EV Connect

Industry Webinar

Creating visibility to help plan for and support the uptake of EVs

6 & 10 June 2024

HORIZON POWER

Acknowledgement of Country

Ngala kaaditj Whadjuk Noongar moort keyen kaadak nidja boodja.

~

We would like to acknowledge the Traditional Custodians of this land, the Whadjuk people. We recognise and appreciate a continued connection through stories, traditions and living cultures and commit to building a brighter future together.
And we extend this respect and acknowledgement to the lands on which Horizon Power operate, and those in which our audience is viewing.

Contents

HORIZON POWER

Horizon Power at a glance

2.3m square km
of regional and remote WA is serviced by Horizon Power

562
Employees*

53,190
customer connection points to network*

1,020 GWh
electricity delivered a year*

8,498 km
of overhead and underground transmission and distribution lines*

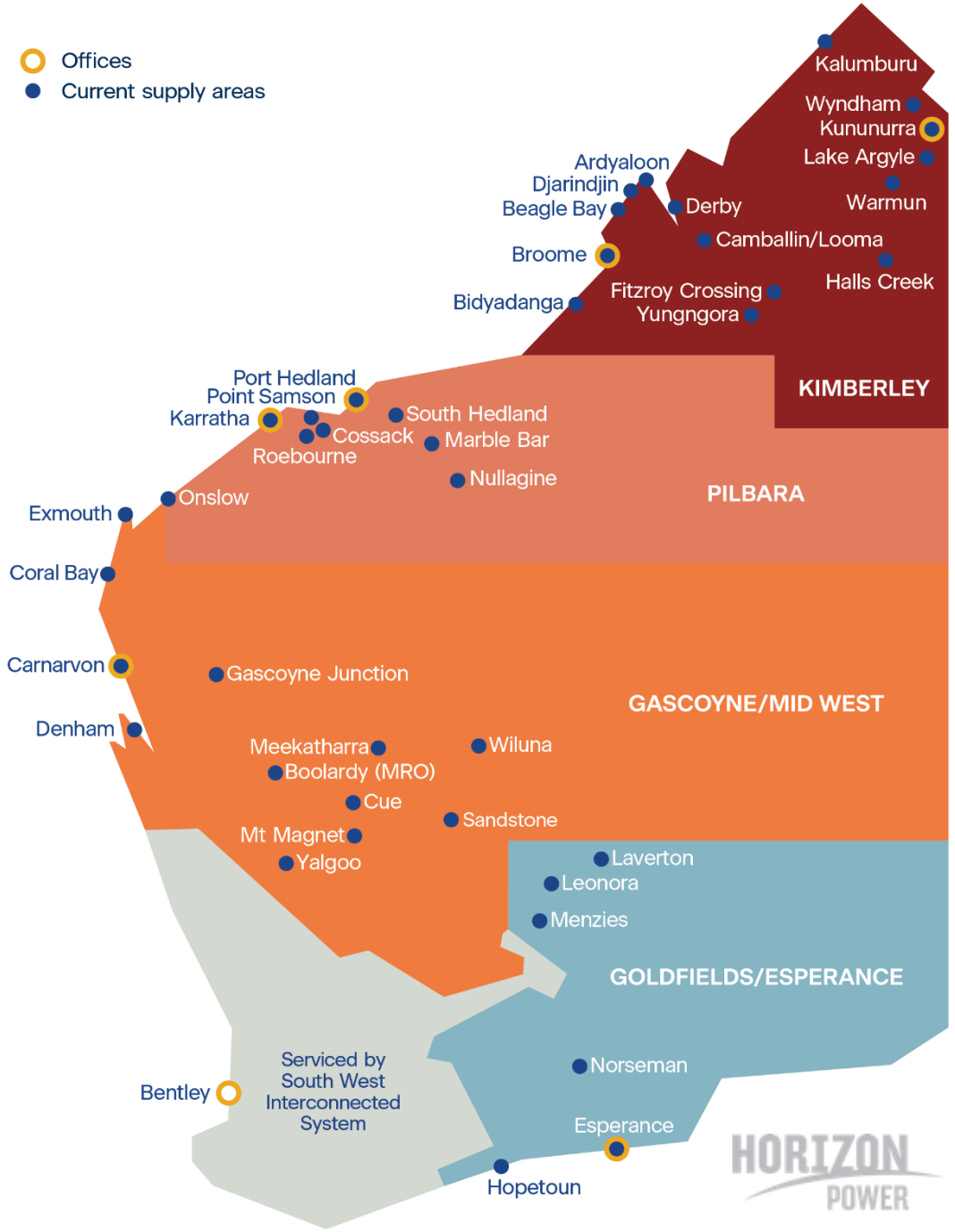
78 stand alone power systems
(SPS) installed

3 energy types
gas, diesel, and renewable energy (wind, solar, and hydro)

23.02 GWh renewable energy
purchased from our customers*

0.55 kgCO2-e/kWh
carbon emissions*

*Based on Annual Report 2022/23



Horizon Power's Purpose is to deliver clean energy solutions for regional growth and vibrant communities

Our Corporate Guiding Principles

Community involvement

Listening, creating, and delivering together.

Aboriginal and Torres Strait Islander commitment

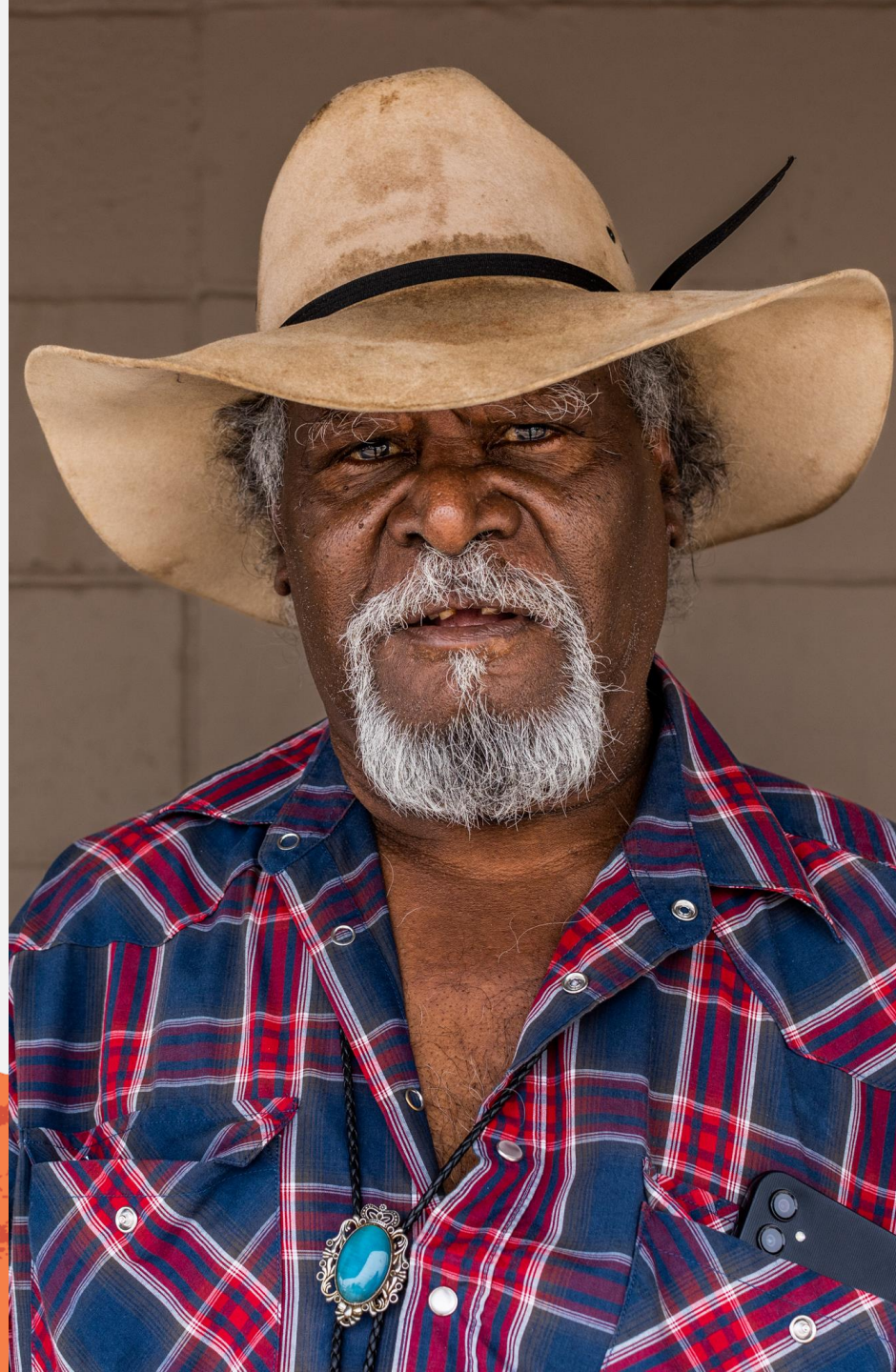
Positive impact on Aboriginal and Torres Strait Islander customers, suppliers, employees and communities.

Cleaner, greener

Improving our shared environment.

Regions first

Preference towards local people, goods and services.



Our commitment to the State Government's goal of being net zero by 2050

We are committed to working together towards a climate-resilient and prosperous low carbon future for our communities

Reduce public sector emissions by

80%
by 2030*

*compared to 2020 levels

WA's transition to a low-carbon economy is a collaborative journey. We recognise our unique position in this transformation as a vertically-integrated electricity utility, operating across the full energy supply chain with generation, transmission, distribution and retail services.

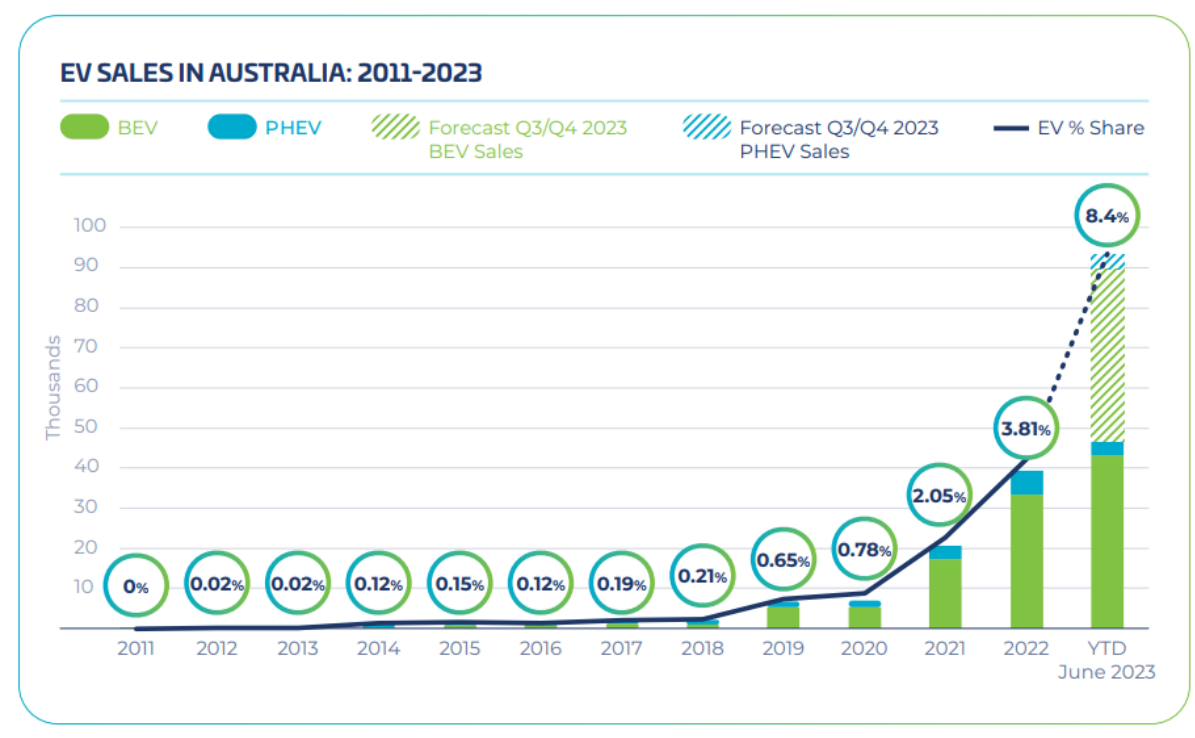
Net zero
by 2050

We are committed to increasing renewable energy generation wherever viable, balanced with the urgency of delivering our decarbonisation goal, the challenges of large-scale renewables infrastructure and the sensitivity required for cultural, environmental and economic considerations.

HORIZON POWER

Interest in EVs is growing

We asked customers about their purchase interest and intent in EVs



EV Car ownership

51 registered in regional WA

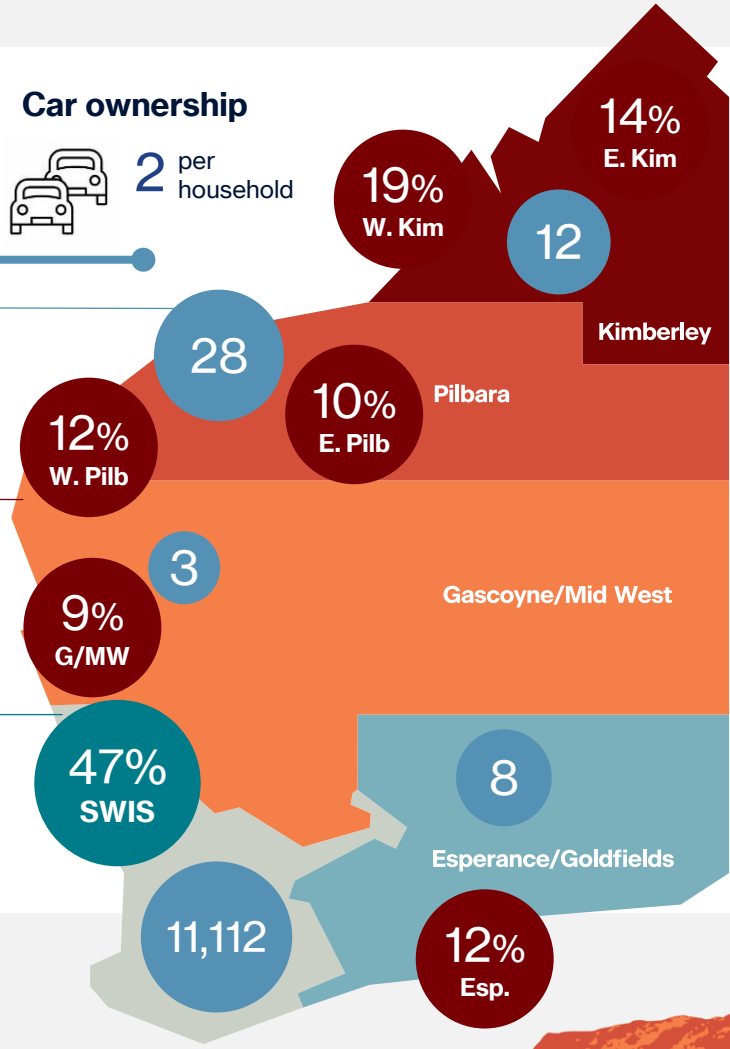
Car ownership

2 per household

Department of Transport registered numbers of EVs

% of customers who already have or intend to buy an EV in the next 5 years

% of non-EV owners in the SWIS who are currently buying or intend to buy an EV in the next 5 years



Source: State-of-EVs_July-2023_.pdf (electricvehiclecouncil.com.au)

WA EV Network

Delivering fast charging infrastructure

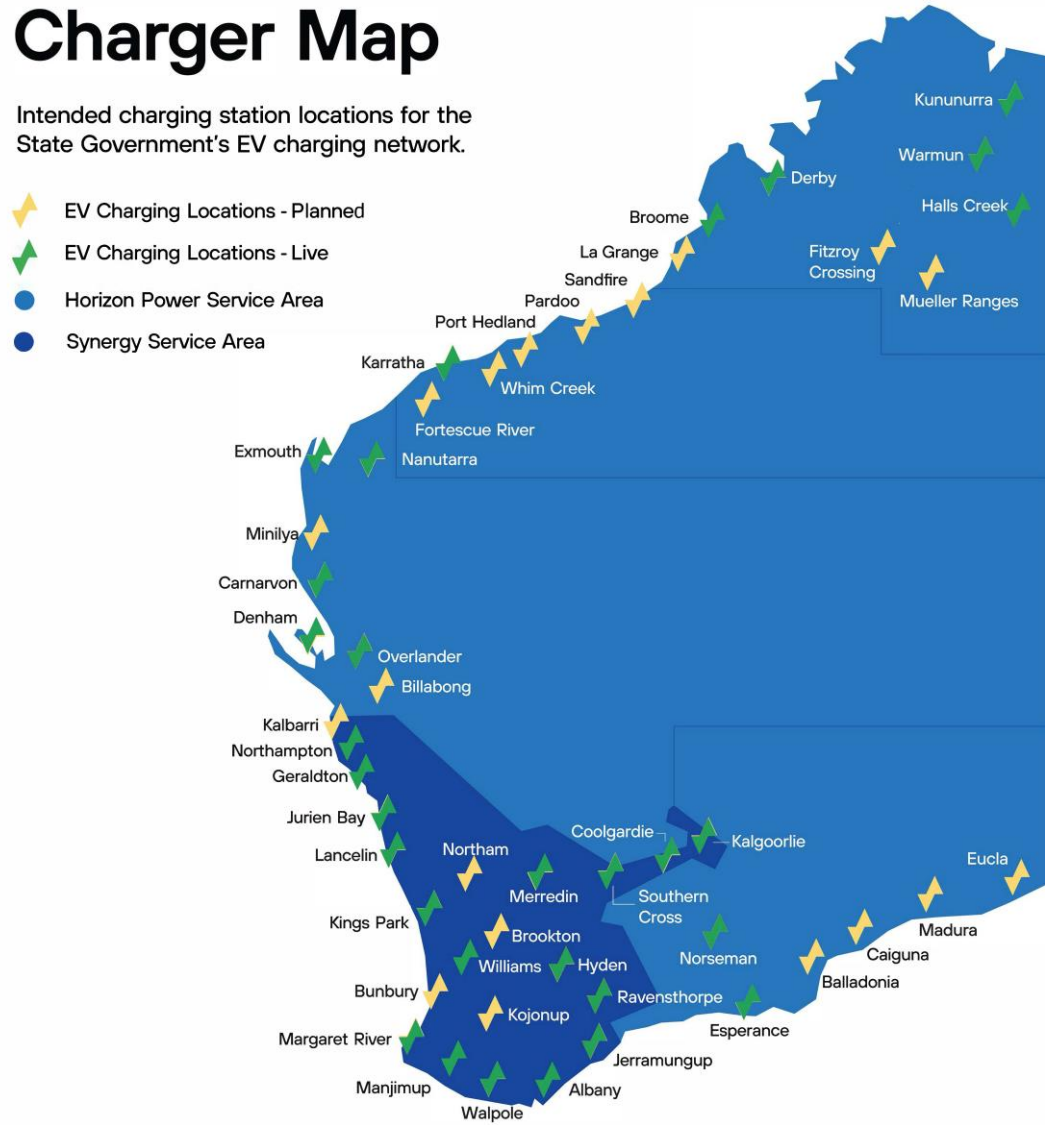
- Joint project delivered by Horizon Power and Synergy
- 98 Charging Stations across 49 locations
- An average of 200 km apart
- Australia’s longest EV fast-charging network – connects 7,000+ kms

powered by HORIZON POWER + synergy

WA EV NETWORK

Western Australia Electric Vehicle Charger Map

Intended charging station locations for the State Government's EV charging network.

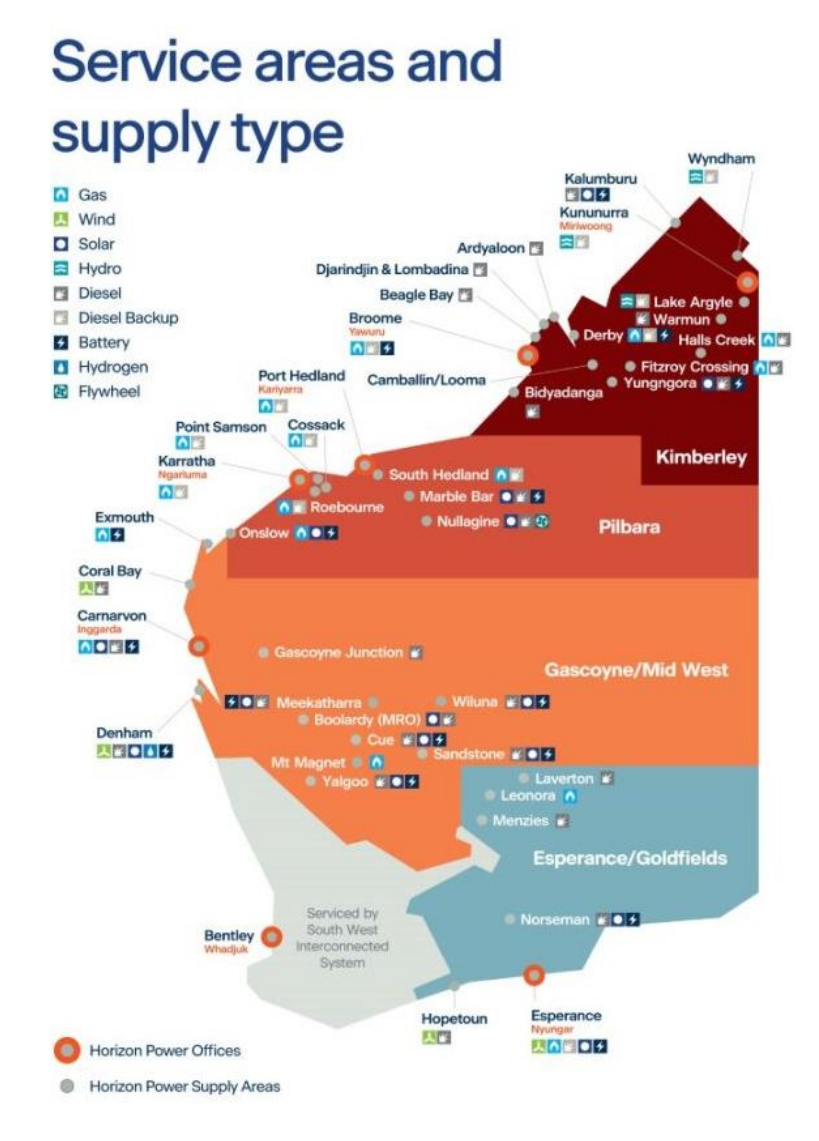


Contents

HORIZON POWER

Horizon Power networks vary considerably in network capacity and supply type

Smaller networks with variable supply types adds complexity



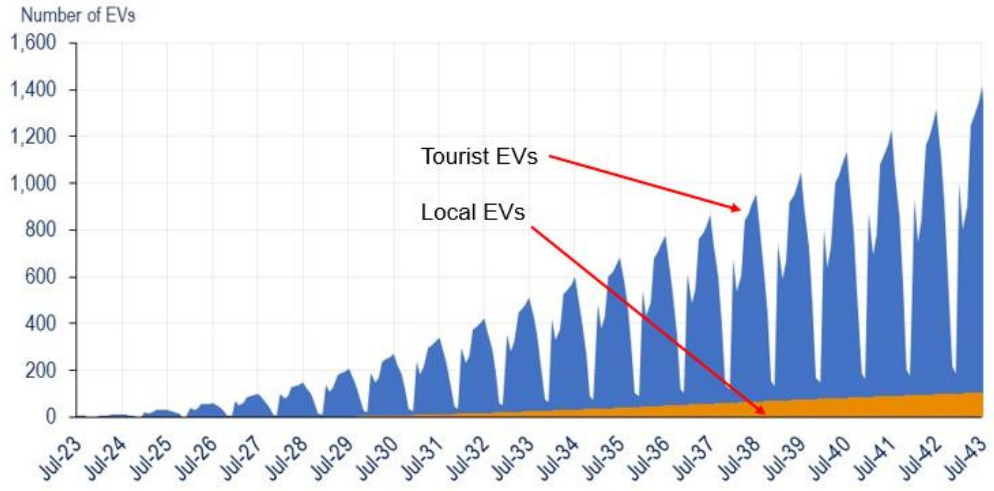
- Town peak demand ranges from 30MW to 200kW
- 17 towns with a network peak of < 1MW

The split of local and tourist EV users will vary across towns

Local and tourist EV drivers will have different charging habits and expectations placing unique challenges in maintaining network reliability

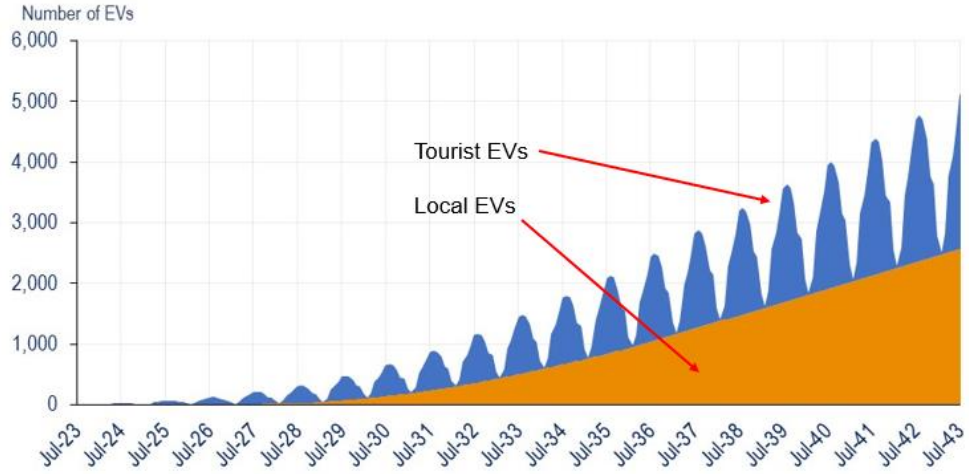
Scenario 1: Smaller networks

- Low local EV ownership
- Inflow of tourist EVs creating additional “peaky” EV charging demand



Scenario 2: Larger networks

- High local and tourist EV numbers
- Steadily increasing local charging demand combined with “peaky” demand during tourist inflow



HORIZON POWER

Tourist EV charging demand spiking during school holidays

Demand spikes from EV charging requires careful system planning to ensure network reliability

Tourist and school holiday seasons

- Inflow of tourist EVs during seasonal travel and school holidays
- EV users will be seeking to charge from a variety of sources
    - Public fast chargers
    - Destination chargers (restaurants, shops, attractions)
    - Charging at accommodation provider
    - Charging at home
    - Alternative public options (e.g., PlugShare sites)

Key Concept: Network peak demand

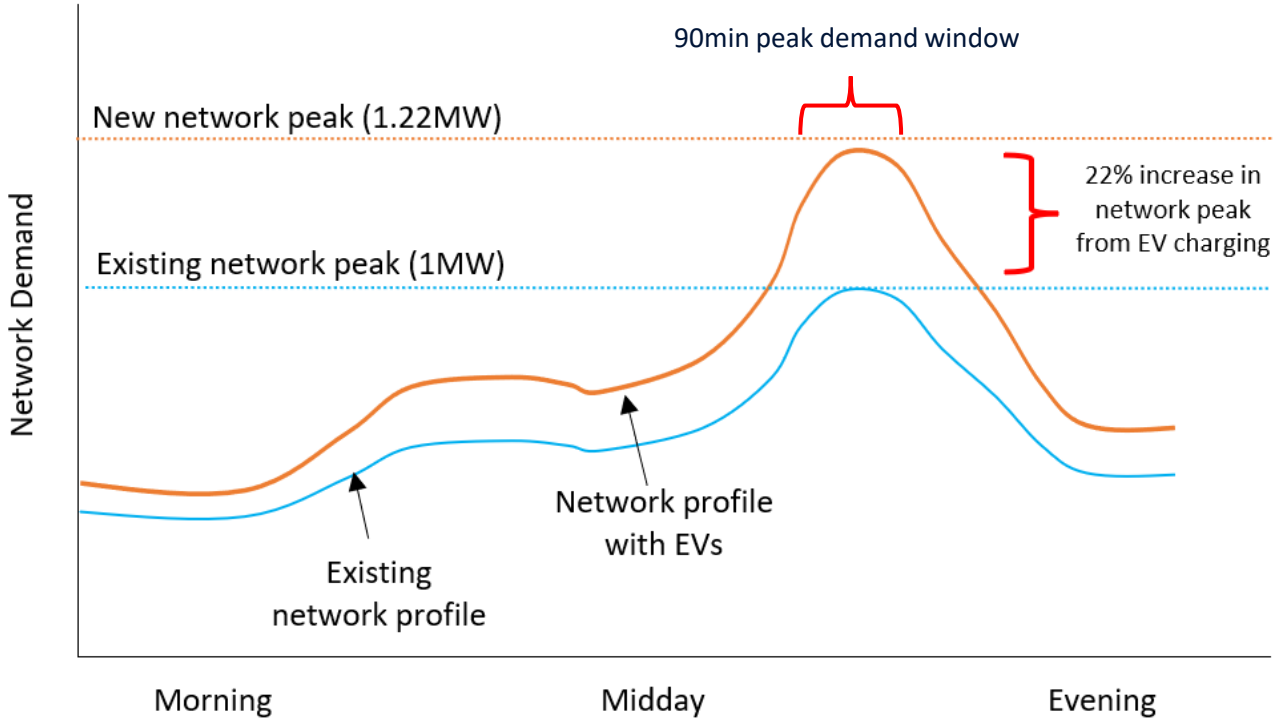
When increased EV charging, extreme temperatures, and unusually high town load is coincident, an unusually high peak demand event may occur.

Impact of EV charging example:

- A town with 1MW capacity has 20 EVs charging during afternoon peak
- Towns peak increases to 1.22MW or by **22%***

Unusually high town load may be the result of:

- Severe temperature and humidity
- Peak tourist season, including school holidays
- Larger commercial or industrial loads



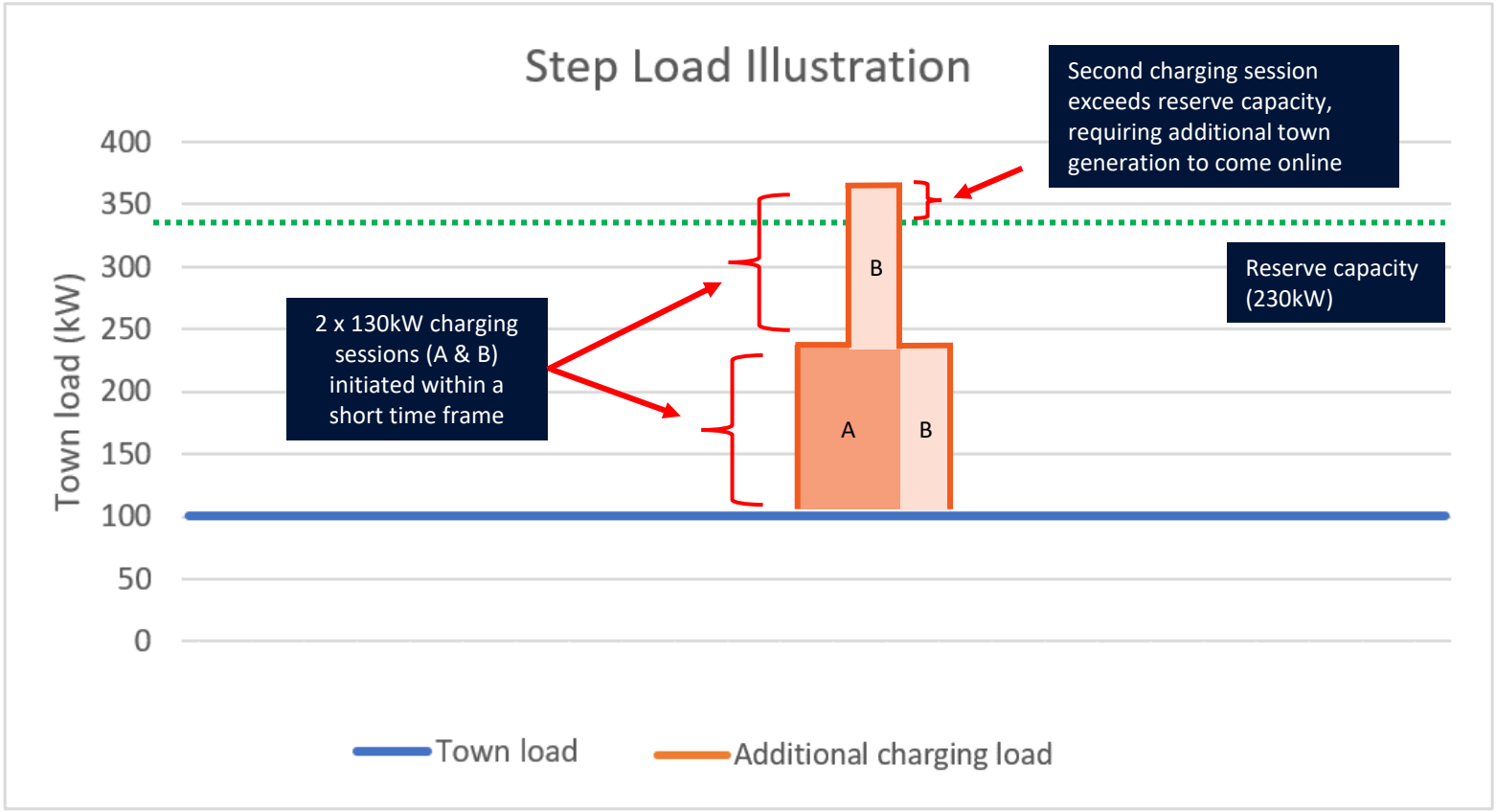
*Assumes 11kW EV charging

Key Concept: Network step load

Sudden step load increases on smaller networks can create system instability

Simple illustration of step load

- 2 x EV drivers initiate overlapping charging sessions (130kW each)



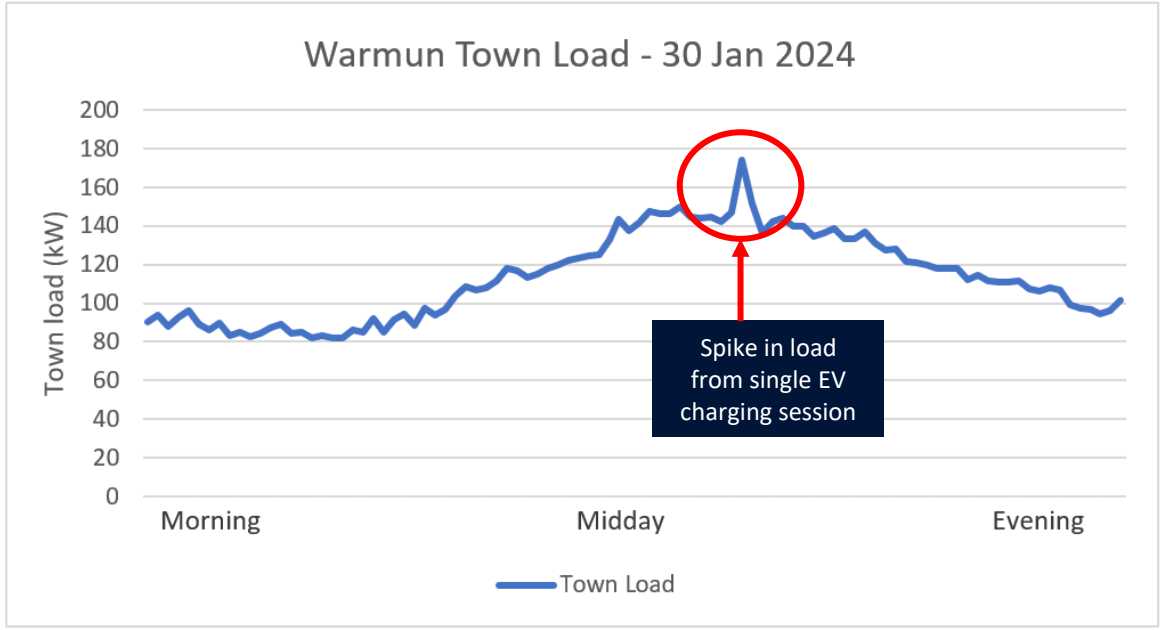
Case Study: EV Charging in Warmun

Town load impact from single charge session on the WA EV Network (30 Jan 2024)

Warmun Key Statistics

- 200km South of Kununurra
- 130km to the to the Purnululu National park (Bungle Bungles)
- 157 metered connections
- 12th smallest Horizon Power town

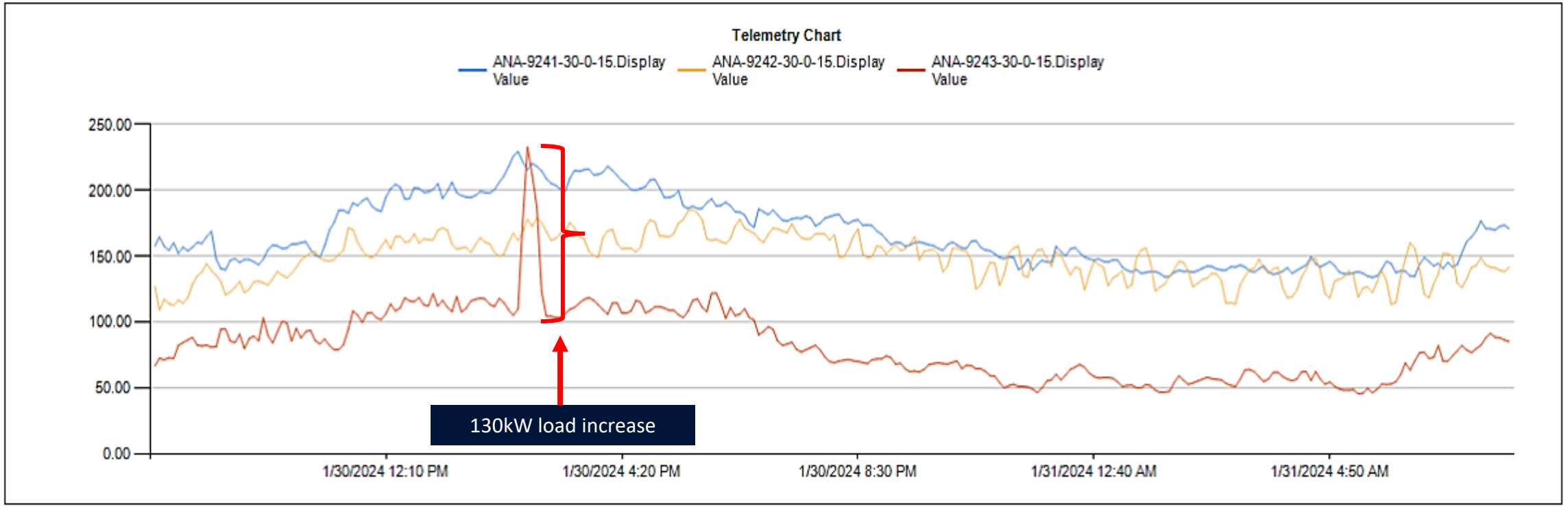
Town load impact from a single charging session



Case Study: EV Charging in Warmun

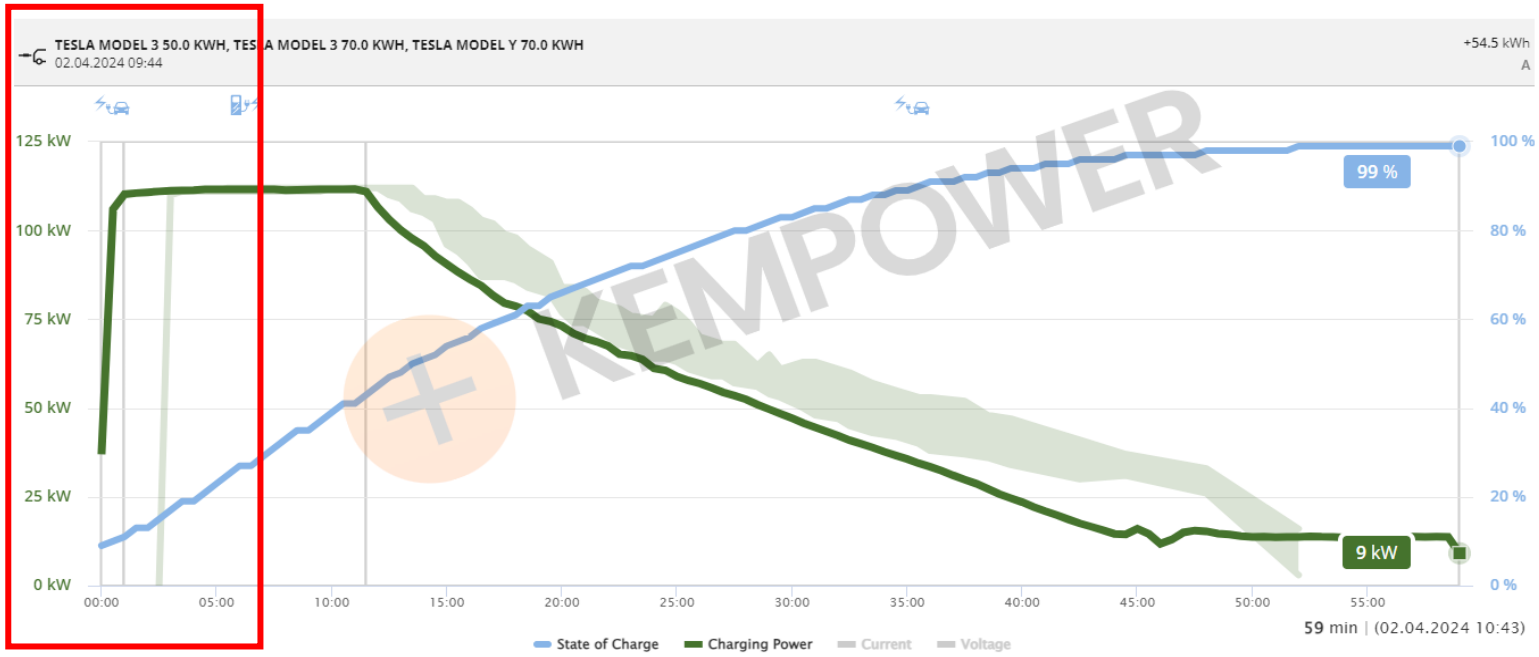
Increase town load upon start of EV charging session

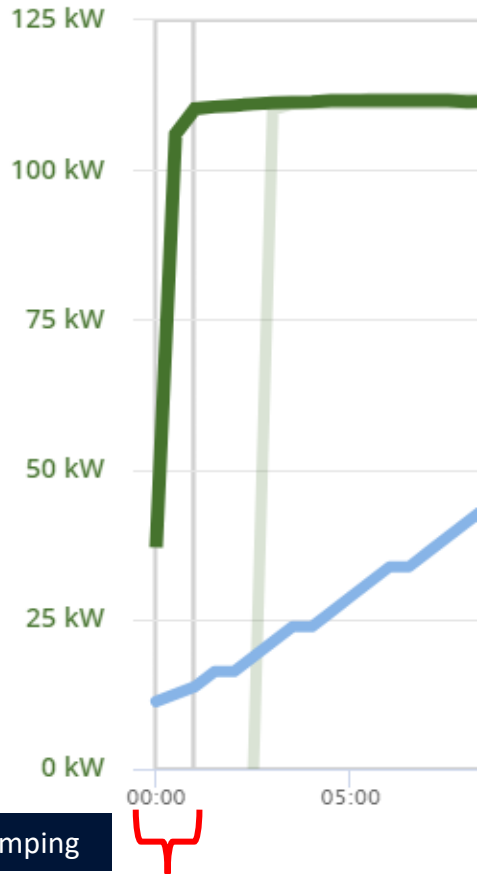
Power generation for the three high voltage feeders in Warmun



Ramp rate capability can help to soften the step load impact

Average charging profile for Tesla Model 3 across WA EV Network





30 seconds ramping

Contents

HORIZON POWER

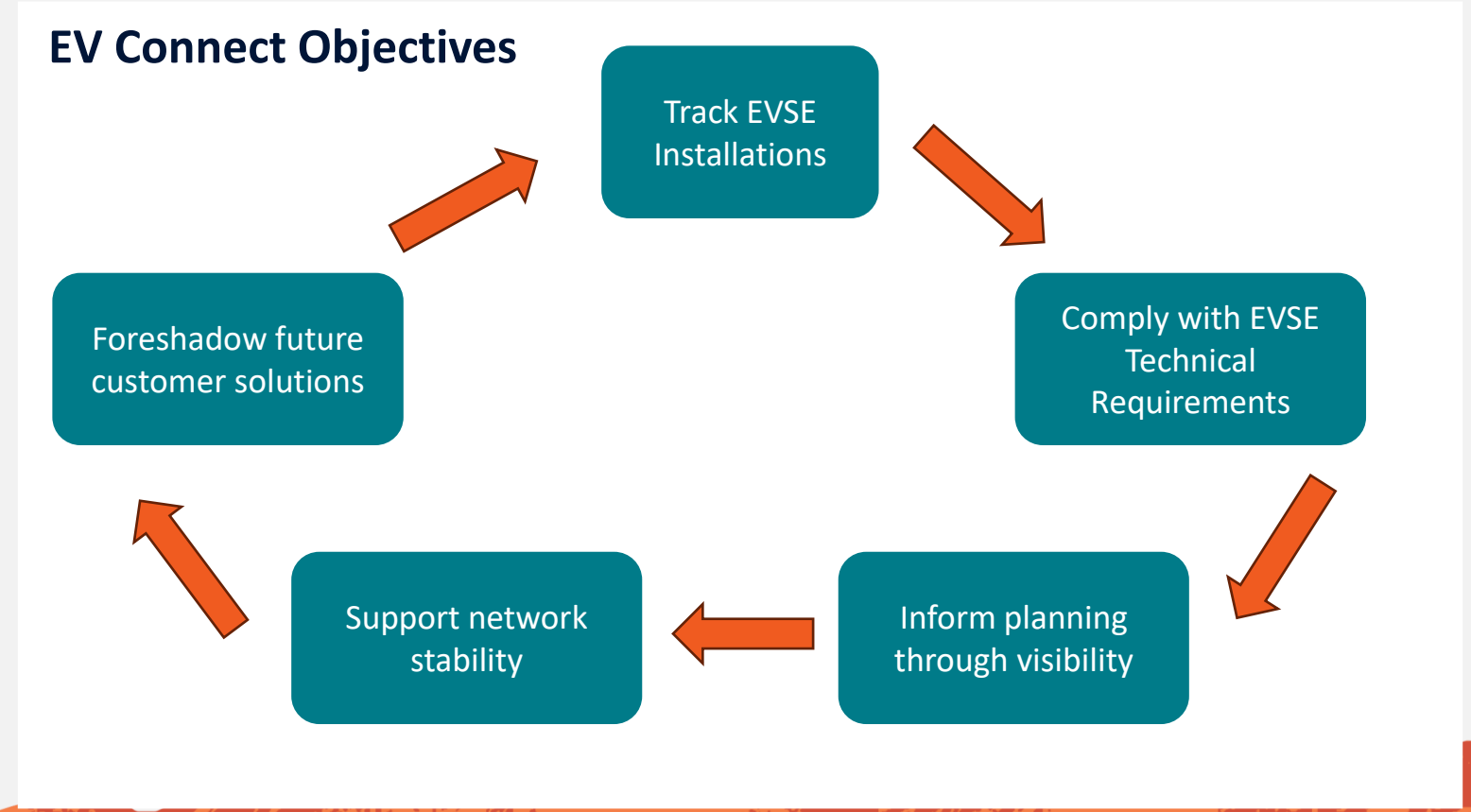
There are various ways EV users will charge their car

Type	Sample Capacity	Use case	Benefits	Draw backs
Level 1 (L1)	2.4kW	Standard power point	• Standard issue with most EVs • Power sockets readily available • Lower cost	• Slow charging • No smart control capability
Level 2 (L2)	Up to 23kW	Wall mount smart charger with a dedicated circuit	• Faster charging • Charging times configurable via app • Option to coordinate charging via rooftop solar • Option for a dynamic connection responding to household load	• Additional hardware and installation costs • Potential underutilisation of capacity if a larger charger is installed (e.g., 22kW), but limited by the smaller onboard EV inverter (e.g. 11kW)
Level 3 (L3)	>23kW	Public charging	• High-powered fast charging	• Reduced charging availability during tourist season • Higher cost (pending the site) • Increased potential requirement for network augmentation

HORIZON POWER

EV Connect

A new online process to capture details of L2 and L3 EVSE installations

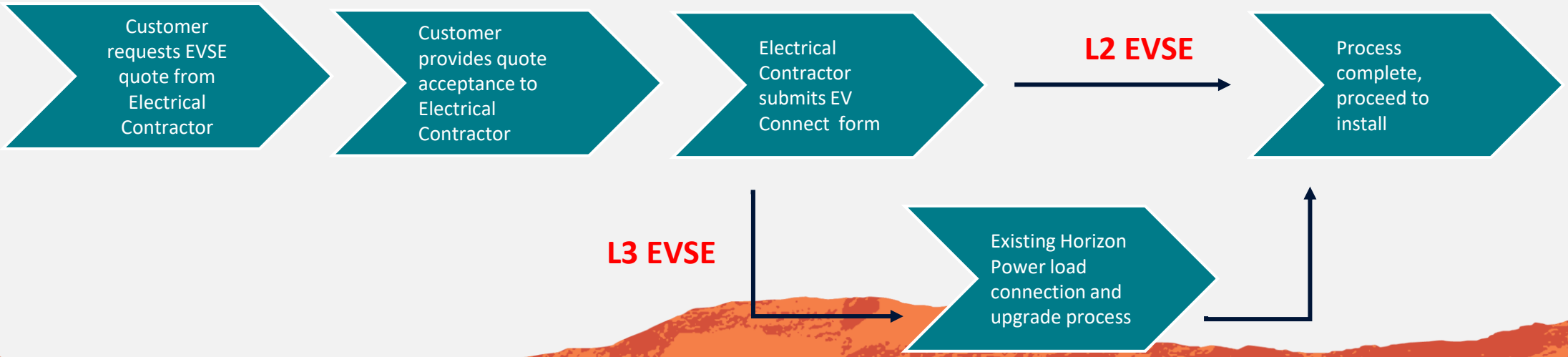


The EV Connect online form is completed by electricians

Only L2 and L3 charger installations require an EV Connect online submission

- Level 2 EVSE (< 23kW) = registration path only
- Level 3 EVSE (> 23kW) = follow the existing Horizon Power load connection and upgrade process

Summary of EV Connect Process



HORIZON POWER

Contents

HORIZON POWER

EV Supply Equipment Technical Requirements

Some new requirements apply to L2 and L3 chargers

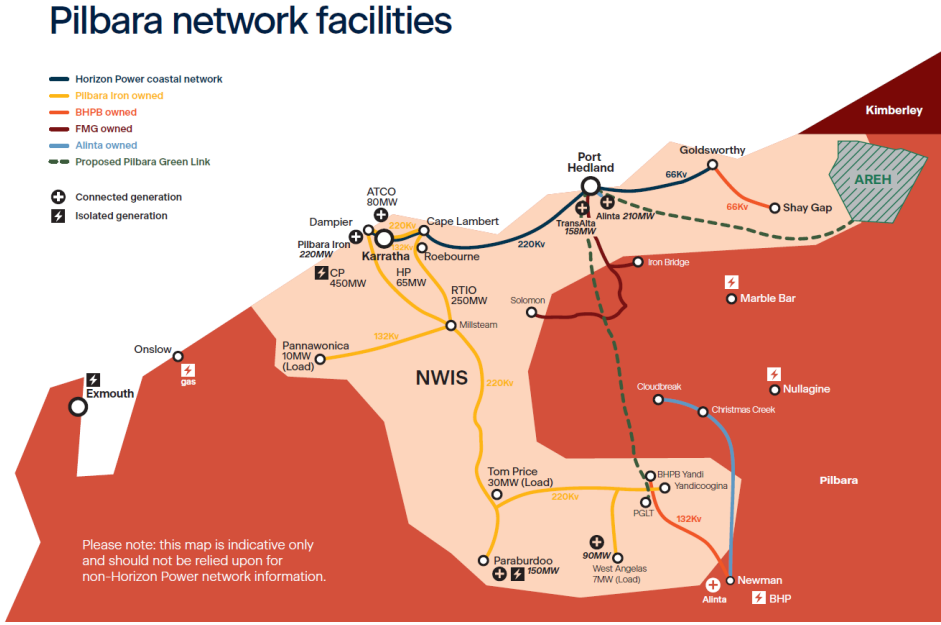
Type	Sample Capacity	Technical Requirements
Level 1 (L1)	Up to 2.4kW	• Comply with relevant codes and standards (eg IEC 61851.1, WAER, AS3000, WASIR) • Ensure installation is within connection capacity (eg standard supply 32A three phase, 63A single phase) • Vehicle to Grid / Building capable systems must also meet the EG Technical Requirements
Level 2 (L2)	Up to 23kW	• Comply with relevant codes and standards (eg IEC 61851.1, WAER, AS3000, WASIR) • Ensure installation is within connection capacity (eg standard supply 32A three phase, 63A single phase) • Register EVSE with Horizon Power • Vehicle to Grid / Building capable systems must also meet the EG Technical Requirements
Level 3 (L3)	>23kW	• Comply with relevant codes and standards (eg IEC 61851.1, WAER, AS3000, WASIR) • Ensure installation is within connection capacity • Apply to Horizon Power to connect EVSE, EVSE assessed for Network Impacts • Comply with the ramp rate requirements (30 seconds in non-NWIS towns) • Vehicle to Grid / Building capable systems must also meet the EG Technical Requirements

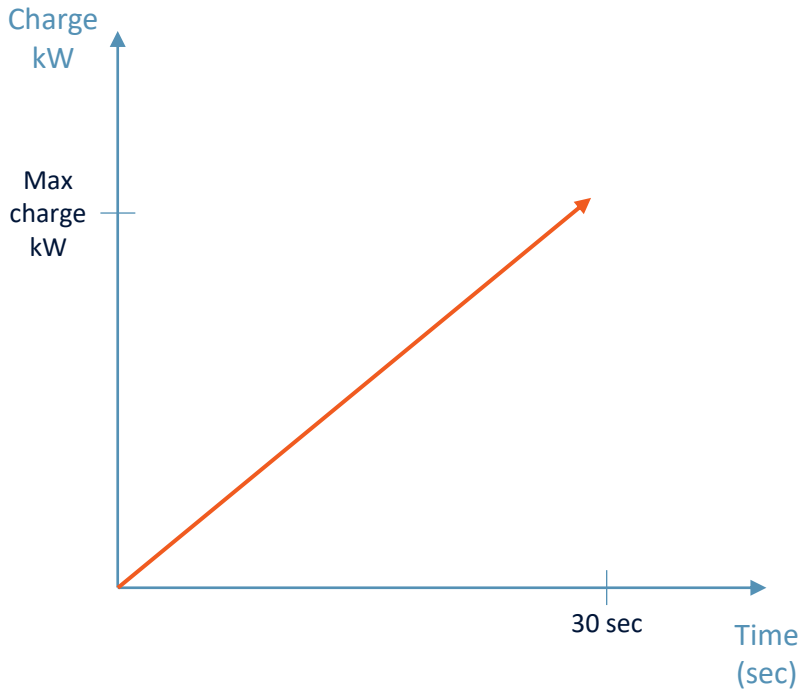
HORIZON POWER

EV Supply Equipment Technical Requirements

Ramp Rate Control for Level 3 EVSE

- All Level 3 EVSE shall have ramp rate control – except L3 EVSE in the Pilbara network
  - Dampier, Karratha, Cape Lambert, Roebourne, Point Sampson, and Port Hedland.
- Ramp rate control requires that the charger output is ramped to achieve maximum output over 30 seconds.
- Ramp rate control is to be performed locally.
- Ramp rate time of 30 seconds is to be configurable.
- Ramp rate control must function during times of network (internet) outages.





HORIZON POWER

EVSE Energy Management (non-mandatory)

Horizon Power predicts a future that may include orchestration of EV charging

Horizon Power's experience with DER orchestration:

- 2016 - Carnarvon DER trials
- 2018 – SmartSun Broome VPP trial
- 2019 - Onslow DERMS trial
- 2024 - Smart Connect Solar
- 2024 - EV Orchestration Trial

Horizon Power recommends that L2 and L3 EVSE have the capability for:

- Open Charge Point Protocol (OCPP); or
- An API for direct communication with Horizon Power DERMS
- An Authorised Agent to manage communication with Horizon Power DERMS

HORIZON POWER

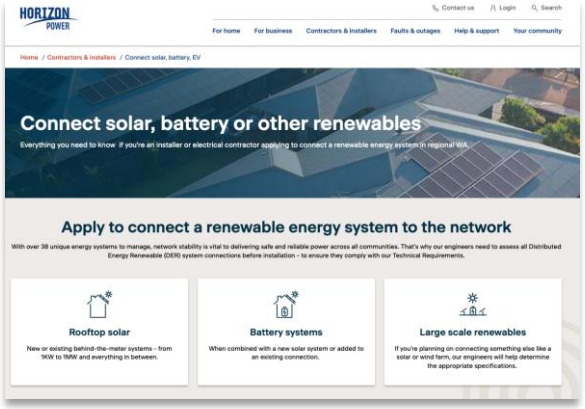
Contents

HORIZON POWER

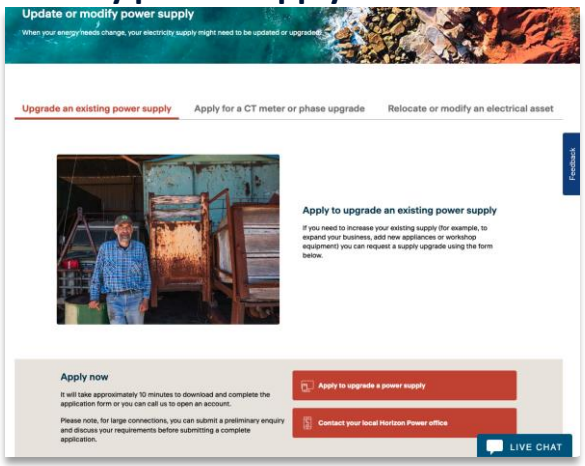
EV Connect – Contractor pathways

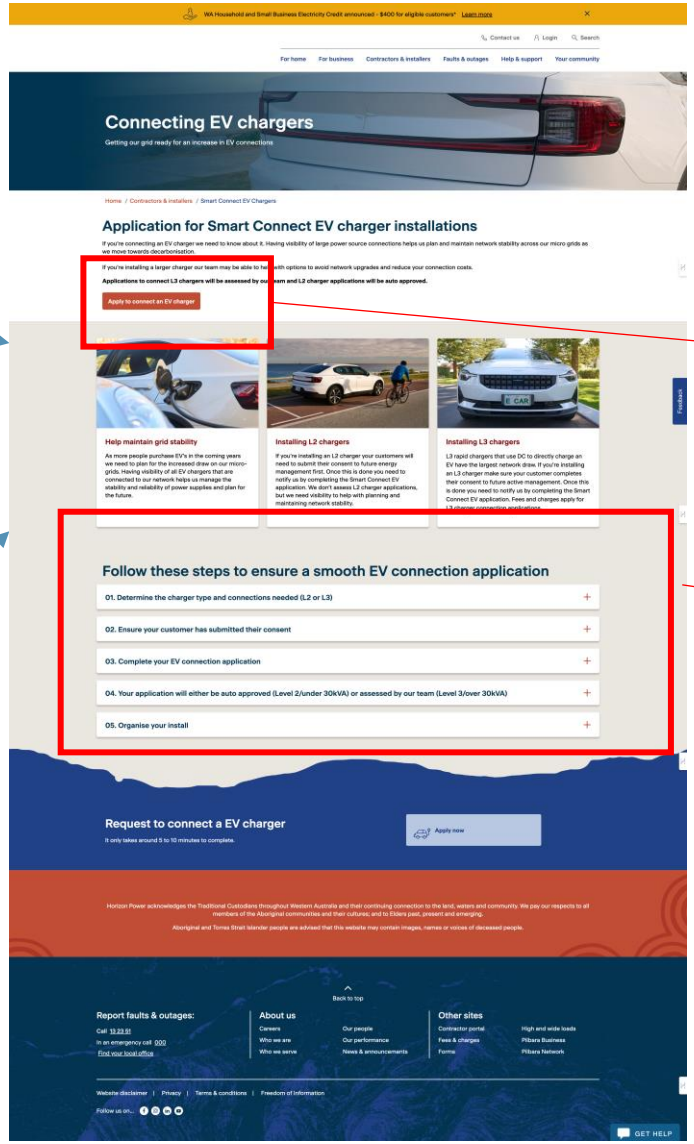
Streamlining EV Connect submission through two pathways

Contractors & installers> Connect solar, battery, EV



Contractors & installers> Upgrade or modify power supply





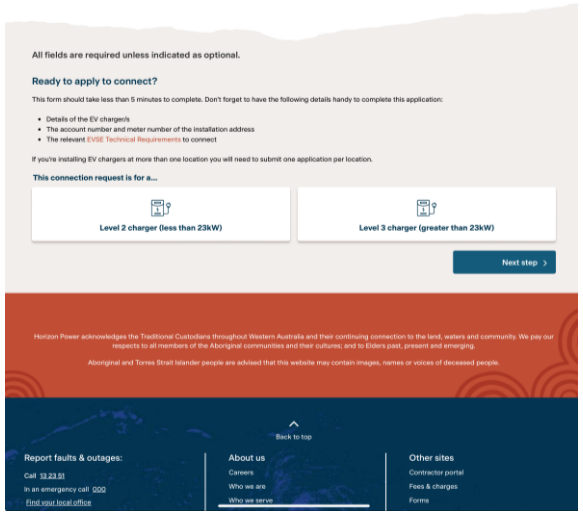
Web content is updated on the contractors and installers section of the website

Link to EV Connect form

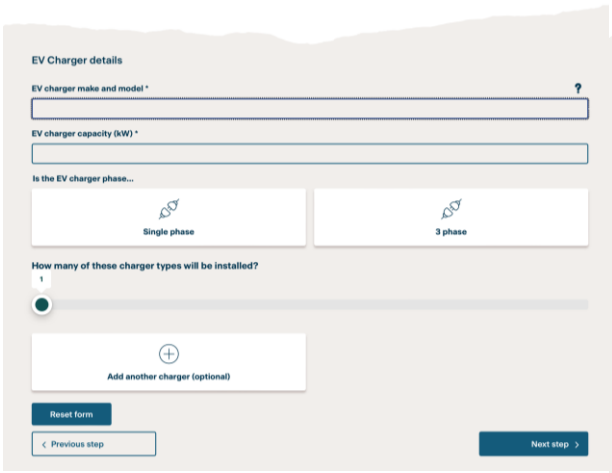
EV Connect frequently asked questions

EV connect – Contractor application form

Step 1

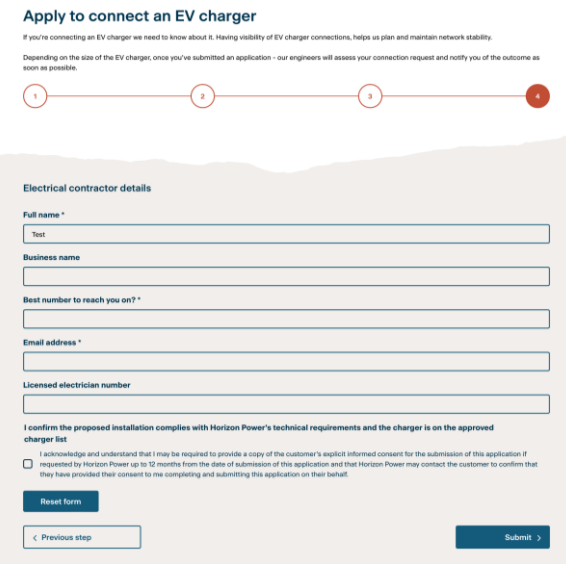


Step 2

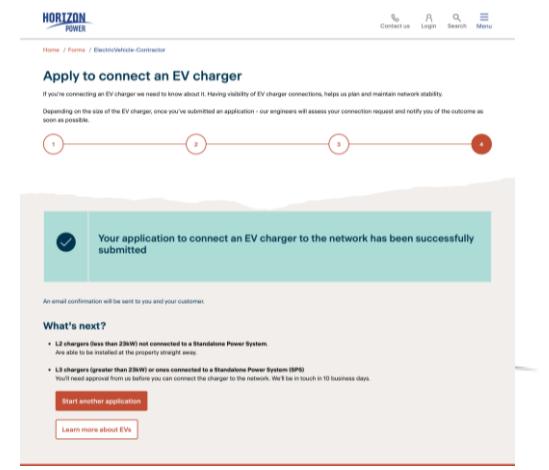


Step 3

Step 4



Completion



Contents

HORIZON POWER

Key Dates and Next Steps

Item	Date
• EV Connect Webinar #1 • Release of EVSE Technical Requirements	6 June 2024
• EV Connect Webinar #2 • Beginning of consultation period	10 June 2024
End of consultation period	25 June 2024. 9am AWST
EV Connect launch	27 June 2024. 9am AWST

Thank you for your attendance

Contact us:

EV Connect

EV @ horizonpower.com.au

HORIZON POWER