Tasmania's EV Charging Network
Looking back, looking forward

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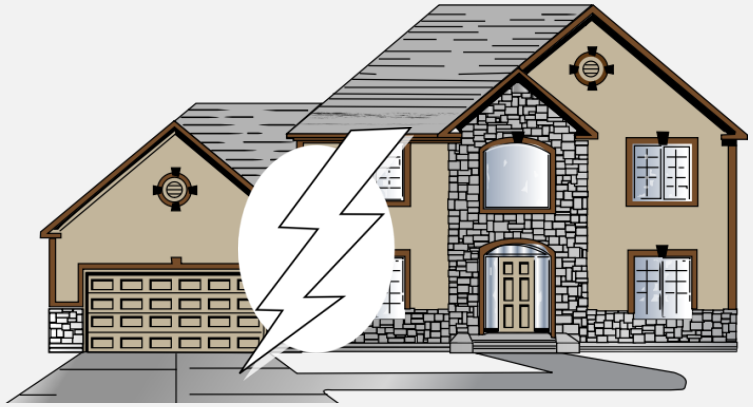
Australian Electric Vehicle Association

Context



- Charging at home, fleet base or accommodation while away will provide 90%-98% of all EV charging
- But when the trip length exceeds the EV battery's range, you need a charge network
- Destination chargers can provide useful top up if charging for an hour or more
- Highway chargers (fast chargers) charge on demand asap to extend range for longer journeys

Looking back

2015

- Jan - one EV charger in Tas – Nissan dealer in North Hobart (ChargePoint)
- July – Tas AEVA branch launched
- Lots of power points! AEVA members start to recruit opportunistic charging sites
- 18 Nov – Anvers Chocolate first public charger – Tesla +
- 27 Nov – Electric Highway Working Group formed to plan a charge network

Early concept:

- 4 x 50 kW DC
- 25 x 25 kW DC
- Lots of AC

Australian Electric Vehicle Association aeva.asn.au

Electric Highway Tasmania – Concept

October 2015

The Problem

Overnight charging at home allows electric vehicles to be used for urban daily travel, but trips that go beyond the range of a charge (100km to 300km depending on the vehicle) demand a "rest stop" while the EV is slowly "topped up" by a conventional power point.

The Solution!

A coordinated network of public chargers would allow people to travel in an EV between most destinations in Tasmania with speed and convenience. This proposal, the Electric Highway, is currently being developed by the Tasmanian branch of the Australian Electric Vehicle Association.

Other benefits

Once more public chargers are available, more people will purchase electric vehicles. A public charger network allowing EV travel throughout Tasmania would allow a new green tourism industry to develop: travel Tasmania emissions-free!

How Much Would It Cost to Build the Electric Highway?

The cost of the network will be about one million dollars. This is cheaper than a single petrol station! (Assumes councils are able to contribute their resources to provide basic civil works, such as trenching for cables and installing bollards to mount the chargers).

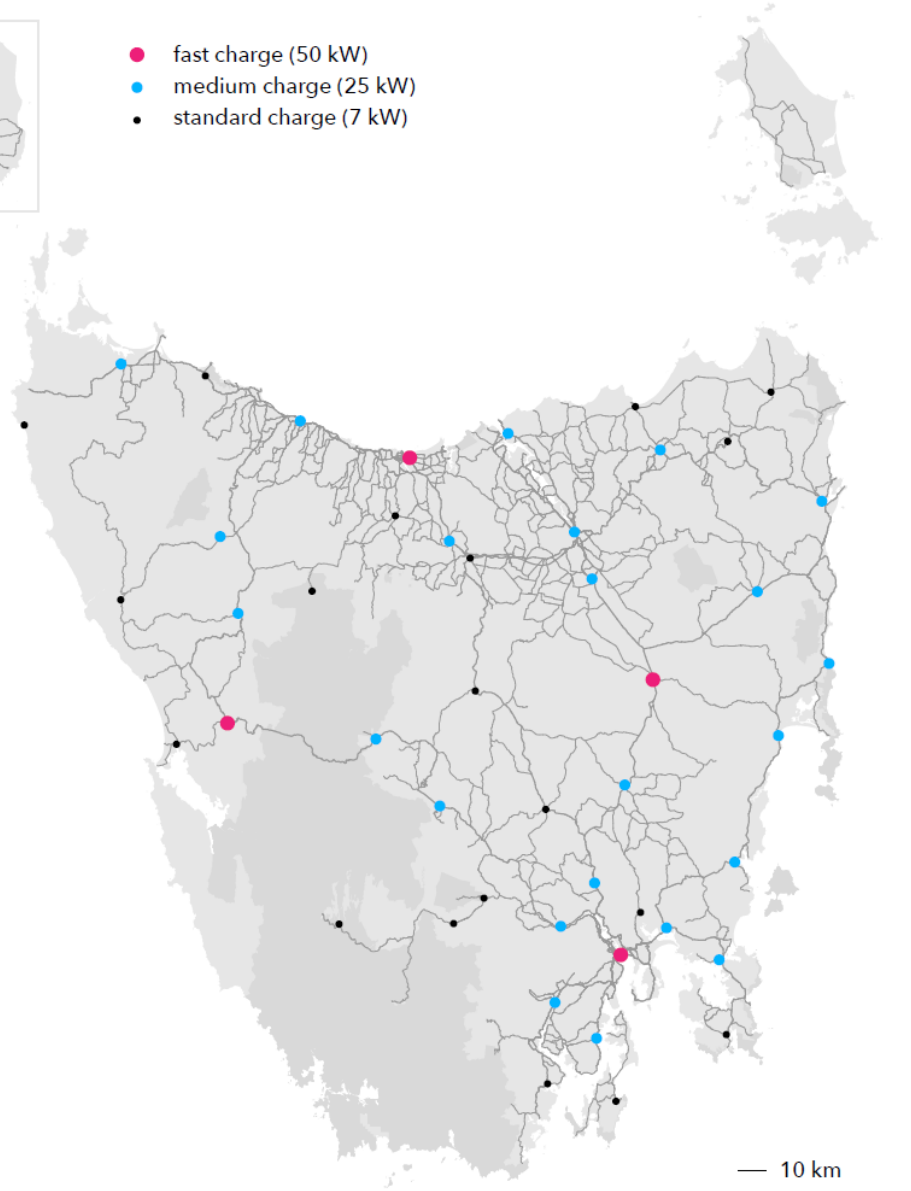
Location of Charging Points

Different types of chargers would be installed, depending on the location.

Fast chargers are many times more expensive than slower chargers. Economy demands a mixture of charging types.

Fast DC chargers (giving an 80% recharge in about 30 minutes) would be installed at stops along the major highways - eg Devonport, Campbell Town, Hobart and Queenstown. These would allow vehicles with larger batteries to travel around the state and recharge quickly.

Medium DC chargers would be located at other population centres or tourist destinations with a maximum 80 km spacing on all major routes.



Smaller capacity chargers would be located at other population centres or tourist destinations where visitors would stay for a while, such as Port Arthur or Strahan.

The types of chargers and locations are being further refined. The map shows the current proposal.

Would Charging be Free?

In the long term, free charging is not sustainable. Somebody has to pay for the electricity, and as electric vehicle usage increases, public charging stations will need to recover the electricity cost. A user pays principle is the most equitable. Ultimately we expect EV charging to be paid. It would still be cheaper than petrol.

EV commuters will still charge at home, and the Electric Highway will be used to extend range for trips further afield. EV owners would therefore be paying for the use of the electric highway infrastructure only sometimes.

Funding the Electric Highway

There are a number of organisations which will benefit from increased electric vehicle usage: electricity companies, fleet vehicle operators, electric vehicle manufacturers, the tourism industry, government and councils aiming reduce CO_2 emissions. We are proposing that the electric highway would be jointly funded by those who benefit financially from increased EV usage.

The Western Australian Experience

In 2015, the RAC (WA) funded an electric vehicle charging network in south west Western Australia. This allows fast and convenient travel in a modest car such as a Nissan Leaf from Perth to Augusta, a popular tourist route. We have been in discussions with those involved in the Western Australian charging network.

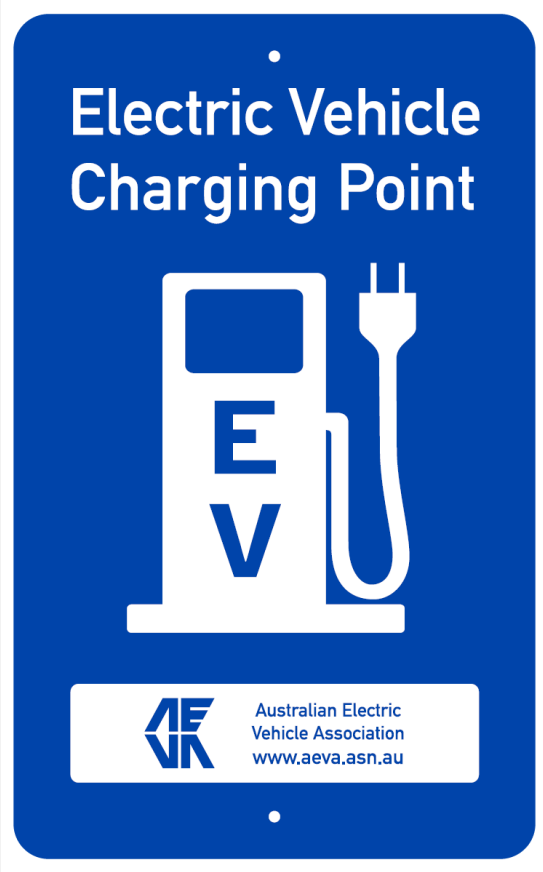
Further Information

To be kept informed of progress, sign up to receive emails from the Tasmanian branch of the Australian Electric Vehicle Association.

Looking back

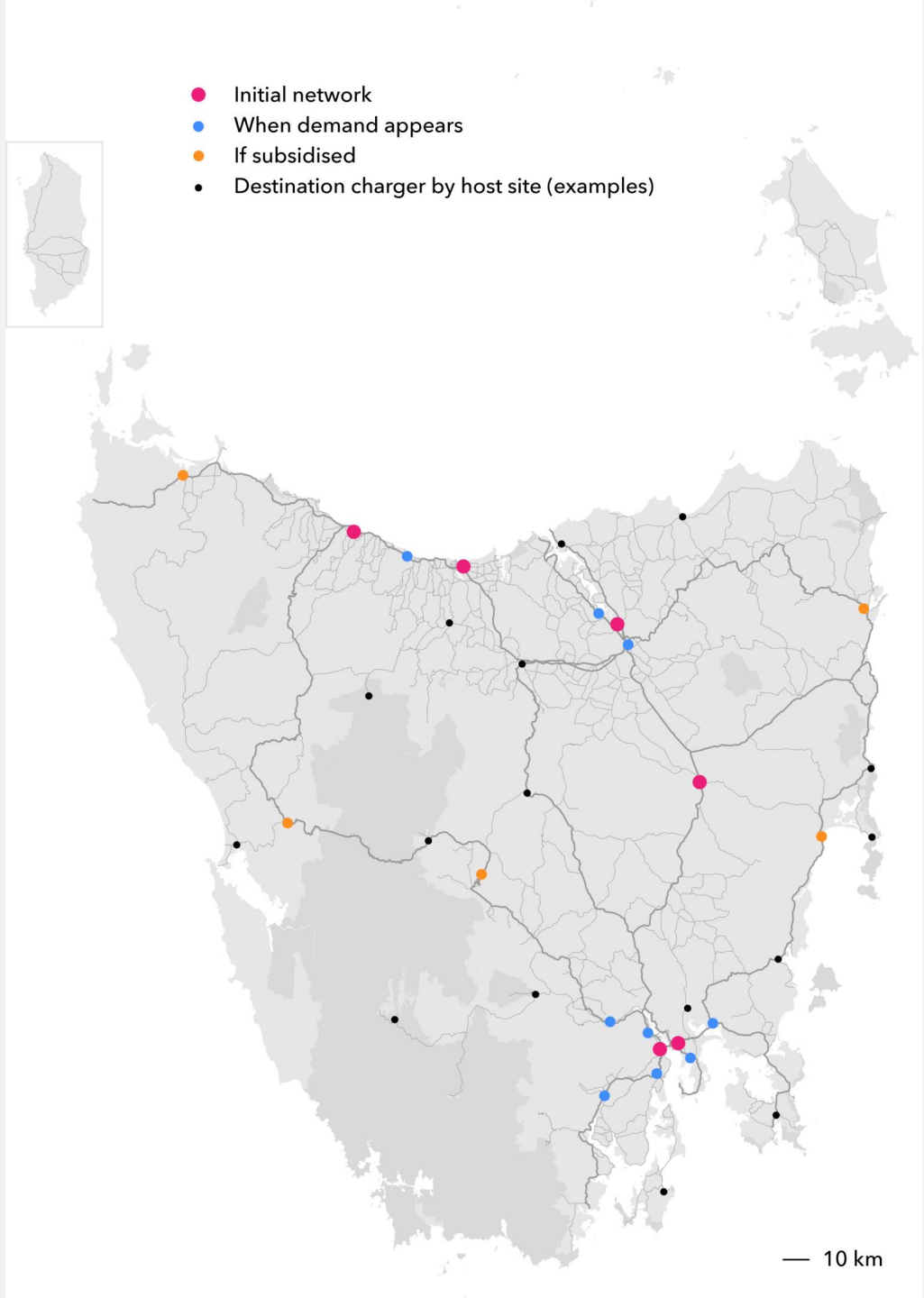
2016

- Jan – Tour European charge networks for Working Group
- Mar – Tas sites visits and evaluation with LGs
- Electric Highway Working Group developed a revised plan – 2018 target date
- Nov – Blue signs developed and distributed; AEVA brochures prepared to help promote
- AEVA members knocking on doors
- Dec – approx. 40 sites listed on Plugshare



EHT Working Group revised approach:

- 5-6 viable fast chargers along Midlands Hwy
- 5 east and west coast require subsidy
- Urban chargers develop with demand
- Destination chargers in regional areas



Looking back

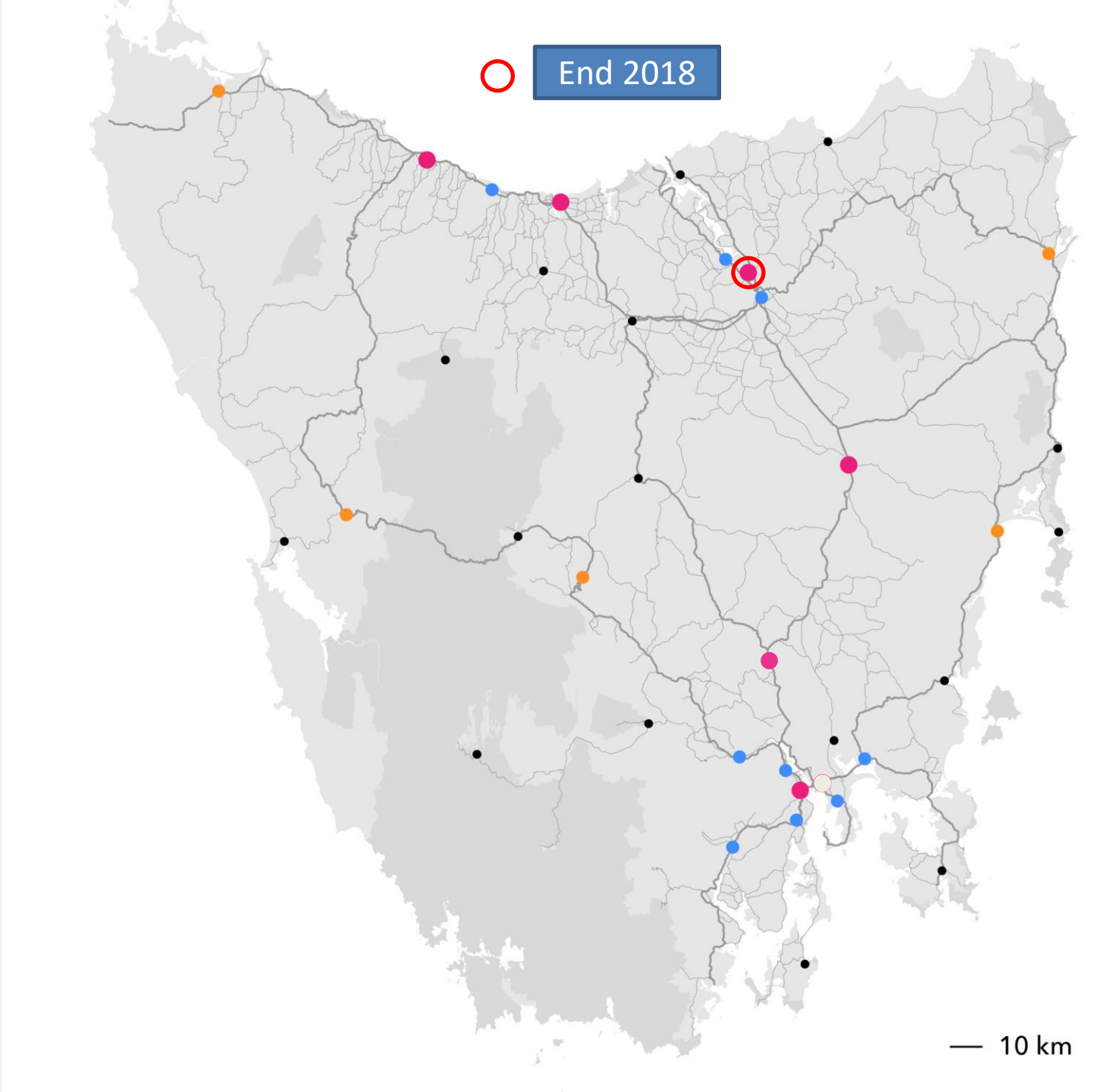
2017

- Mar – Electric Highway Tasmania P/L formed to enable Community Infrastructure Grant submission; 11 local government fast charger sites; investors raise $550,000
- Jul – Grant unsuccessful; EHT trys 5 sites: Hobart to Burnie
- Oct – TasNetworks announces Fast Charger Support Scheme
- EV Fest – AEVA push for chargers reaches about 75 sites of which approx. 5 Tesla dest. chargers

Looking back

2018

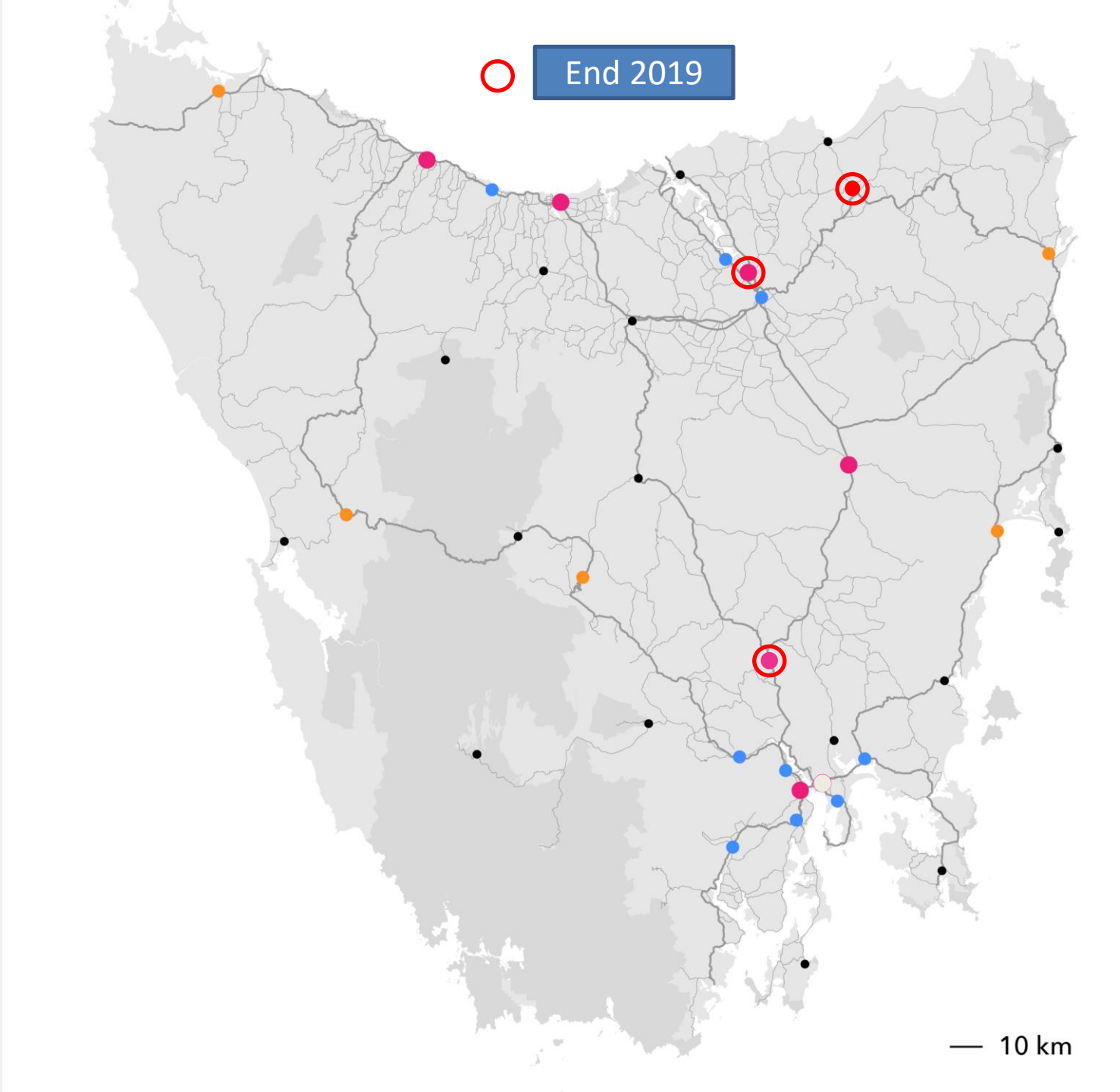
- Apr – Fast Cities (EVie Networks) announce nat. network
- Aug – Burnie requests expression of interest for fast charger
- Oct – First DC fast charger opens: Launceston City Council, Paterson Street car park
- Dec – 95 sites statewide of which about 20 Tesla chargers


End 2018
10 km

Looking back

2019

- Jan – TCCO destination charger grants: fleets, employers, etc.
- Apr – TCCO $450k fast charge grant scheme
- May – Chargefox announce national network
- Jun – Mood Food Kempton charger opens;
  TCCO grants for 12 DC fast charge sites
- Dec – Scottsdale DC charger opens;
  Plugshare ~110 sites with
  approx. 30 Tesla chargers


End 2019
10 km

2020

Fast charge roll out:

Opened:

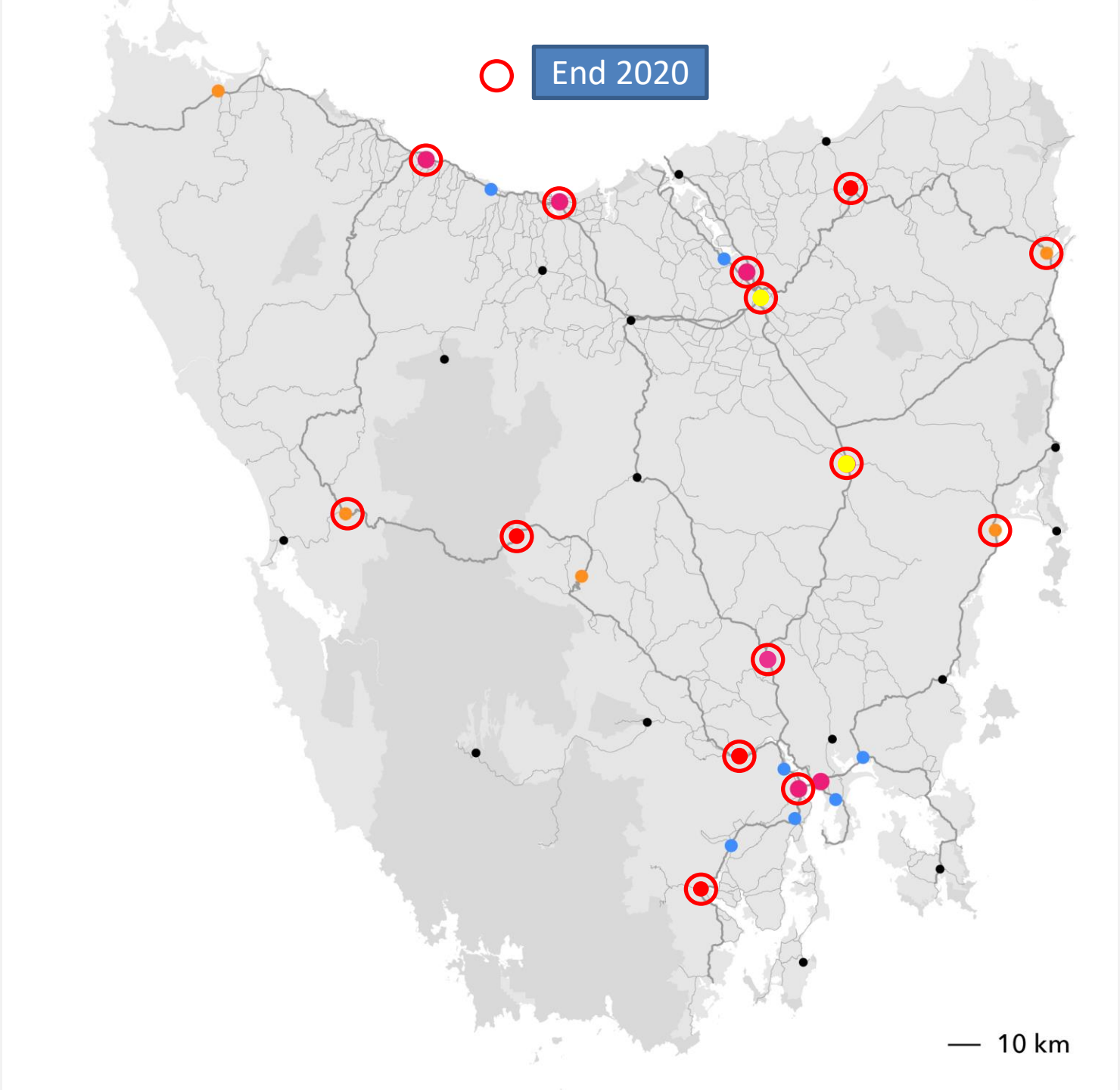
- Jan – Chargefox Kings Meadows (350kW)
- Jun – Mood Food New Norfolk

Building now:

- Geeveston, Derwent Bridge, Queenstown, Hobart
- Campbell Town (350 kW)

Coming this year:

- St Helens, Swansea, Burnie, Devonport


End 2020
10 km

Looking forward

2021+

Expected fast charge sites:

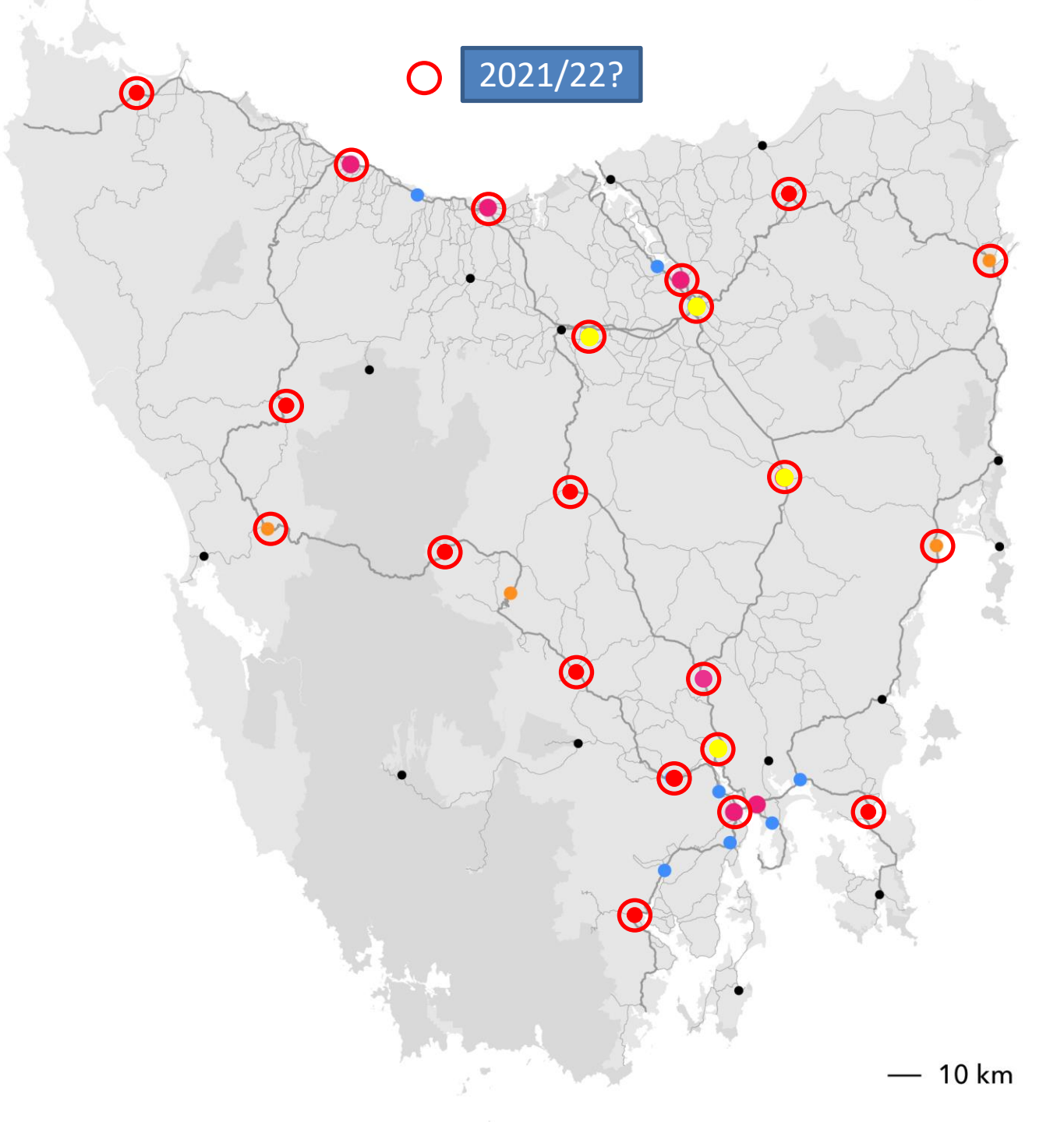
- Smithton
- Brighton, Westbury (EVie 350 kW)

Possible sites (maybe only 25 kW DC):

- Miena, Tullah, Dunalley, Ouse, Georgetown, Oatlands…?

Longer term sites:

- Hobart and Launceston suburban/periphery sites


2021/22?
10 km

Facts and figures

- Based on expected average use, it takes about 250-500 EVs to make each 50 kW charger financially viable
- At the end of 2021 there may be:
  - 8 x 350 kW DC chargers
  - 13-17 x 50 kW DC chargers
  - 2-5 x 25 kW DC chargers
- It will take about 10,000-20,000 EVs on the road in Tasmania to make all these chargers viable
- This might happen around 2027

Looking forward – Fast chargers

- Plug and play from 2021 for enabled cars, chargers (Tesla superchargers always have been!)

My predictions:

- Race to meet demand from about 2024 (selected sites)
- Up to eight chargers at existing sites rather than more sites
- 100-150 kW to be ‘common’; higher power less so
- But higher power if 800V EV architecture adopted
- CHAdeMo cars become rare; mostly CCS2 plugs added
- Wireless at taxi ranks

Looking forward – Destination chargers

- Big push on tourist accommodation, attractions in late 2020
- Expect charging at accommodation ‘normal’ by 2023/24, then EV rentals will be rolled out
- Decreasing emphasis on ‘public’ AC chargers except in suburbs without private off-street parking
- Free public charging will become uncommon
- Lower power DC (15-25 kW) will become more common
- V2X chargers – some limited scope in public

Public charging in a mature system

- There will *never* be as many public fast charge stations as there are petrol stations
- Total public charging, perhaps 5%-10% of EV energy needs
  - Destination charging, low/intermediate power, (2%-5%)
  - Public fast charging (2%-5%)
- Exception: taxis and some other fleet vehicles
- >500 EVs/fast charger bay
- Public prefer fast chargers near 24 hour fast food

Questions?