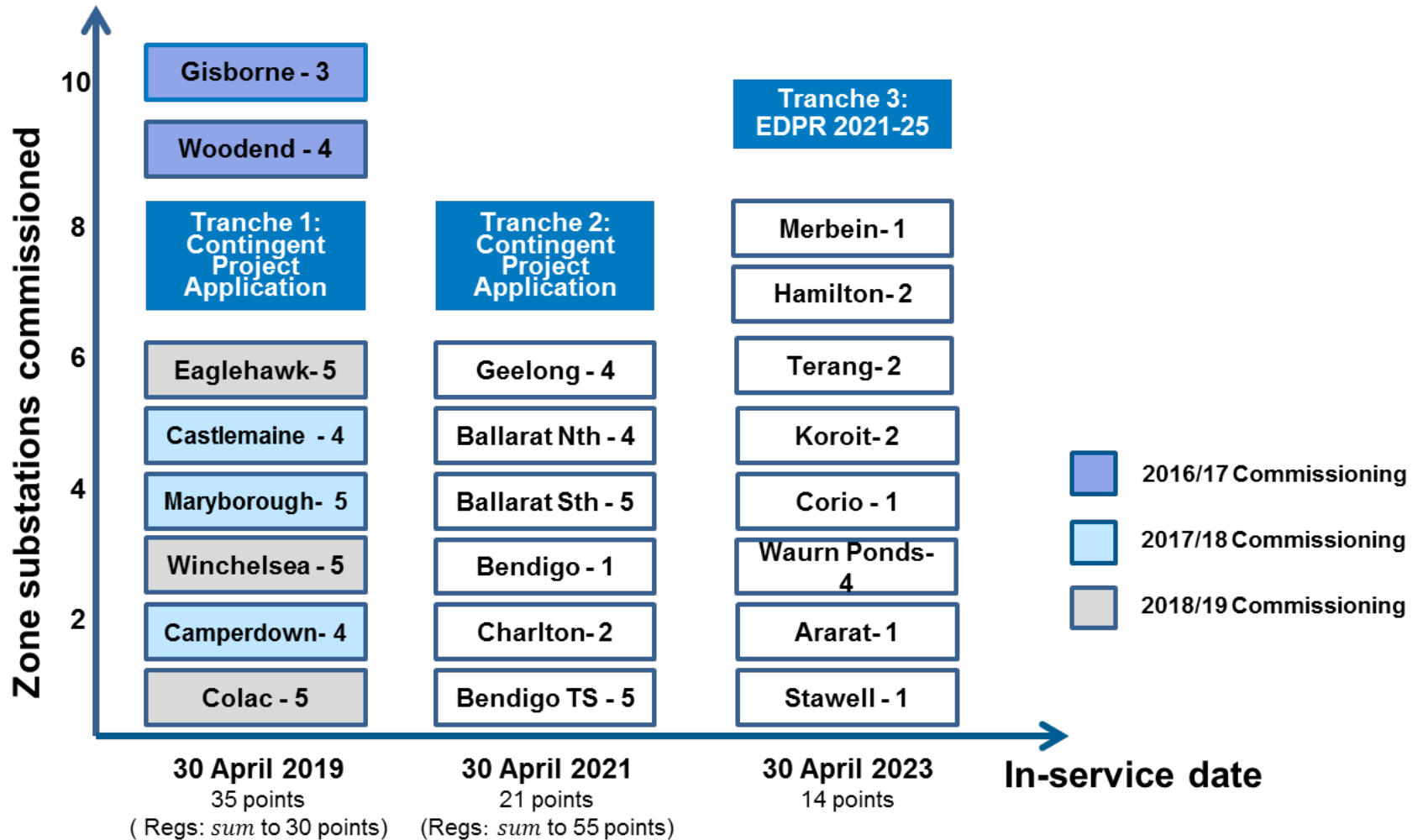
# **Timeline & Contingent Project**



# REFCL Program - Timetable

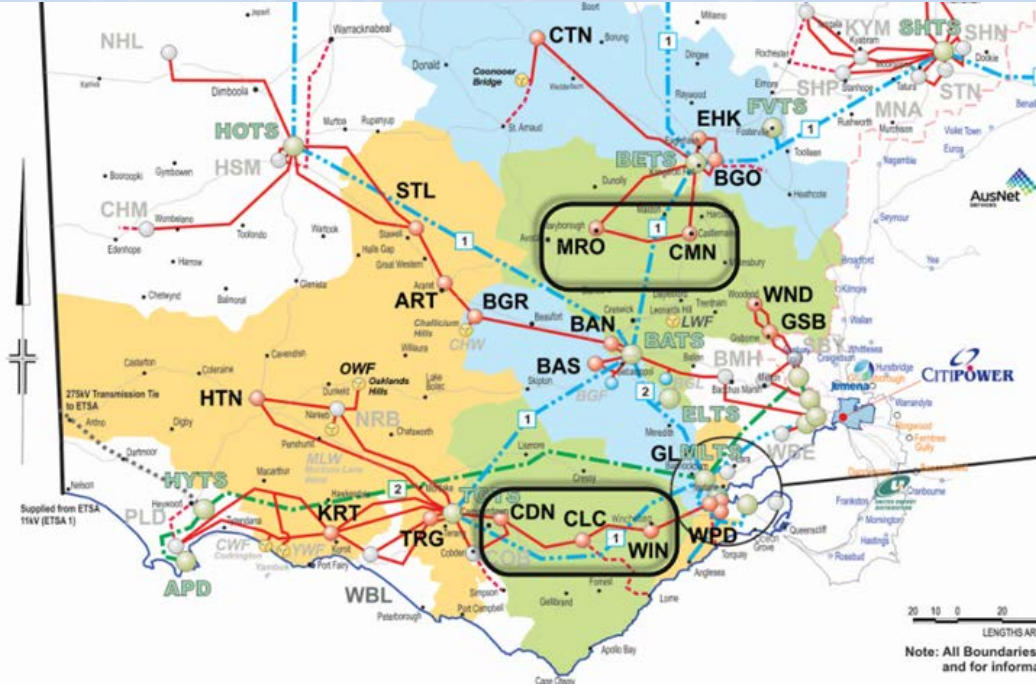


# REFCL Program - Timetable





# REFCL Program



Count	Tranche 1				Tranche 2				Tranche 3			
	Station	Planned Install <sup>[1]</sup>	Req'd Capacity	Pts	Station	Planned Install <sup>[1]</sup>	Req'd Capacity	Pts	Station	Planned Install <sup>[1]</sup>	Req'd Capacity	Pts
1	Gisborne	Apr-17	Apr-19	3	Bendigo TS	May-20	Apr-21	5	Stawell	Mar-23	Apr-23	1
2	Woodend	May-17	Apr-19	4	Charlton	Mar-20	Apr-21	2	Ararat	Apr-23	Apr-23	1
3	Colac	Mar-19	Apr-19	5	Bendigo	Apr-20	Apr-21	1	Waurnd Ponds	May-21	Apr-23	4
4	Camperdown	Apr-18	Apr-19	4	Ballarat South	Apr-21	Apr-21	5	Corio	Apr-21	Apr-23	1
5	Winchelsea	Apr-19	Apr-19	5	Ballarat North	Mar-21	Apr-21	4	Koroit	Apr-22	Apr-23	2
6	Maryborough	Apr-19	Apr-19	5	Geelong	Apr-21	Apr-21	4	Terang	Mar-22	Apr-23	2
7	Castlemaine	May-18	Apr-19	4					Hamilton	Mar-21	Apr-23	2
8	Eaglehawk	Jun-19	Apr-21	5					Merbein	Apr-23	Apr-23	1
<b>Subtotal</b>				35				21				14
<b>Total</b>				35				56				70
<b>Target</b>				30				55				69



# **Distribution Code & HV Customers**



# Electricity Distribution Code – no change

Table 1

STANDARD NOMINAL VOLTAGE VARIATIONS				
Voltage Level in kV	Voltage Range for Time Periods			Maximum Voltage
	Steady State	Less than 1 minute	Less than 10 seconds	
< 1.0	+10% - 6%	+14% - 10%	Phase to Earth +50%-100% Phase to Phase +20%-100%	6 kV peak
1-6.6	± 6 %	± 10%	Phase to Earth +80%-100% Phase to Phase +20%-100%	60 kV peak
11	(± 10 %			95 kV peak
22	Rural Areas)			150 kV peak
66	± 10 %	± 15%	Phase to Earth +50%-100% Phase to Phase +20%-100%	325 kV peak

- ▶ REFCL operation is outside distribution code voltage range
- ▶ ESC has decline to act on 'no action' request or code change
  - › Consider REFCL regs trump distribution code; but
  - › Distributors continue to be liable for HV customer equipment damage and economic loss

# Electricity Distribution Code

- ▶ **DBs consider Code change is required before testing or upgrading of customer owned assets can be justified**
  
- ▶ **ESC announced review of Distribution Code will commence in 2017-18.**
  - › Encouraged to begin review in July
  - › Has not committed to code change
  - › AER written to ESC seeking intention – reply by 30 June
  - › Nothing happening until next calendar year, and no guarantee code will be amended
  
- ▶ **Review will be broad based not just focused on REFCL issue**
  - › This lengthens time for review
  - › Will rely on cost benefit analysis of changes
  - › Danger of needlessly revisiting benefits case set out in RIS
  
- ▶ **Review may not address ‘who pays’ issue**

# HV customer solution

## ▶ **ESV report:**

- Notes that customer side solution could be more cost effective
- PAL/AusNet suggest expanding on analysis of the advantages of network solution
- Do not believe accurately addresses the regulatory framework such as obligations in the Distribution Code, or CPA process
- May understate risk of unforeseen failures and reliability impacts on customers

## ▶ **Tranche 1:**

- Discussions held with all HV customers
- Network solution is the only prudent technical option in the current regulatory framework and timeframe, and still requires DB's to seek a 6 month time extension for Tranche 1 sites with HV customer connections

## ▶ **Tranche 2 and 3:**

- Immediate change to code or continuing no action letter
- Immediate Vic Gov funded program to enable customers to assess their infrastructure
- Immediate Vic Gov funded program to enable customers to harden their infrastructure
- DBs to assist customers through these processes
- May require extension of time approved for Tranche 2

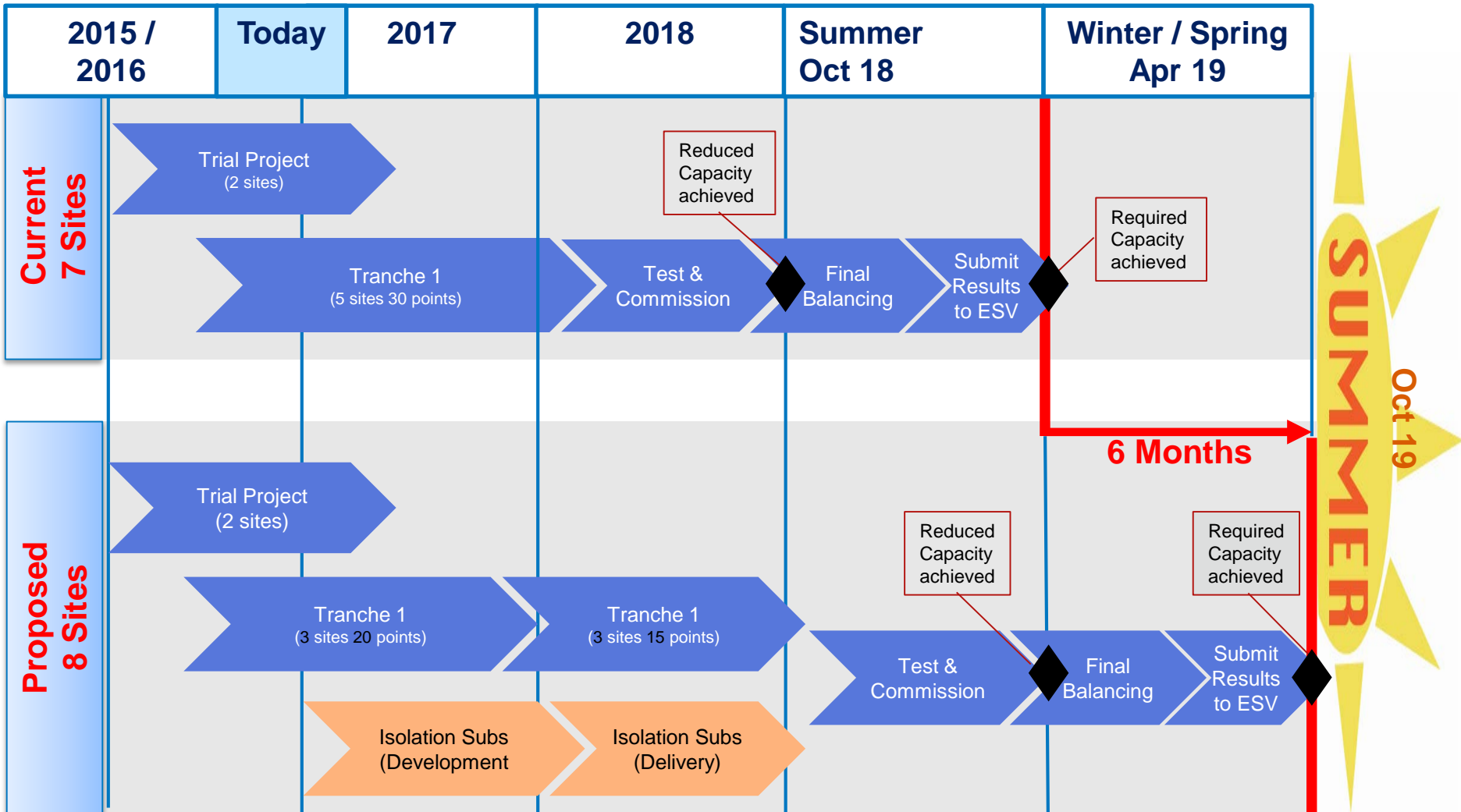




# **Extension to Tranche 1**



# Request For Extension Tranche 1



# Covered conductor update

- **3<sup>rd</sup> pilot project of LoSAG experienced a conductor failure during final tensioning**
- **Project located at Chaplains Creasy**
- **Three project exemptions with ESV currently in place**
- **Joint investigation and further testing with manufacturer**
- **Issue appears to relate to performance of insulation under high heat situations**
- **All LoSAG work suspended until thorough due diligence completed.**
- **Unclear if this is a fundamental design flaw or able to be rectified.**





# Questions

