Market update: Lion firms up its Green Hydrogen strategy

November 2021

LION H2energy

Lion moving closer to first hydrogen refuelling station

1. State governments are driving zero-emission transition through regulatory measures and pledges
2. Lion is focusing on helping the heavy mobility sector (buses then trucks) comply with ambitious targets
3. Hydrogen refuelling infrastructure is a key component of the transition, but is currently lagging
4. Lion, together with its partners, envisions building and operating a network of hydrogen production hubs and refuelling stations
5. Lion is working closely with equipment suppliers, bus manufacturers and fleet operators with a view to open its first refuelling station

Lion has established hydrogen value chain partnerships

Censtar

WAGNER CORPORATION

BLK AUTO

GPA ENGINEERING

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Hydrogen city bus manufacturers – overseas/local

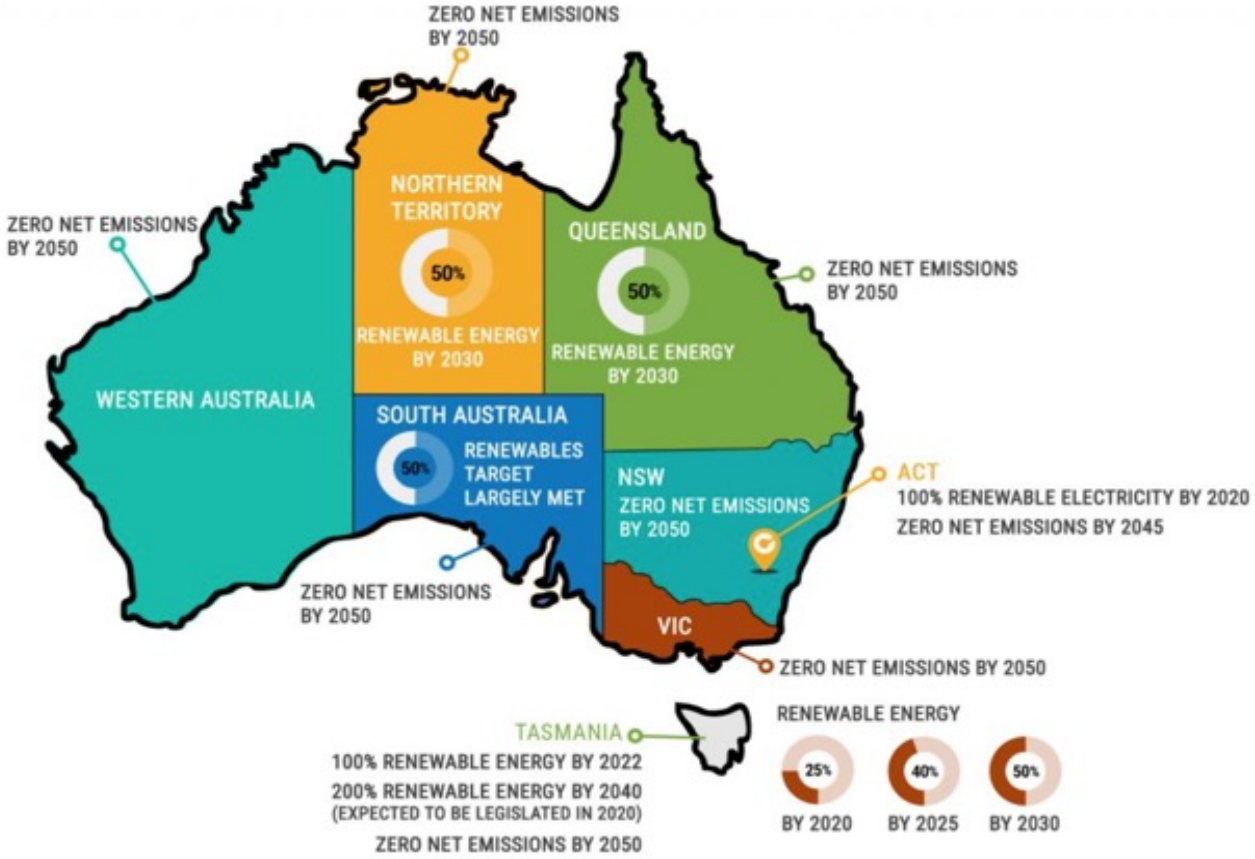
Bus fleet operators in Qld, NSW and Vic

States governments are leading the zero-emission charge

"*The Morrison Government will act in a practical, responsible way to deliver net zero emissions by 2050 while preserving Australian jobs and generating new opportunities for industries and regional Australia*." Oct 26, 2021

On a combined basis, all states have net zero emission targets by 2050

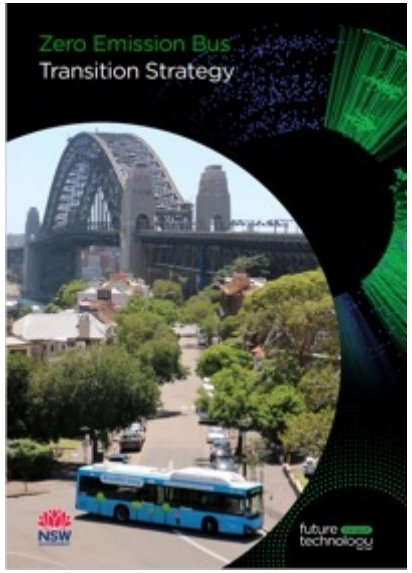
Green hydrogen considered key element of zero emission goals



Source: 100percentrenewables.com, https://www.minister.industry.gov.au/ministers/taylor/media-releases/australias-plan-reach-our-net-zero-target-2050

The public bus sector is under transition to zero-emission pressure

- While buses account for a small proportion of $C0_2$ emission, governments have more direct influence on this sector as bus procurement is effectively funded through bus service contracts.
- Transport for NSW (TfNSW) seeks a total replacement of the public bus fleet by zero-emissions buses (ZEB) by 2030.
- Queensland Government committed that every new urban bus added to the fleet in South-East Queensland will be zero-emissions by 2025, followed by state-wide mandate by 2030.
- Victorian Government has pledged that all new bus purchases will be zero emission buses from 2025.
- The aggressive cut-off date for ZEB is driving bus fleet operators to quickly embrace battery and hydrogen technologies.



Hydrogen buses are a proven technology and are coming to Australia

- Hydrogen buses are already in operation in many countries, with Europe and China leading the growth.
- Multiple hydrogen bus vendors ensure growing competition:
  - Europe - Van Hool, Wrightbus, Solaris, Caetano, Rampini, Safra, & Daimler.
  - Asia - Toyota, Hyundai, Weichai, Foton, Yutong & Higer…
  - US - Cummins, New Flyer, Hyzon…
- In China alone, more than 10 hydrogen bus manufacturers. Competition is driving prices down quickly.
- Australia's bus operators have started to review hydrogen solutions, in addition to battery electric buses (BEV).
- In October 2021, BLK/Hyzon unveiled Australia's first hydrogen powered coach, a significant milestone in the nation's adoption of zero-emission vehicles.
- The back-to-base model of buses is highly suitable for long-term offtake arrangements between fleet operators and hydrogen producers/distributors.

Australia's first hydrogen coach, from specialist vehicle importer and distributor BLK Auto, in partnership with Hyzon Motors.

Left-hand drive version of the city bus Foton Mobility intends to import and then make in Australia.

Australia slated to follow Europe/China adopting hydrogen buses

Hydrogen buses fleets in Europe

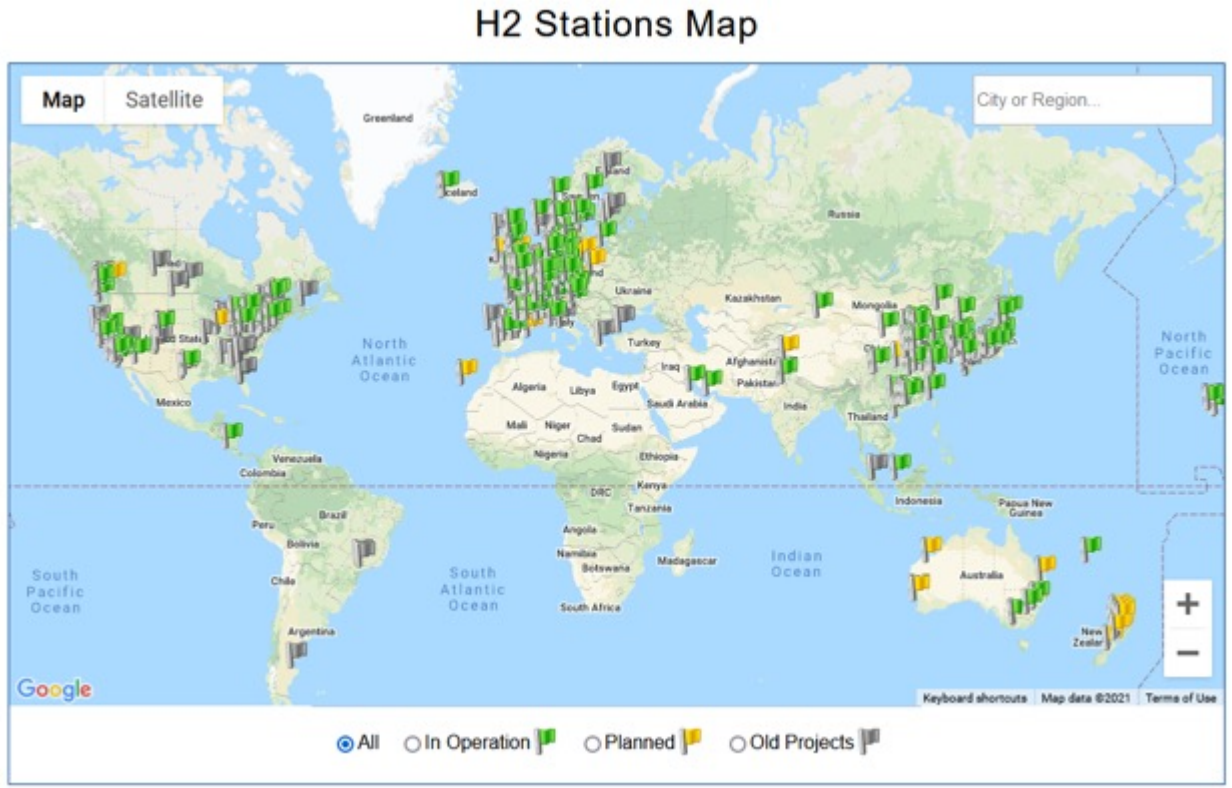
Source: Waterstofnet, Hydrogen Europe

Van Hool hydrogen bus in Pau, France

Source: Van Hool

Hydrogen refuelling stations worldwide – Australia significantly lagging

- Europe and China are developing infrastructure at a rapid pace
- China's first hydrogen station opened in 2017. There are now in excess of 115 stations and more than 1,000 are planned by 2025
- Australia's rollout is formative. Currently, there are only two hydrogen refuellers open to specialist fleets (Melbourne and Canberra). Hyundai also has a hydrogen refuelling point behind its Sydney headquarters (however not open to the public).
- Unless addressed, the lack of hydrogen refueling infrastructure will constrain the adoption of hydrogen as a fuel replacement.



Source: H2stations.org by LBST

Hydrogen compares favourable against battery vehicles for Australian bus operators

- Hydrogen buses refuelling time (5-10min) is significantly less than BEV recharging time (up to 6-8hrs). BEV fleets require extra buses to compensate for the charging time.
- BEVs typically charge at night, when electricity price is high and renewable electricity is significantly less available.
- BEVs require significant additional infrastructure (e.g. 1 charging point for 1-2 buses) and access to large electrical capacity.

Example of BEV charging infrastructure in Krayot, Israel

- Australian bus depots are usually located in areas with limited space and low power capacity, making them unable to easily accommodate infrastructure required for BEVs fleet
- With hydrogen, operators can replace diesel buses with minimal changes to existing depots and route schedules:
  - Diesel like refuelling times mean operators can replace diesel buses with hydrogen buses with no change to routes and schedules
  - On depot hydrogen dispensing equipment occupy smaller footprint and require lower power requirement

Bus depots constraints favour hydrogen adoptions as a zero-emission technology

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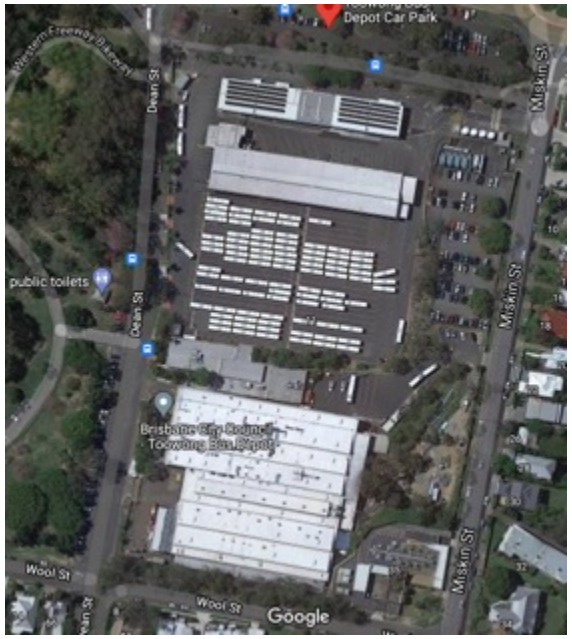
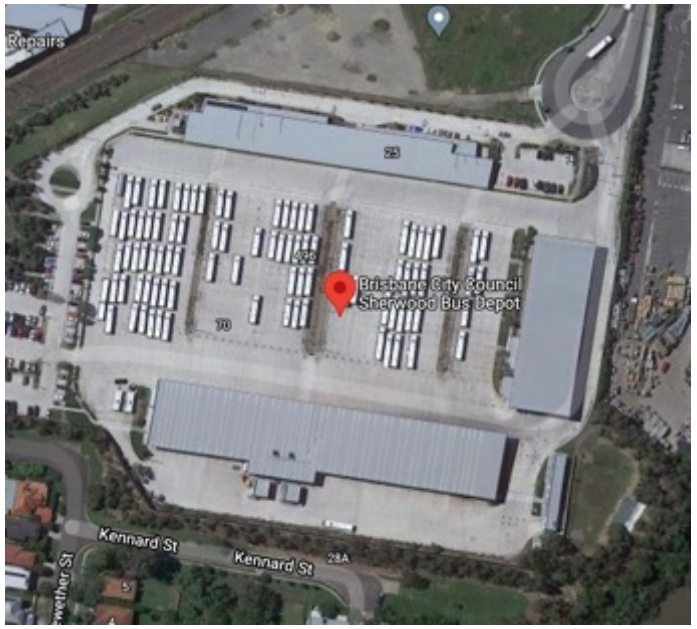


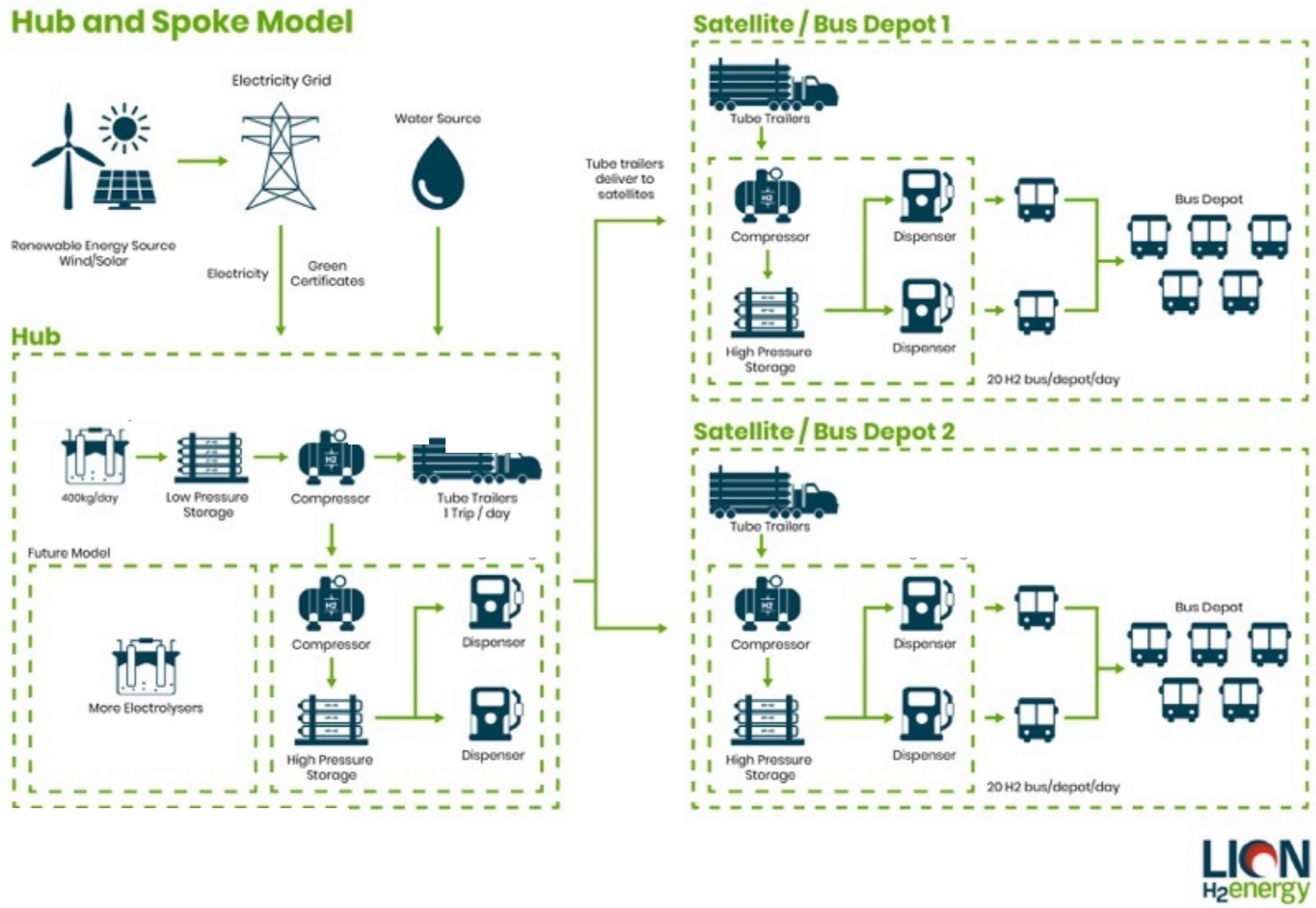
Sherwood



Carina

- Currently bus depots have no existing BEV recharging points. In most cases, electricity capacity a problem.
- Depots and schedules are built and designed around onsite high-speed diesel refuelling.
- Onsite Hydrogen refuelling infrastructure can closely resemble the existing diesel refuelling kit.
- Hydrogen refuelling equipment can fit into a small footprint.

Depot space and power constraints driving the Lion hub and spoke model



Hubs located in areas with land and power available

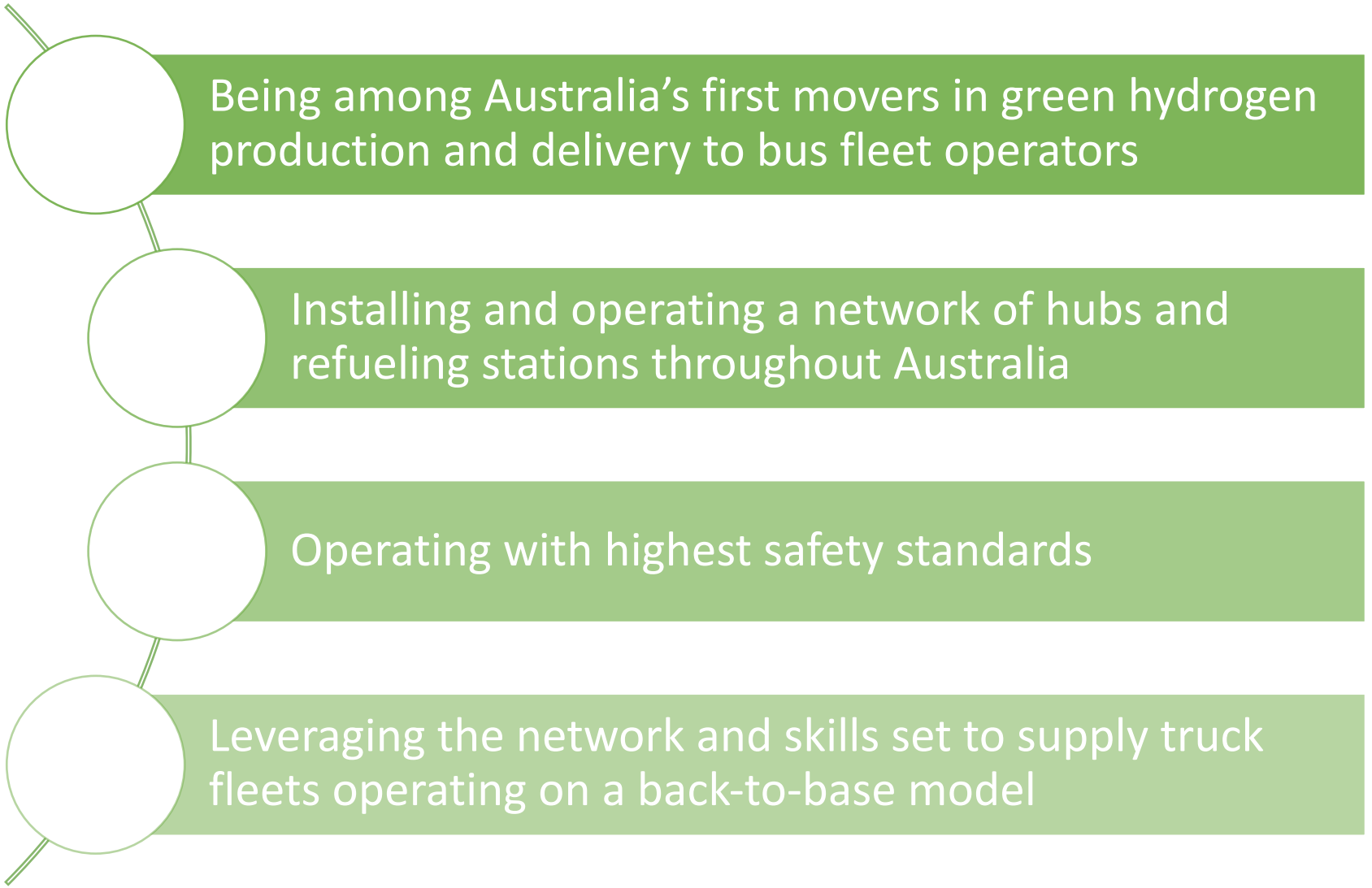
Lion's concept design of a hydrogen production hub with collocated refueling facilities

Modular refuelling spoke infrastructure

- Small modular footprint on depot and minimizes depot capex
- Fast installation, minimizing depot disruption for bus operators
- Capable of 500kg per day, fast refueling speeds
- Hydrogen is delivered from Hub on tubular trailers
- Spokes can be added with ease

Source: Fueltech Hydrogen Pty Ltd, Censtar's local partner

Lion’s green hydrogen vision



Thank you

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