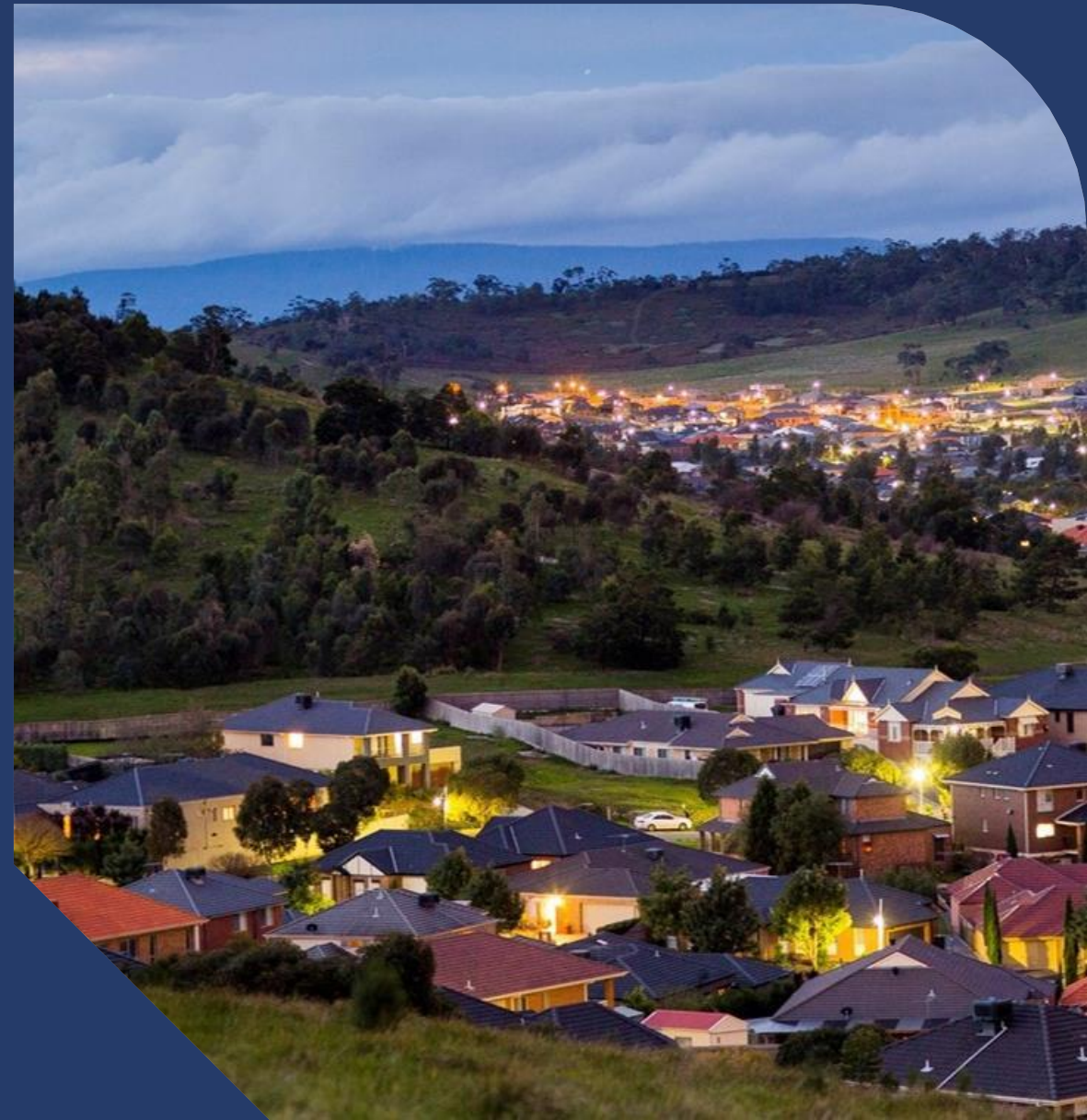


AusNet

Development Industry Briefing

Preparing for All Electric Estates

Tuesday 14 November 2023





Acknowledgement of Country

We acknowledge Aboriginal people as the Traditional Owners and Custodians of the land we live and work on, and we pay our respects to Elders past, present and emerging.



Lilydale – safety information



First aiders

Almost all employees are first aid trained at Lilydale, so you are in safe hands!

Emergency Warning System

Alert Tone "BEEP... BEEP... BEEP"

1. Be aware there is a potential Emergency
2. Do not commence evacuation, unless it is unsafe in your area or directed by Wardens
3. Follow all instructions given by Wardens
4. Await "All Clear" message, OR
5. Should an Evacuation be required you will hear...

Evacuation Tone "WHOOP... WHOOP... WHOOP"

1. Evacuate via exit as directed by Wardens
2. Do NOT use the lifts
3. Proceed to the Assembly Area >
4. Follow all instructions given by wardens

The AusNet Team

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Customer Engagement



Lucy Holder
Customer Engagement Manager



Michaela Jackson
Engagement Specialist



Emma Ferrie
Engagement Officer

Electricity – Customer Works



Craig Velt
Program Operations Manager



Andrew Webber
Design Compliance Specialist



Ross Morgan
Lead Compliance Specialist



Brian Morrison
Network Assurance Specialist

Network Planning



Gaurav Sharma
Principal Engineer, Network Planning

Regulation



Charlotte Eddy
General Manager, Regulation
(Distribution)



Sonja Lekovic
Regulatory Policy Manager



Justin Betlehem
Senior Regulatory Advisor

Purpose of Today's Briefing

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To provide the development industry with an understanding of:

- the demand impact of Electric Vehicle chargers and reduction in gas usage in housing estates
- additional assets to meet new and future electricity demands
- design impacts and land needs, including impacts to overall plans
- cost implications for developments
- the timing of the transition to fully electric estates as customer demand changes
- developments in Rapid Earth Fault Current Limiter Program (REFCL) zones
- Vinyl wrap of kiosks

Please **post questions & comments in the chat** throughout and we'll try and respond to as many as we can.



Please turn your **cameras off** and **mics on mute** unless speaking



01

Safety moment | Cable
theft in the industry

Risks to safety

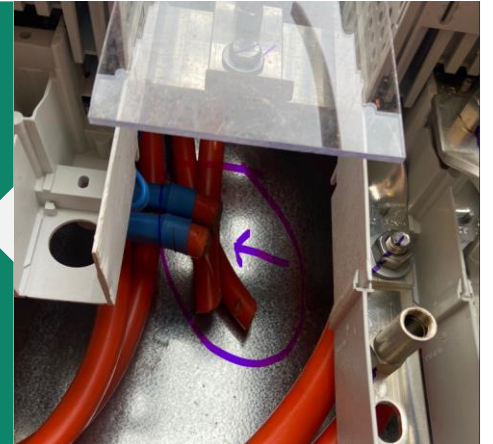
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Thieves often cut holes in fencing to enter estates and substations.



Ultimately, the copper thieves are putting their own lives at risk as they are not always aware of what is LIVE and what is not on supply.



When underground cables are removed, usually part of the wire or protective guards are left hanging or create a tripping hazard that would not normally be identified.



People who work in substations could encounter damaged ungrounded equipment

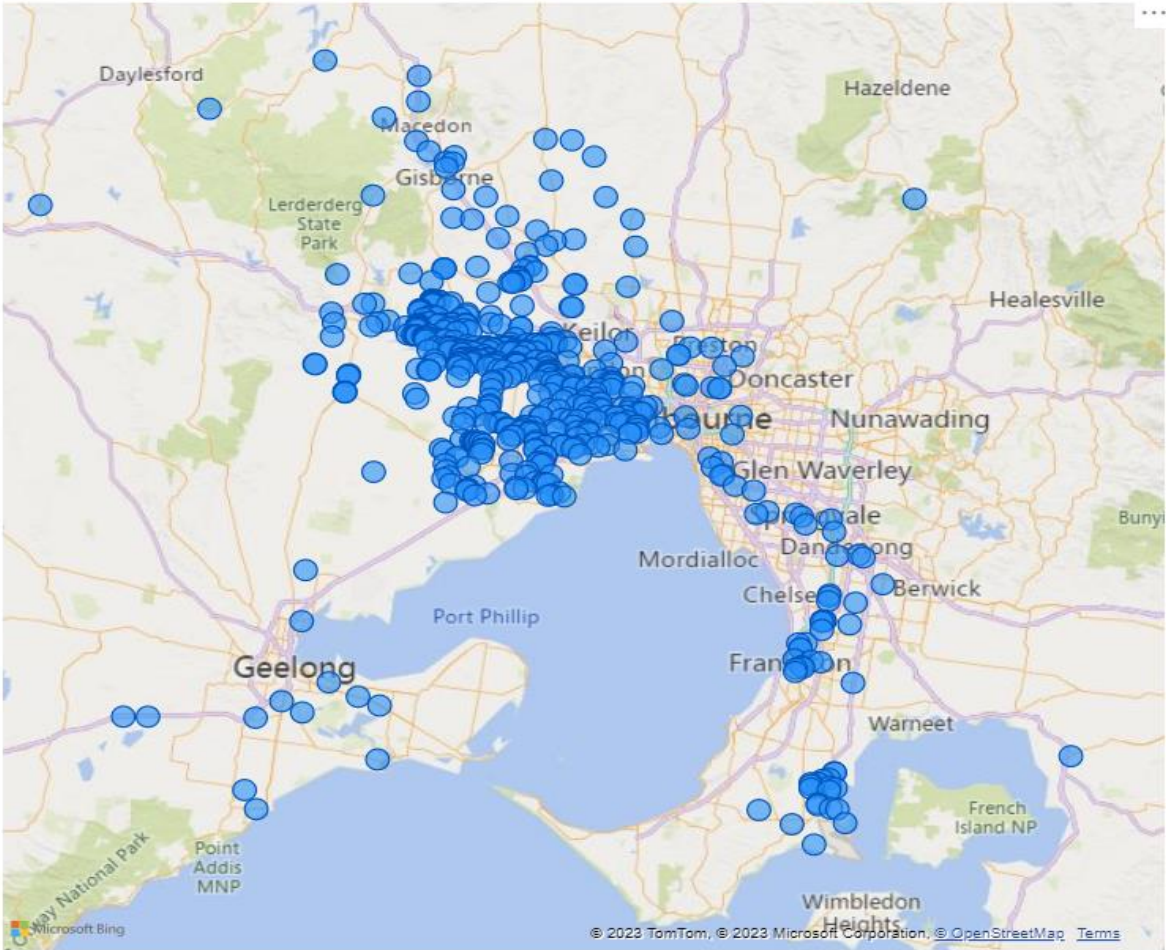
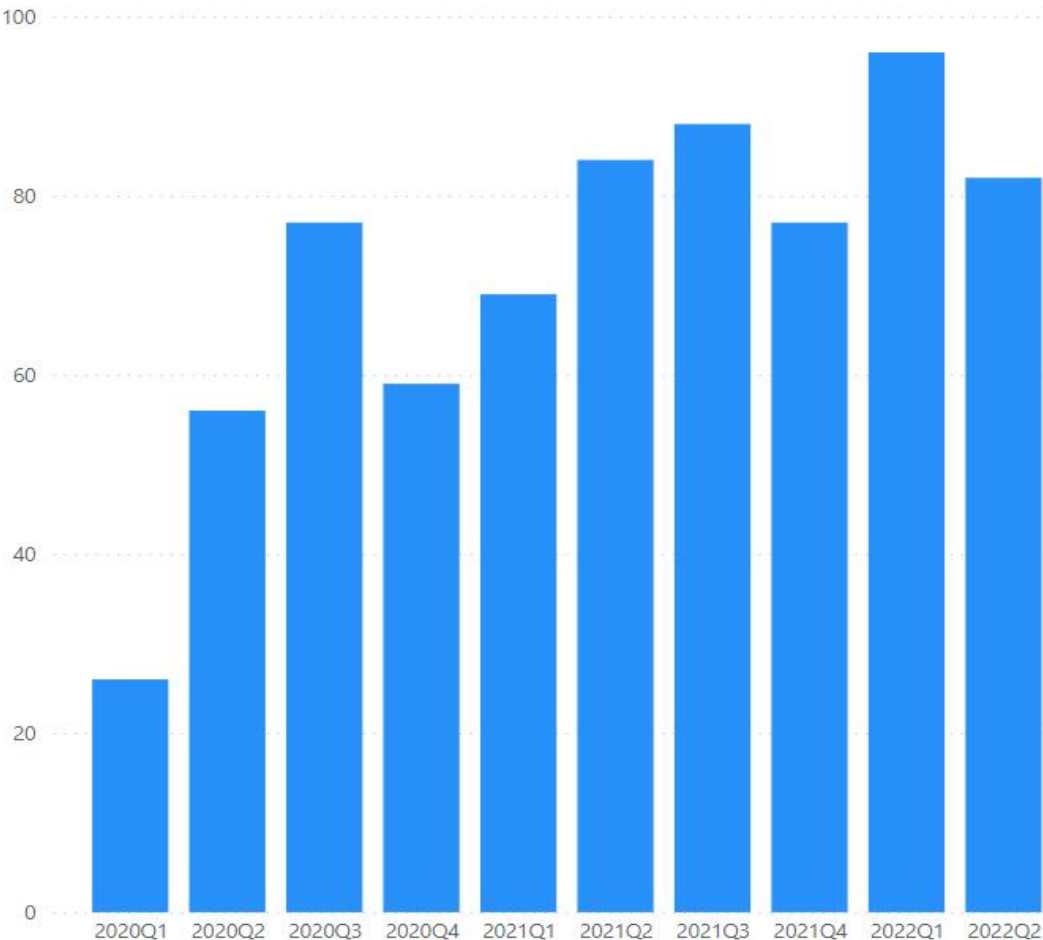


Theft results in significant economic losses and disruptions to critical infrastructure.

Energy Safe Victoria – Incident Mapping 2020 - 2022

ESV Copper theft incident summary

Figures are as reported to ESV by DBs for quarterly reporting
Only shows incidents with Lat Long provided
Date range from Q1 2020 to Q2 2022 inclusive



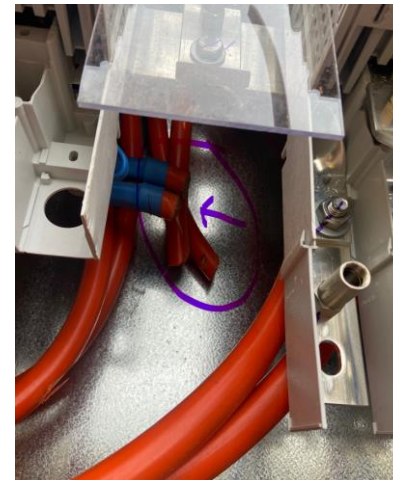
Type of theft

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- Streetlight supply cables out of pits (16mm / 35mm copper)
- HV cable from poles (aluminium / copper screens)
- Stripped out cabinets
- Stripped out kiosks
- Estate's main cable (aluminium)
- Pole-to-pit dress-ups (16mm / 35 mm copper)



Epping



Cranbourne
East

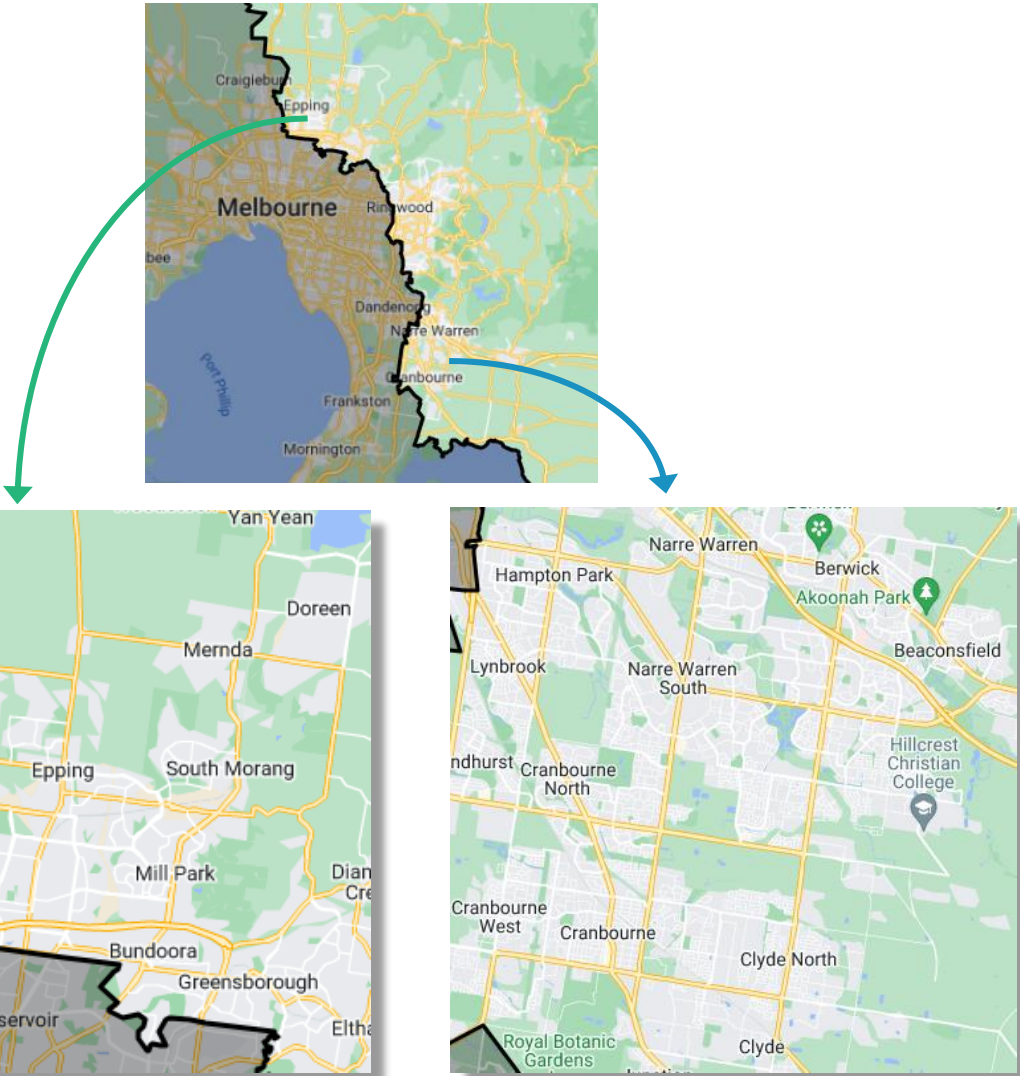
Locations in AusNet where theft is occurring

LOCATION

Mernda
Epping
Wollert
Cranbourne East
Berwick
Beaconsfield
Clyde North

INFRASTRUCTURE

Streetlight
Significant
Significant
Kiosk
Streetlight
Damage
\$5k LV



What can you do

- Engage with local Police – ensure the local OIC is aware of the project, timelines, high risk periods
- Real time monitoring / detection – Police will only respond to confirmed offenders present calls
- Report to Police – all events so that local intelligence can support intelligence led taskings
- Police Assistance Line now makes reporting matters to Police much easier
- Task force has been setup for high-risk areas



02

Demand | Impacts of Electric Vehicles and electrification on electricity demand

What is changing?

Electrification:

- **CO² reduction targets** are driving electrification of vehicles and cessation of domestic natural gas is changing our landscape.
- Reticulation of natural gas to domestic housing estates will cease for any housing project that requires a planning permit after January 2024
- With CO² reduction targets there is likely to be a shift in consumer sentiment towards electrification that will put **pressure on the electricity networks to appropriately fill any demand gaps**
- The ability to re-distribute energy sources produced locally from home solar and batteries will be an important part of energy transition
- **Customers need to feel secure about energy supply** where mains electricity will be the prime energy source
- **Customer expectations of electricity networks are likely to increase** as households exit fossil fuel use

REMINDER

Victorian Gas connections ban

- On 28 July 2023, the Victorian Government announced a partial restriction on new residential gas connections from 1 January 2024.
- This restriction only applies to developments and residential home builds that need a planning permit that have not already been submitted or approved by 1 January 2024.
- For more information, visit the **Victorian Planning Authority website** or speak to your local council.

How will it apply

This restriction does **not** apply to:

- Most single dwelling homes that can be built without a planning permit (most new residential builds or land developments only need a building permit)
- Residential builds and land developments with existing subdivision planning permits submitted to local council by 1 January 2024. These developments can still connect to gas regardless of when they are to be constructed
- New and existing commercial and industrial land developments and connections.

How are estates serviced now?

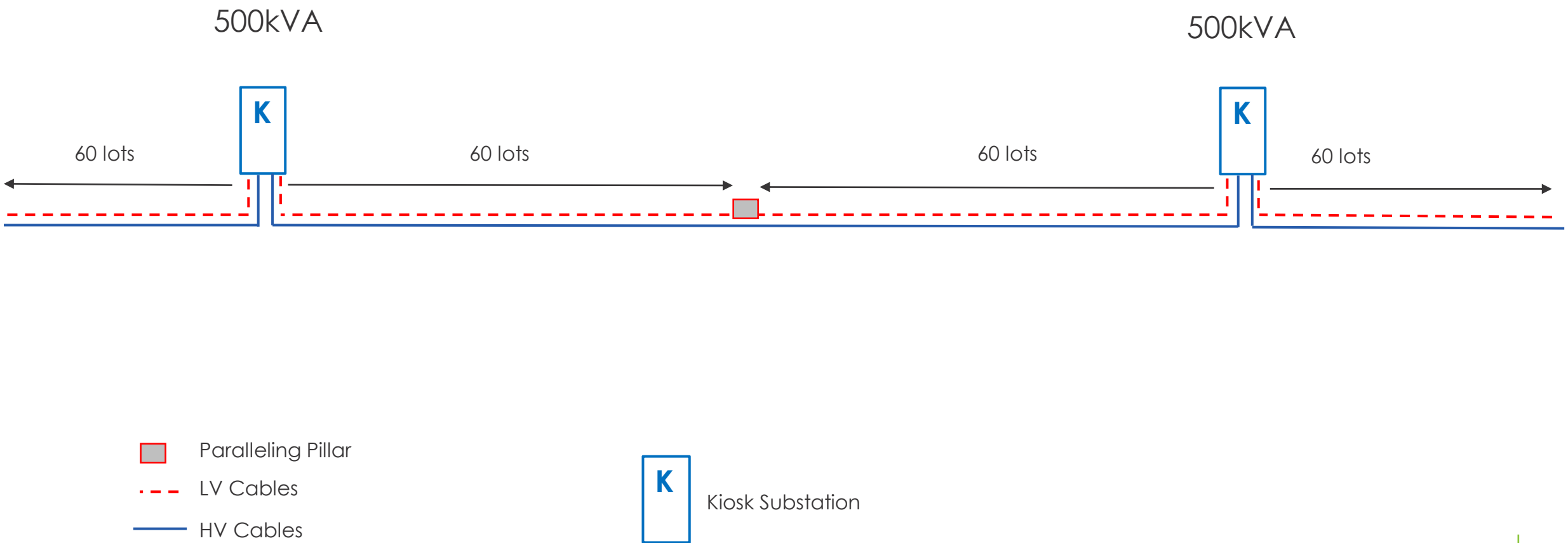
Basics of electrical infrastructure design for URD housing estates:

- Electrical infrastructure for housing estates is design based on the basis of and ADMD (After Diversity Maximum Demand) of 4kVA
- 4kVA is around 20Amps per lot single phase (toaster and kettle running at the same time)
- Most houses/units have individual calculated maximum demands far in excess of 20A single phase. E.g. new EV chargers are 32A, induction hot plates 40A, reverse cycle AC systems 15-25A per phase
- Electricity Networks **rely upon diversity of use of consumers** in housing estates to minimise unnecessary infrastructure to meet consumer demand (efficiency of use).
- Despite some very large modern houses, with diversity of time of use, this 4kVA design criteria has been effective to date where natural gas is reticulated.
- Notably, in **summer 2018 a significant number of kiosk substation failures** occurred due to overload in areas previously designed at 3kVA

But what about future use?

Current Design Approach (Simplified)

Basics of URD design @ 4kVA per lot:



Interim Report information ADMD

- Interim report information used to assist with design criteria

Table 1: MEDIAN ADMD results for new all electric estates with 1-5kW of rooftop PV and 2030 EV uptake

	ADMD – modern all electric houses including heating, HWS and EV (with solar) - Summer	ADMD – Modern all electric houses including heating, HWS and EV (with solar) (prolonged cloudy conditions in winter)
Classifications	ADMD	ADMD
Rural	4.4	5.6
Township	4.9	6.0
Urban	4.9	6.3
Overall network	4.5	5.7

Key Takeaways

- 1-5 kW of PV installed partially offset the increase in ADMD for all-electric estates
- EVs forecast to increase ADMD between **1.3-3.3** kVA by 2030, analysis suggests this can be mitigated partially with controlled charging windows.
- Winter recorded higher median ADMD values than summer

03 Electricity assets required to meet future demand | additional assets

Additional Assets

What will need to change:

- **More kiosk substations** will be required to service developments moving forward
- Design's **catering for Electric Vehicle (EV) chargers** will need to be in the initial phase of transition – this could result in up to 50% more kiosks being required in future stages
- **When natural gas is not reticulated**, up to double the kiosk sites is expected
- The change to the LV network will be **entry and exit cabling** to the additional kiosk substation sites and **more paralleling pillars** between

AusNet will work with developers in good faith through the steps necessary for transition.

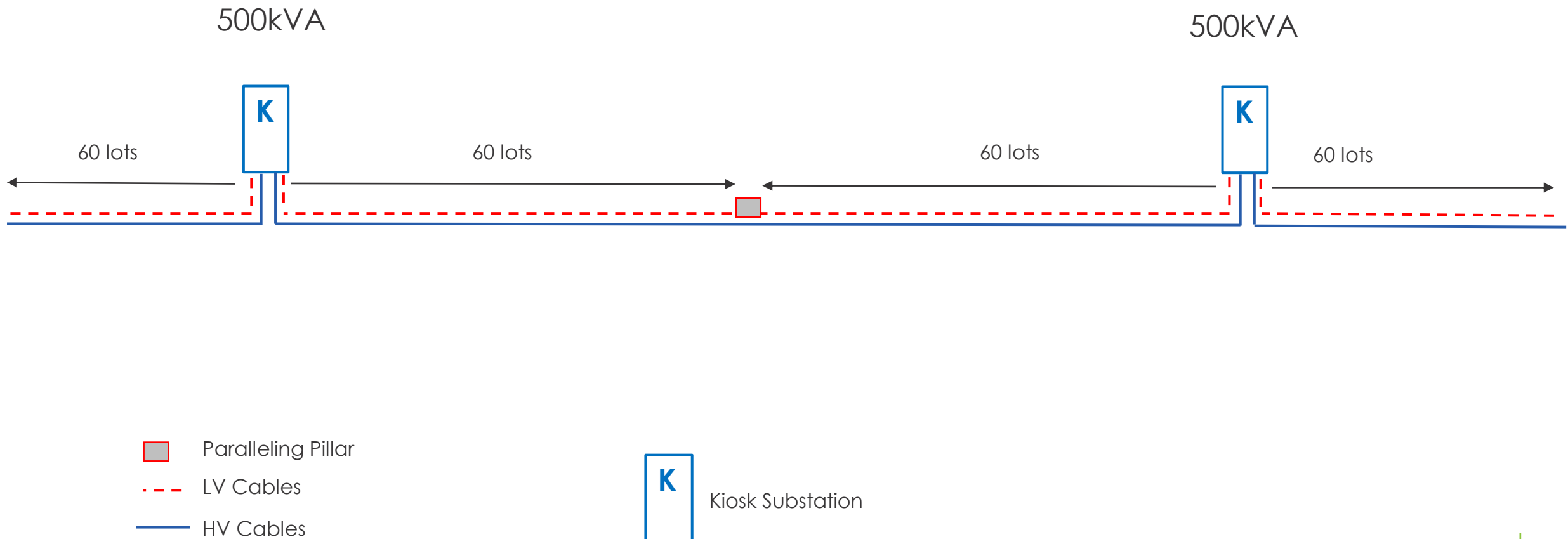
04

**Design impacts & land
needs |
implications to overall plans**

Design Approach | Current (Simplified)

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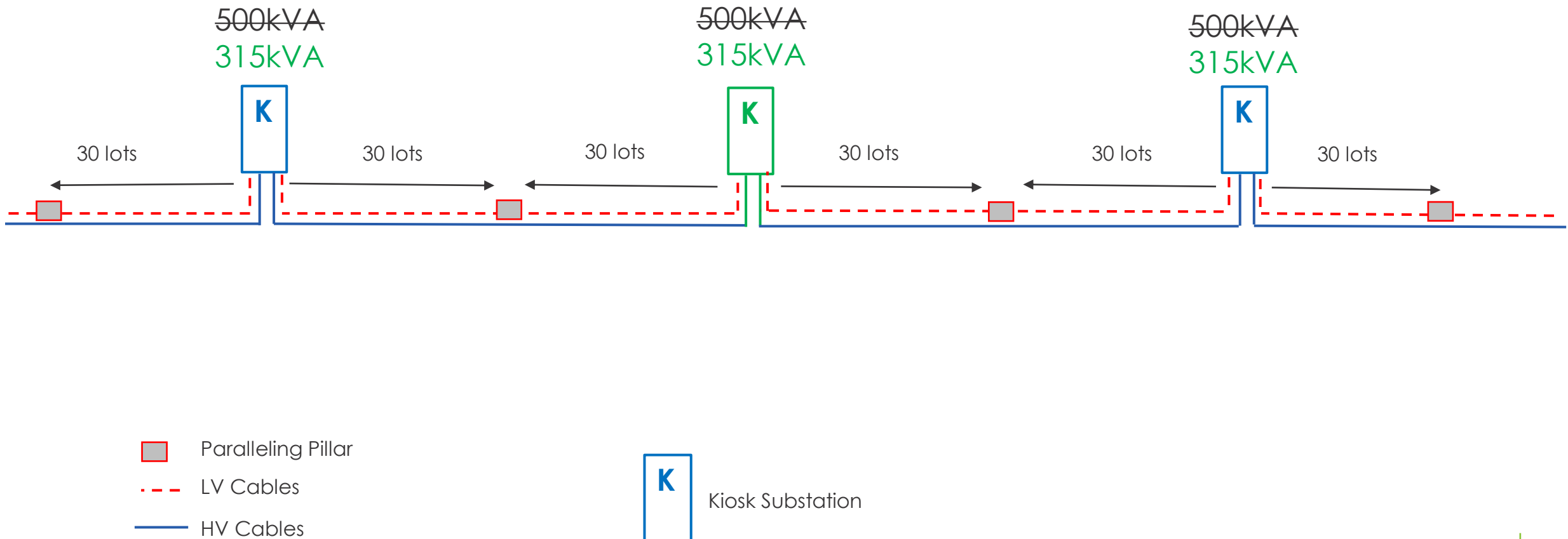
Basics of URD design @ 4kVA per lot:



Design Approach | Upcoming changes

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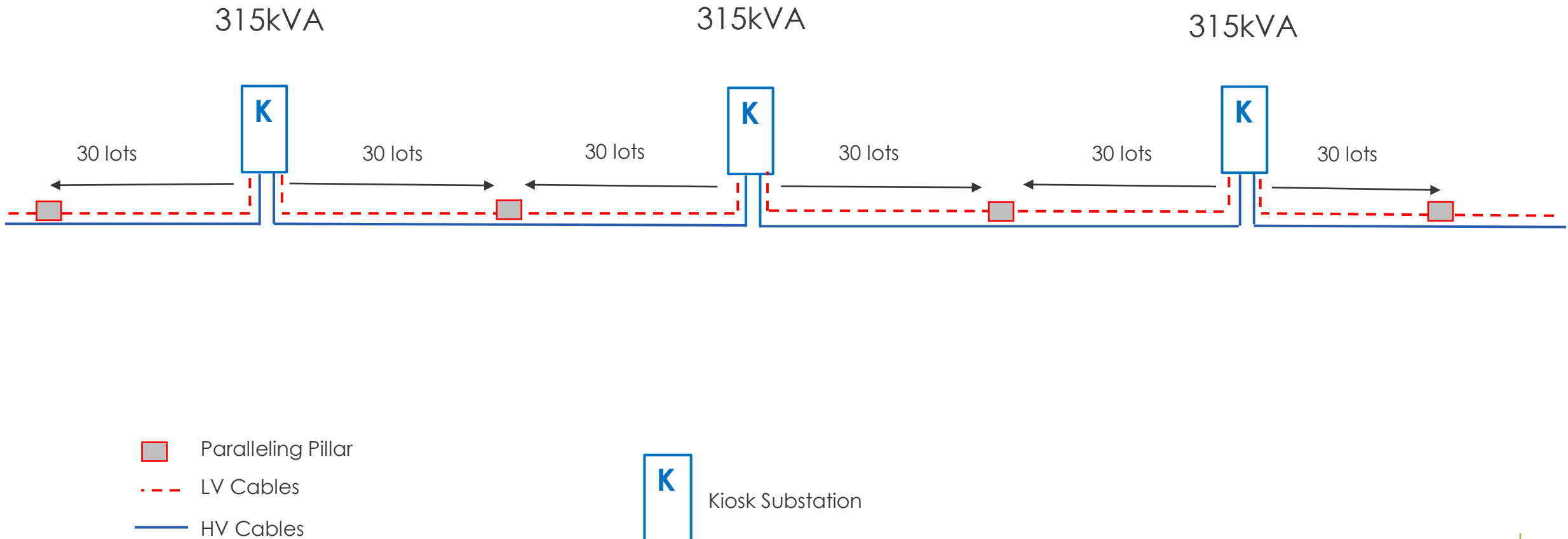
Basics of URD design @ 5.25kVA per lot:



Design Approach | From Jan 2024 and after the transition to all electric estates

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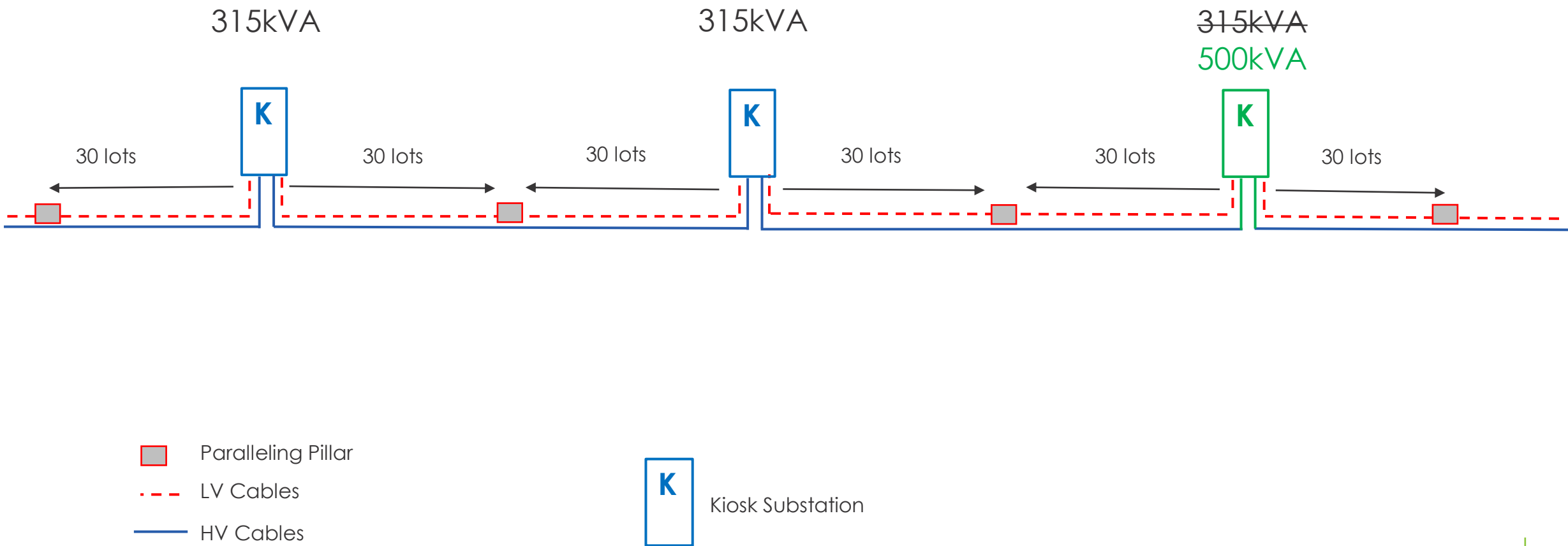
Basics of URD design @ 5.25kVA per lot:



Flexibility for changed demand

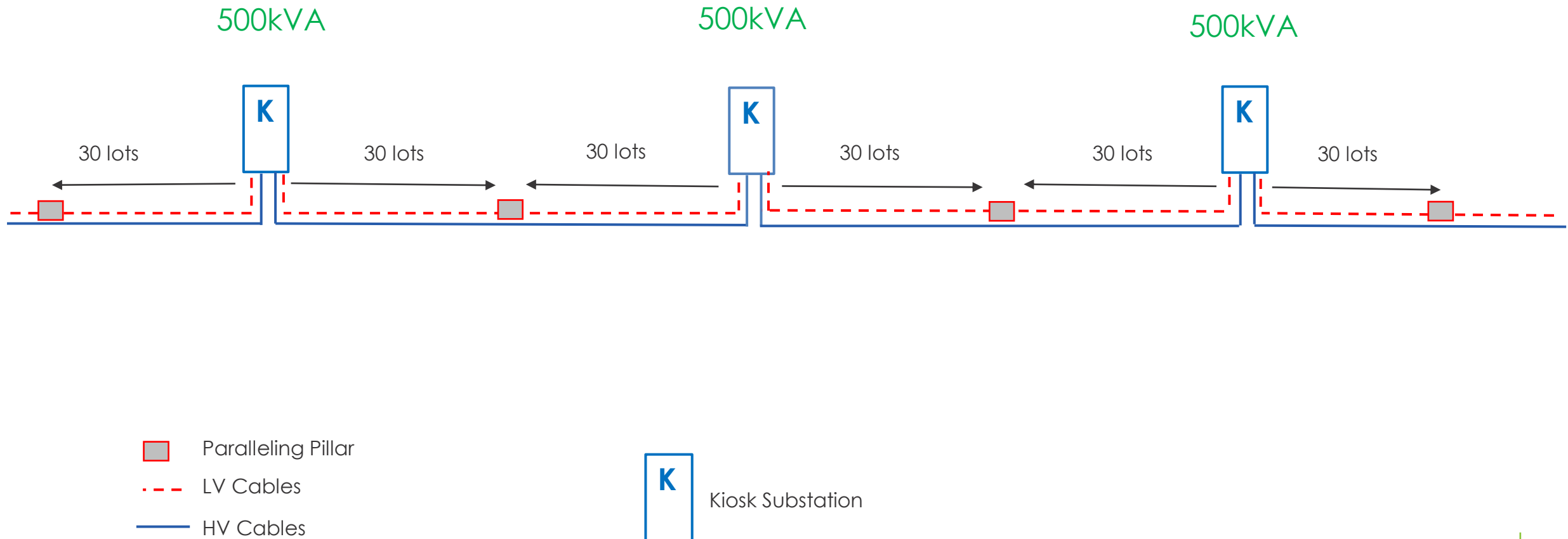
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Ability to respond to customers' changing needs:



Design Approach | Longer-term if/as required

Basics of URD design @ potential 8kVA per lot:



Land requirements for kiosks

- **More kiosk substation sites required** – up to double existing locations
- Where natural gas remains reticulated, **kiosk substation site requirements increases** are needed – around 50% more locations.
- **For transition periods whilst gas remains reticulated**, AusNet will consider options of options for servicing 80 lots per 500kVA kiosk substation.
- **Acquiring land for kiosk substations post housing development** is extremely problematic, costly and highly disruptive to communities and not a viable option. Examples of this can be seen overseas.
- **AusNet intends to assist developers with council planning activities** to allocate space for kiosks adjacent to public reserve areas where acceptable.

Future Reviews of the Design Approach

Moving forward:

- Current studies are based on significant data set from existing connected customers
- The sample size is limited and was a challenge to segregate EV penetration and future consumption patterns of use from traditional load profiles.
- The intention is to review the ADMD criteria every 2 years as consumer use alters over time and technologies emerge.
- We anticipate that the ADMD criteria used for network design in housing estates will most likely alter in the future, however, the design approach adopted now will have flexibility to adapt to change whilst maintaining efficient asset utilisation.

05

Cost Implications for developments

Cost Implications

Costs implications to developers:

- Developers will need to allocate additional land for kiosk reserves
- HV rebates to increase by approximately 20% from 2024 *(to be finalised)*
- HV rebates will apply for additional assets installed including kiosk substations
- There will be a small increase to overall LV circuit cabling required due the additional kiosk connection points

Pros and Cons of design changes

Pros

- HV rebates to increase by up to 20%
- HV rebates will apply for additional HV assets installed including kiosk substations
- Increased kiosk substation footprint should future proof consumption and reverse power flow risks of the distributed energy system - enables more renewables.
- Reduced solar constraints that are currently occurring in housing estate areas
- Impacts of battery penetration is not included in HV rebate calculations
- No gas assets to install in the estate

Cons

- Additional Kiosk sites
- •Challenge of electrical network as sole energy source
- Additional electrical assets required
- Need to revisit overall plans for in flight estates

06

Timing of transition to All-electric estates | responding to market changes

Timing of Transition to full electric design

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Estates in progress:

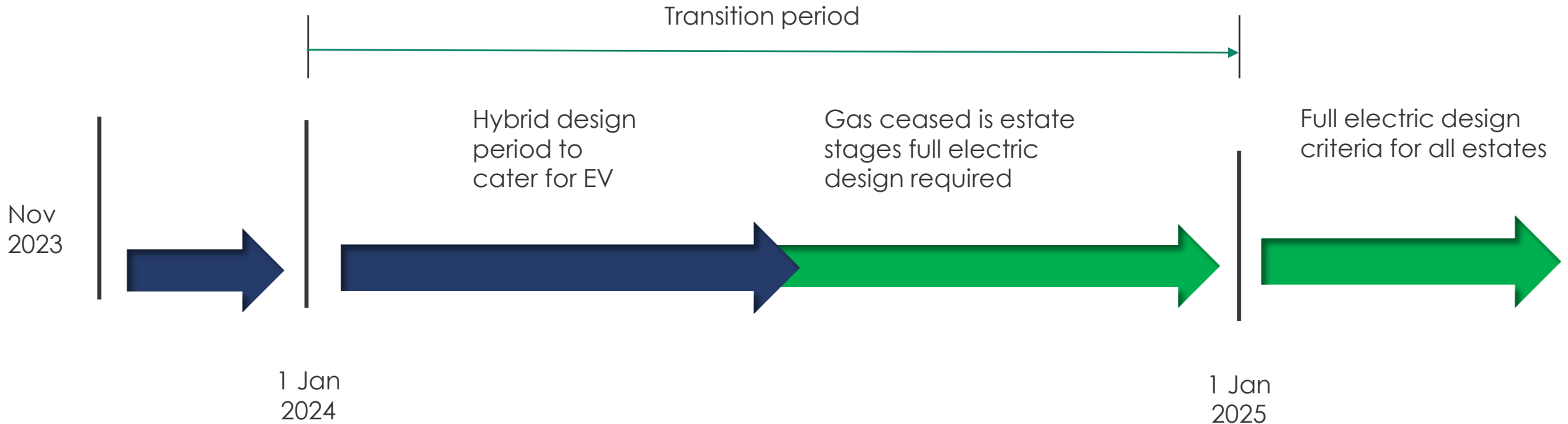
- AusNet will work with developers in good faith for in-flight projects through transition from gas reticulated estates to full electric estates.
- Irrespective of consumer choice to continue using natural gas, we will need to start moving towards catering for EV charging from early 2024.
- Some overall plans may need to be adjusted to allow for a 5.25kVA design – particularly those earmarked for construction in the second half of 2024 where consumer choice about gas usage could change*. * predicting consumer/builder sentiment is a massive challenge
- Designs in transition areas will not be expected to be upgradable to full potential 8kVA
- Full transitions to new design criteria will be mandated once gas reticulation is ceased in a housing estate stage. All future stages beyond will need to meet new design criteria

Full Electric Estates:

- The new design criteria of designed assets upgradable to 8kVA will be mandated once gas reticulation is ceased in housing estates

Timing of Transition to full electric design

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07

REFCL area impacts

Impacts of REFCL areas

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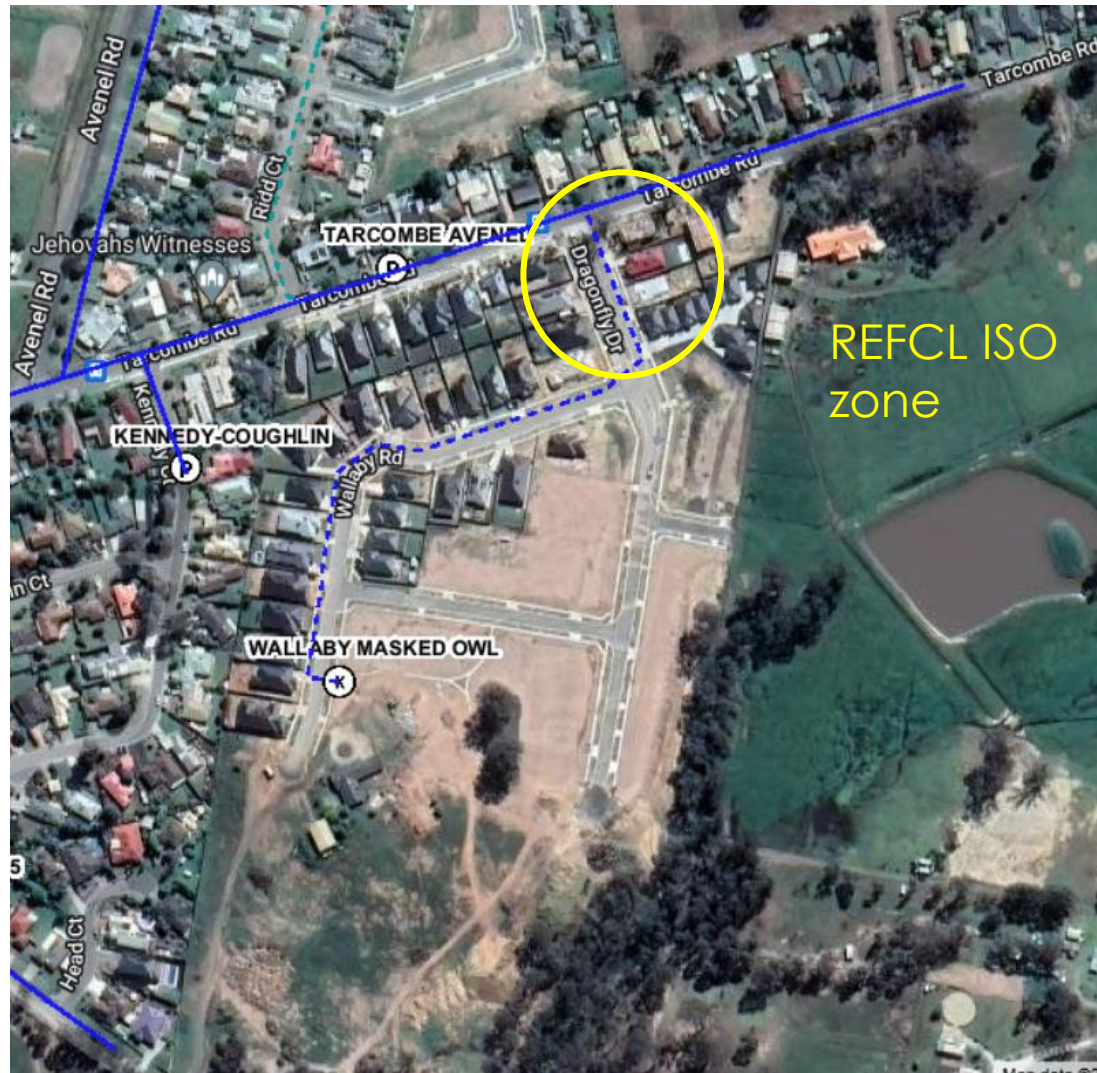
REFCL Isolating transformers:

- Selection of Locations for RECL Isolating transformers (REFCL ISO's) will remain largely unchanged.
- Due to greater electricity demand and installed capacity beyond REFCL ISO's, the need for higher capacity REFCL ISO's will come into play
- AusNet remains committed to minimising the need for REFCL ISO's as far as practical but must comply to government operational rules for REFCL systems

Selecting Isolating transformer locations

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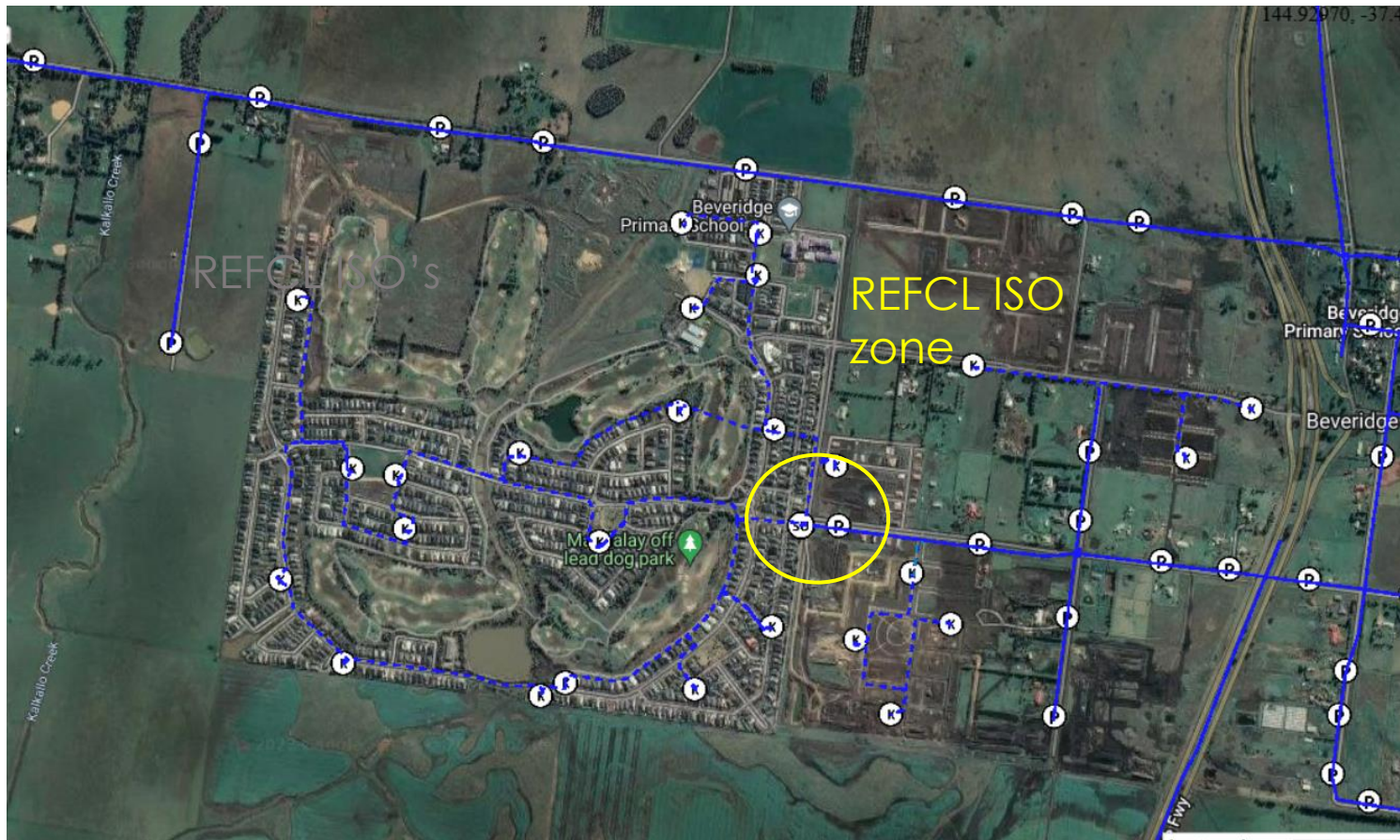
Small developments



Selecting Isolating transformer locations

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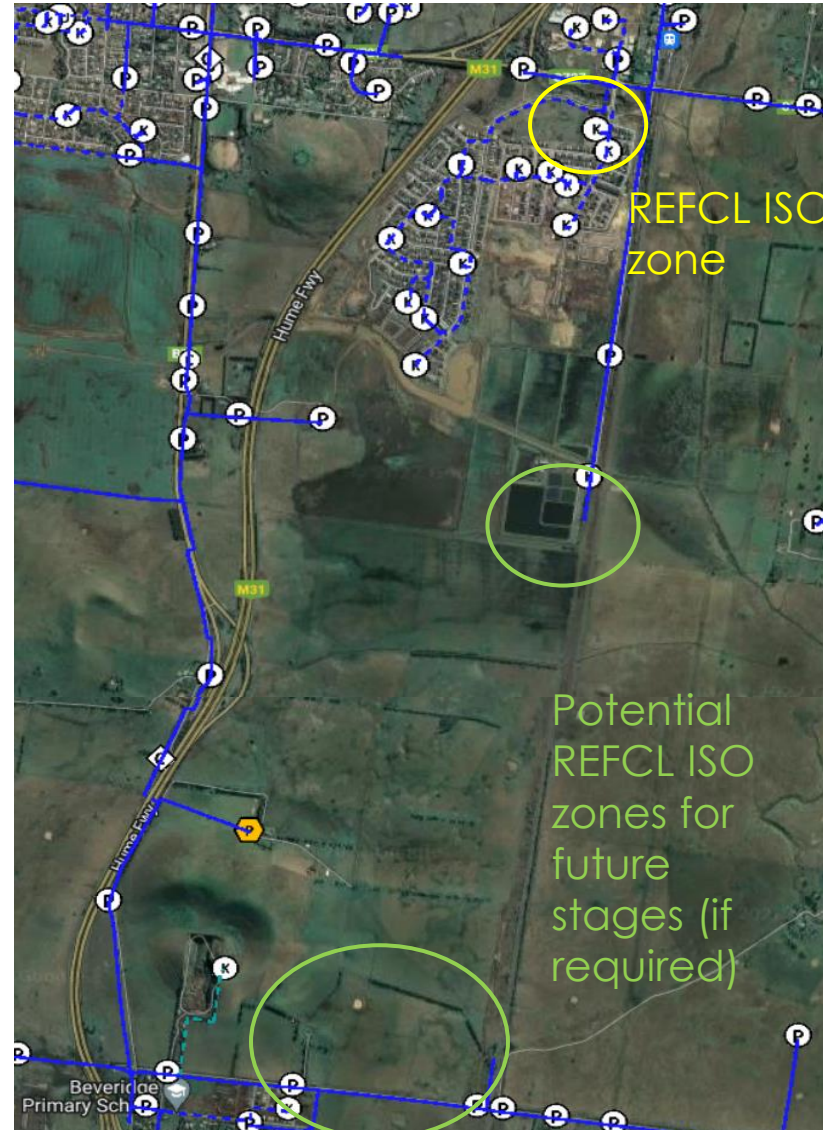
Larger developments



Selecting Isolating transformer locations

AusNet

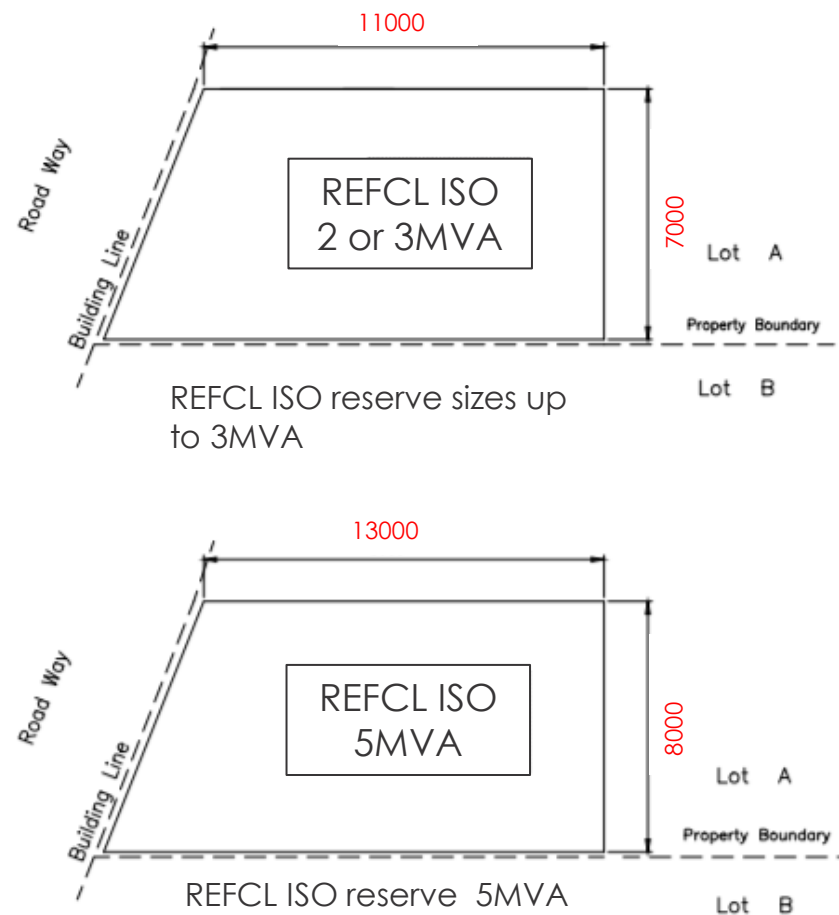
Connected estate placement



CONFIDENTIAL

Isolating Transformer Reserve size in Estates

Ground Mounted



Requirements

A double brick (or similar) fire rated boundary wall 1.8m high is required where the reserve boundary abuts a residential allotment. **

Crushed rock base or asphalt surrounding ISO.

** without fire rated walls reserve size would need to be increased by at least 3m in all directions

Aesthetic considerations

- AusNet recognises that the REFCL Isolating transformers are **considerably larger than any kiosk substation** used to date.
- AusNet also recognises the need for estate entries to be **attractive to the public**.
- AusNet is willing to **work with the industry** to find ways to enhance the look of these necessary assets and incorporate them into estates in a sensitive way.



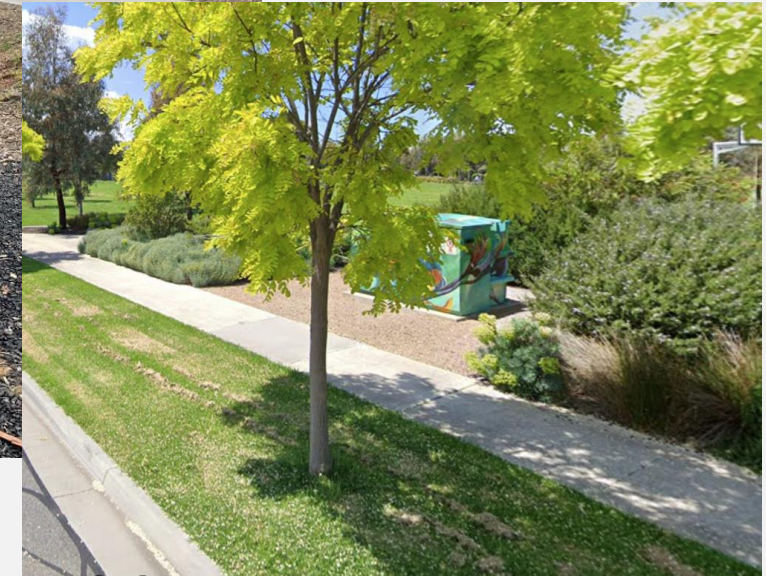
08

Improving aesthetics of kiosk substations

Vinyl Wrap kiosks

To assist with site aesthetics and increased volume of kiosks in public spaces AusNet are considering allowing visual improvement options subject to:

1. Being in a public open space
2. No writing or advertising allowed
3. Land owner (council) endorses and accepts ongoing responsibility via written agreement
4. Applicant arranges and finances full cost of installation
5. Applicant pays fees to cover future removal costs (e.g. vandalised or deteriorated covering)
6. AusNet approves the wrap imaging prior to installation



Would you like to get involved?



If you would like to:

join the Developer Consultative Committee

- Forum to raise and discuss opportunities for improving the greenfield connection process
- Meets quarterly

suggest opportunities for improving the greenfield connections process

or

suggest topics for a “deep dive” industry briefing

... please reach out to Lucy Holder at engagement@ausnetservices.com.au

For developers
on our **electricity**
network

AusNet

AusNet Services

Level 31

2 Southbank Boulevard

Southbank VIC 3006

T +613 9695 6000

F +613 9695 6666

Locked Bag 14051 Melbourne City Mail Centre Melbourne VIC 8001

www.AusNetservices.com.au

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@AusNetServices



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Thank You

