



**LION**  
H<sub>2</sub>energy

***To become a leading independent producer and distributor of green hydrogen in Australia for the domestic mobility market***

Lion Energy Limited (“Lion”) is an ASX-listed energy company transitioning to be a first mover in green hydrogen in Australia

Lion currently generates revenue in oil and gas, but is rapidly building hydrogen capability

Lion has established a best-in-class hydrogen team with 80 years of collective development experience

Lion aims to produce and dispense green hydrogen for the heavy mobility sector by end-2023 and to operate in 20 locations by 2026

- 1 **Attractive market potential**
- 2 **Early mover with project under execution**
- 3 **Focused and realistic strategy**
- 4 **Strong alignment with government policy and community needs**
- 5 **Experienced project team**
- 6 **Strong corporate governance**

### Positioning

- Solution provider for Australia's zero-emission targets commencing 2025
- Production, storage and dispensing of green hydrogen
- Focused/realistic strategy – taking power from the grid initially

### Markets

- Back-to-base heavy mobility (buses then trucks)
- Later, other transports (train, ships, planes) and light vehicles
- Complement the battery electric vehicles rollout

### Model

- Small production hubs, each servicing a few dispensing stations
- Demand-driven, proximity to customers
- Proven, low-cost technology



# Project management team



**Tom Soulsby**  
Executive Chairman

30years



Accounting



Oil & Gas



Investments



Leadership



**Damien Servant**  
Executive Director

20years



Finance



Oil & Gas



Commodities



M&A



**Alistair Wardrope**  
Technical Director

16years



Mech Eng



Renewables



Biomethane



Hydrogen



**Andrew Lelliot**  
Project Director

15years



Mech Eng



Gas Industry



Procurement



Hydrogen



**Mitch Blythe**  
Project Manager

20years



Mech Eng



Oil & Gas



Commercial



Hydrogen



**Dr Andrew Dicks**  
Board Advisor

30+years



Chemistry



Fuel Cell

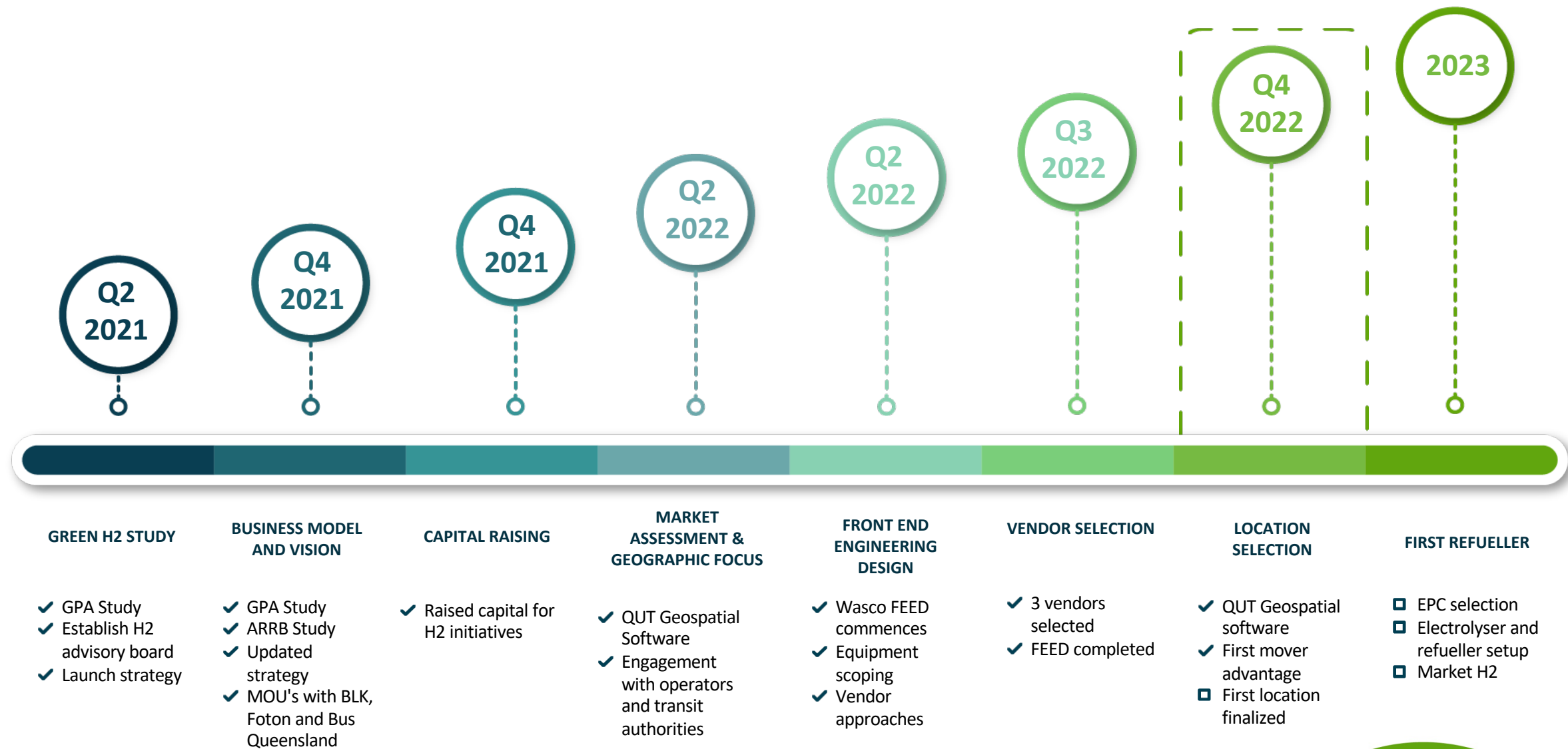


PhD



Hydrogen

# Progress to date



# Green hydrogen value chain (mobility sector)





First  
production by  
YE2023

20 dispensing  
locations by  
YE2026

A\$12m capex  
per 500kg/day  
units

Hydrogen  
price at parity  
with diesel

## Roadmap (simpler option 1)

- Establish replicable commercial business model
- Build, market and execute first location
- Start hydrogen production
- Finalize detailed rollout and funding plan for Phase 2

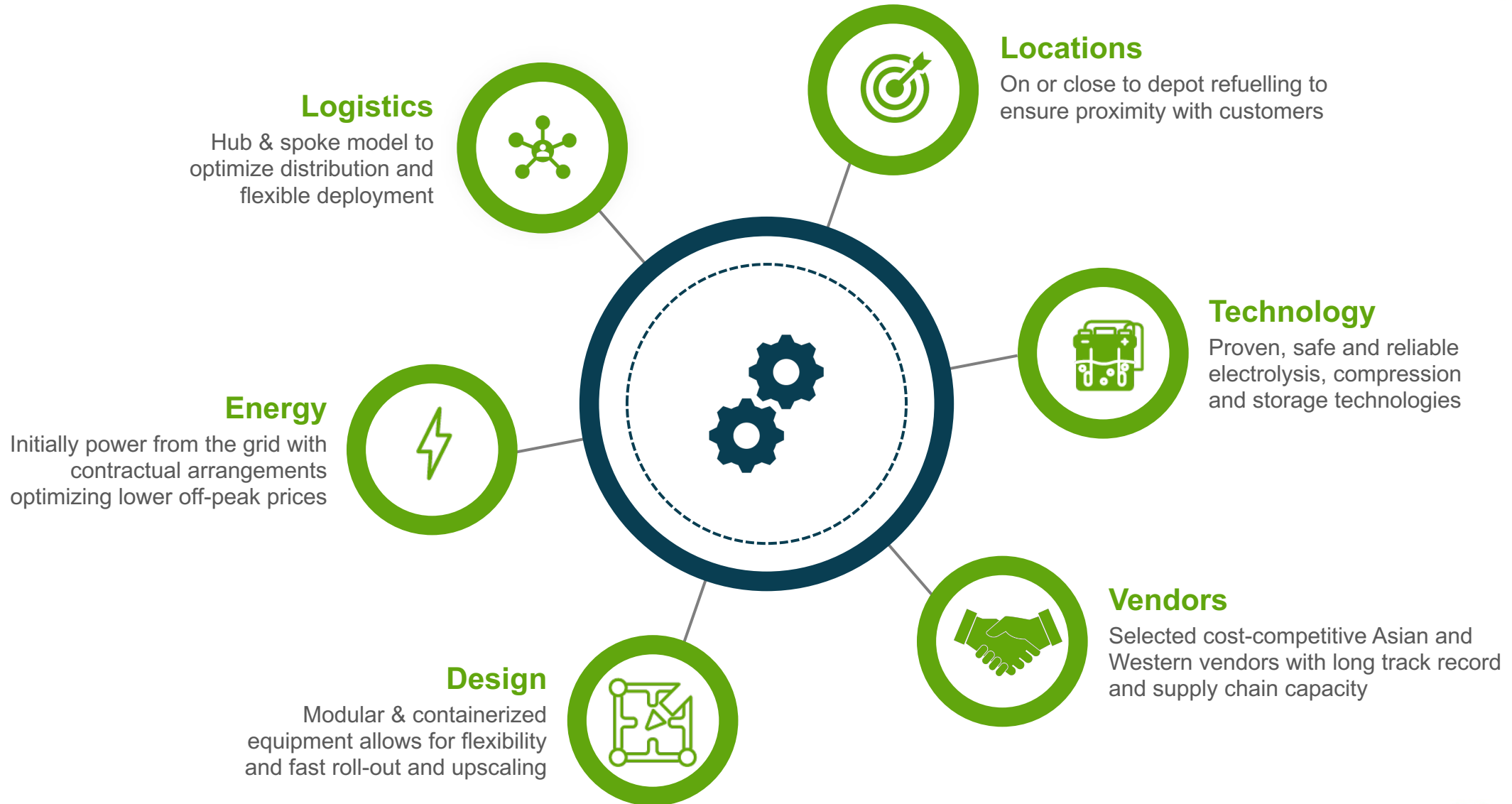
PHASE 1 (“Initiate”)  
2022-2023

- Execute off-take contracts with broader customer group
- Signing EPC contract for 20 stations
- Set-up inhouse O&M team
- Build, market, execute
- Finalize detailed rollout and funding plan for Phase 3

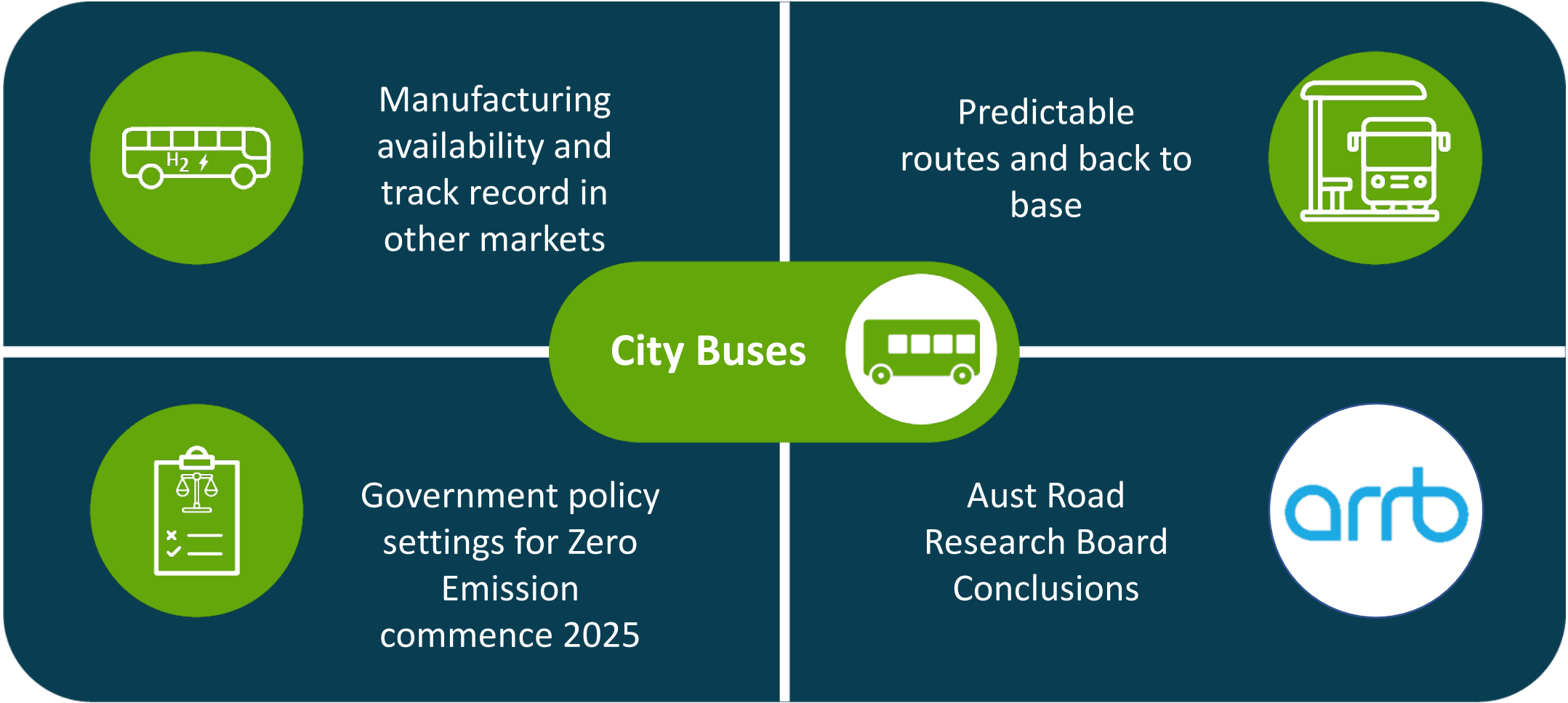
PHASE 2 (“Replicate”)  
2023-2025

- Replicate for an additional 30 locations
- Begin “merchant” roll-out (i.e. non-back-to-base) to other transport sectors
- Enlarge hub, consider renewables
- Optimize hydrogen production storage and infrastructure

PHASE 3 (“Expand”)  
2026 onwards

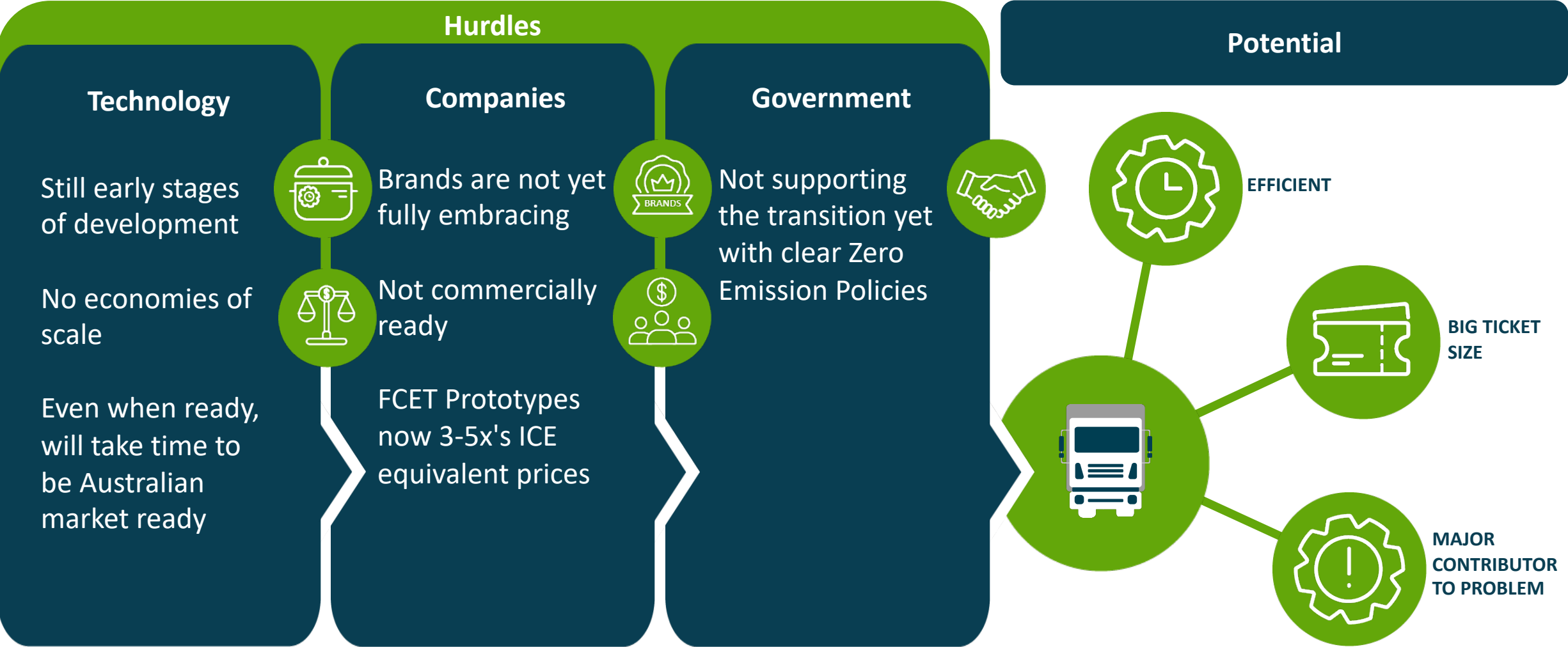


Target market : Hydrogen buses – the early adopters



Commissioned by Lion Energy in 2022

# Target market: Hydrogen trucks – larger prize but later adoption



# Leading zero-emission charge led by State Governments



## Regulatory-driven demand



### Hydrogen refueling stations

We estimate at least 50 x 500kg/day refuelling stations required by 2030 to meet ZEB demand

## Low hanging fruit



### Bus Segment

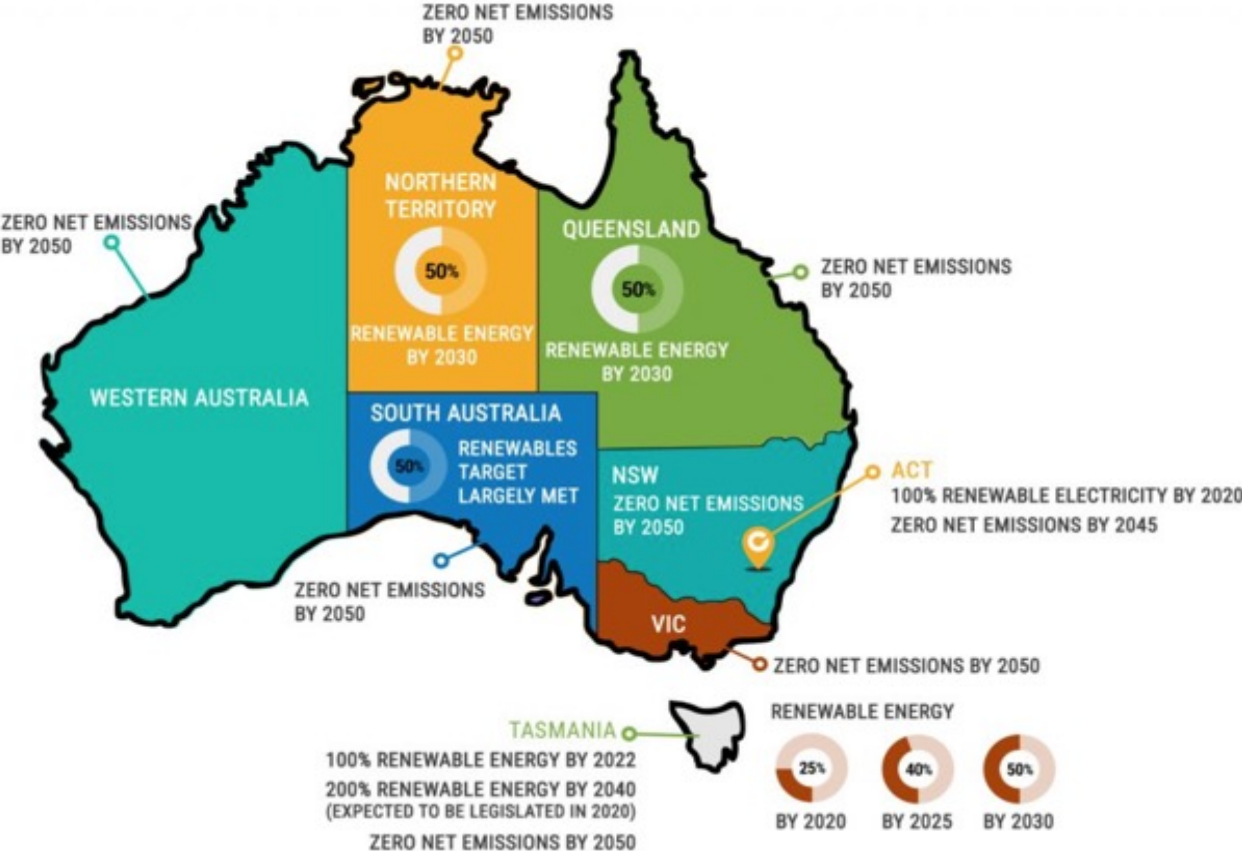
Regulatory impetus  
Vehicle availability

## Best fit for technology



### Truck segment

Lacks regulatory impetus now  
Phase 2 focus and bigger market

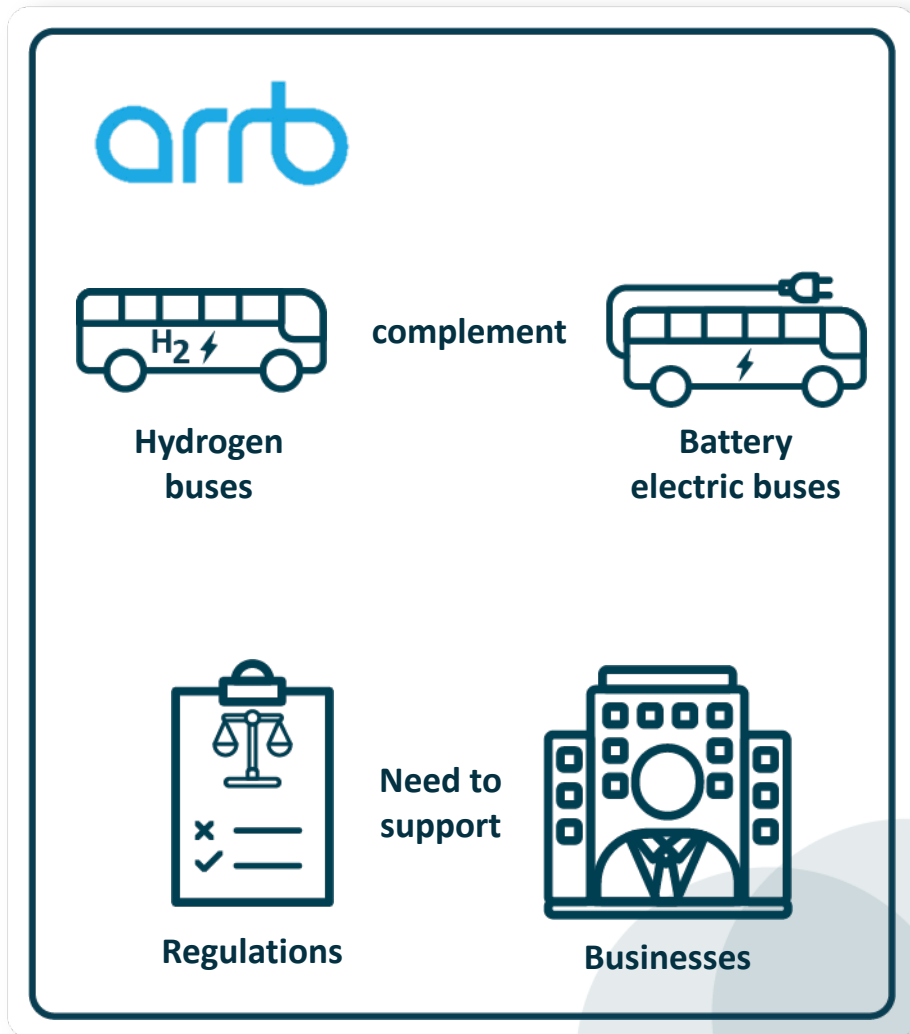




## Regulatory momentum

- Transport for NSW (TfNSW) plans to see its 4,100 Sydney buses fully transitioned by 2035
- 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
- The Eastern Seaboard has regulatory settings conducive to the take up of ZEB.





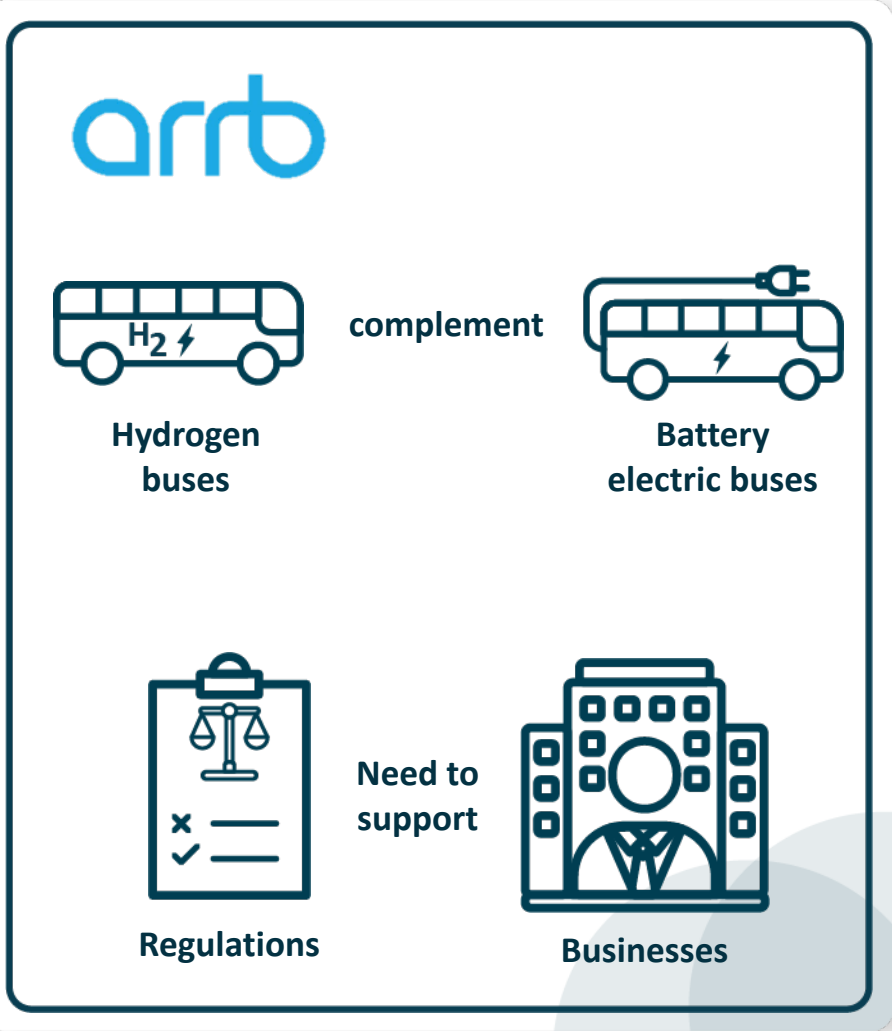
## Issues for Battery Electric Buses

- limited depot space for charging infrastructure
- High infrastructure investments (chargers, energy storage and electricity connection/substation upgrades),
- Short range and long charging times of BEBs likely requiring additional BEBs to maintain service levels
- Disruption to operations by rollout of infrastructure

## Clear role for FCEB

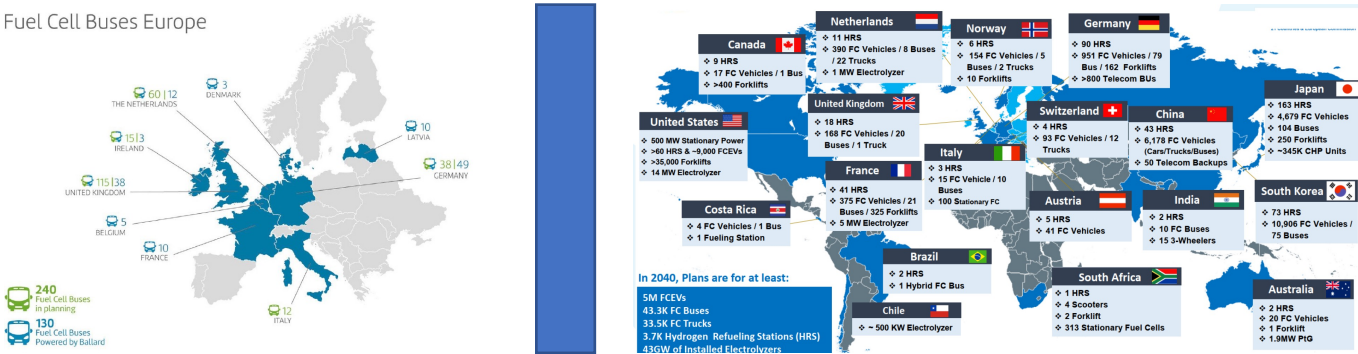
- Small footprint of H2 refuelling infrastructure and limited disruption to services
- Fast refuelling,
- No range restrictions comparable to current bus fleet
- **FCEB** (vehicle and gas) purchase prices will further reduce as the technology matures and production volumes increase

ARRB study confirms role of H2 buses for Australia’s roll-out of zero-emission buses

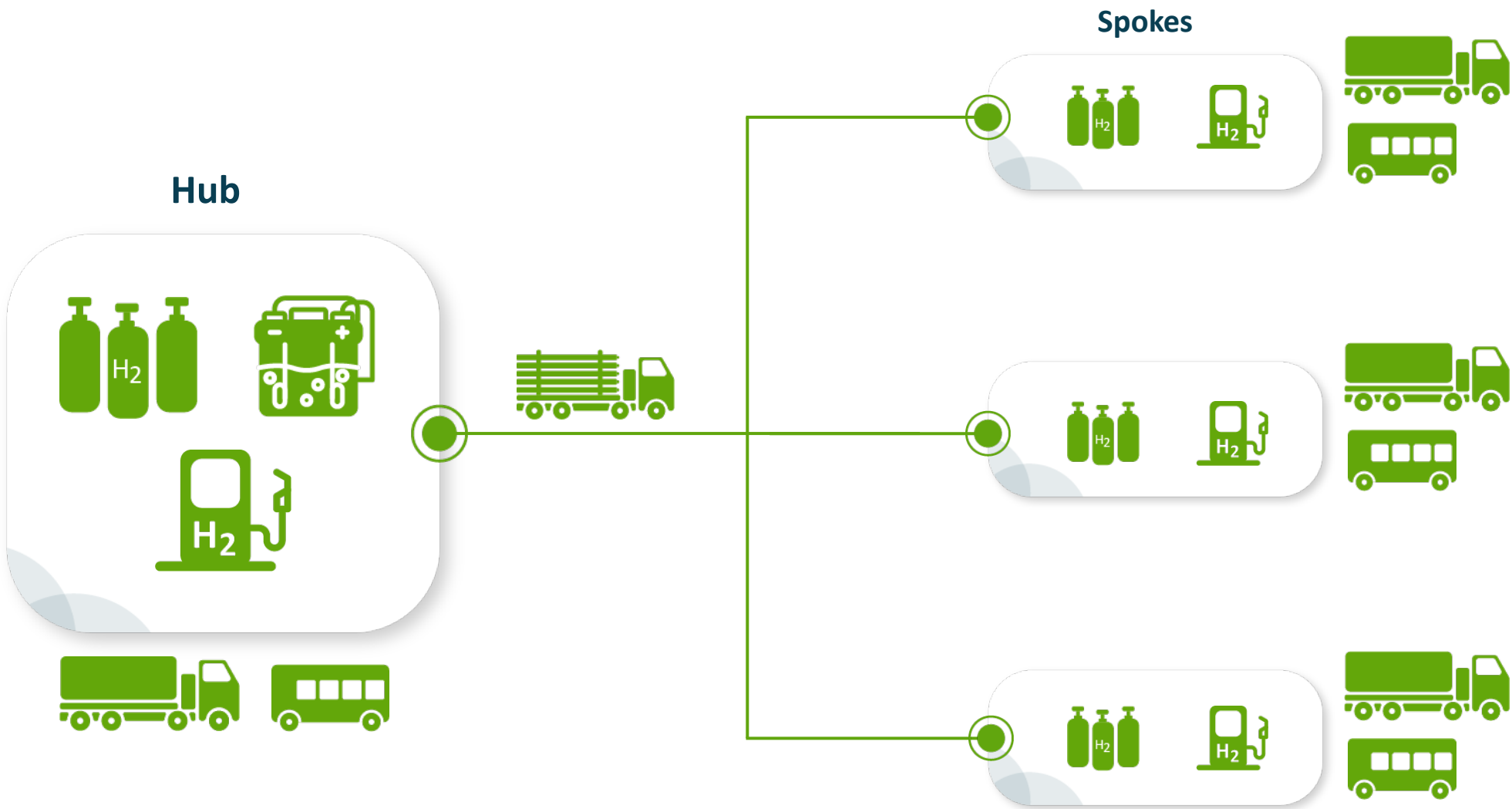


	Qld	NSW	Vic
Registered buses	21,196	26,548	20,849
Public buses subject to upcoming <u>ZEB</u> regulations	Approx. 4,500	Approx. 8,000	Approx. 4,000
ZEBs in 2030 @ 20% ZEB gov. target @ natural bus replacement cycle @ NSW gov. target	900 1,600	1,600 2,800 8,000	800 1,400
FCEBs in 2030 @ 20% market share	180	560	160

900 FCEBs  
(natural replacement cycle)

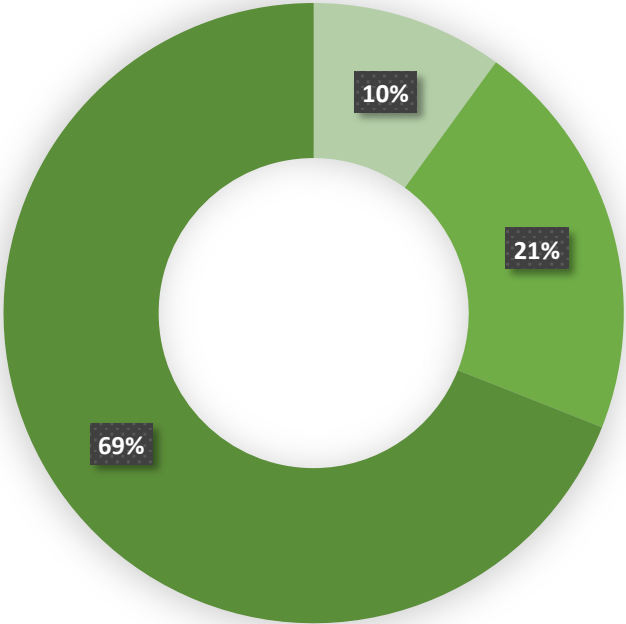


# Hub and Spoke Model



# First production and refuelling station : FEED completed

Total cost for integrated hub & spoke  
~ AUD 12 Mn



■ Project Management   ■ Construction   ■ Equipment



**Hazop & Risk**



**Facility Location & Sizing**

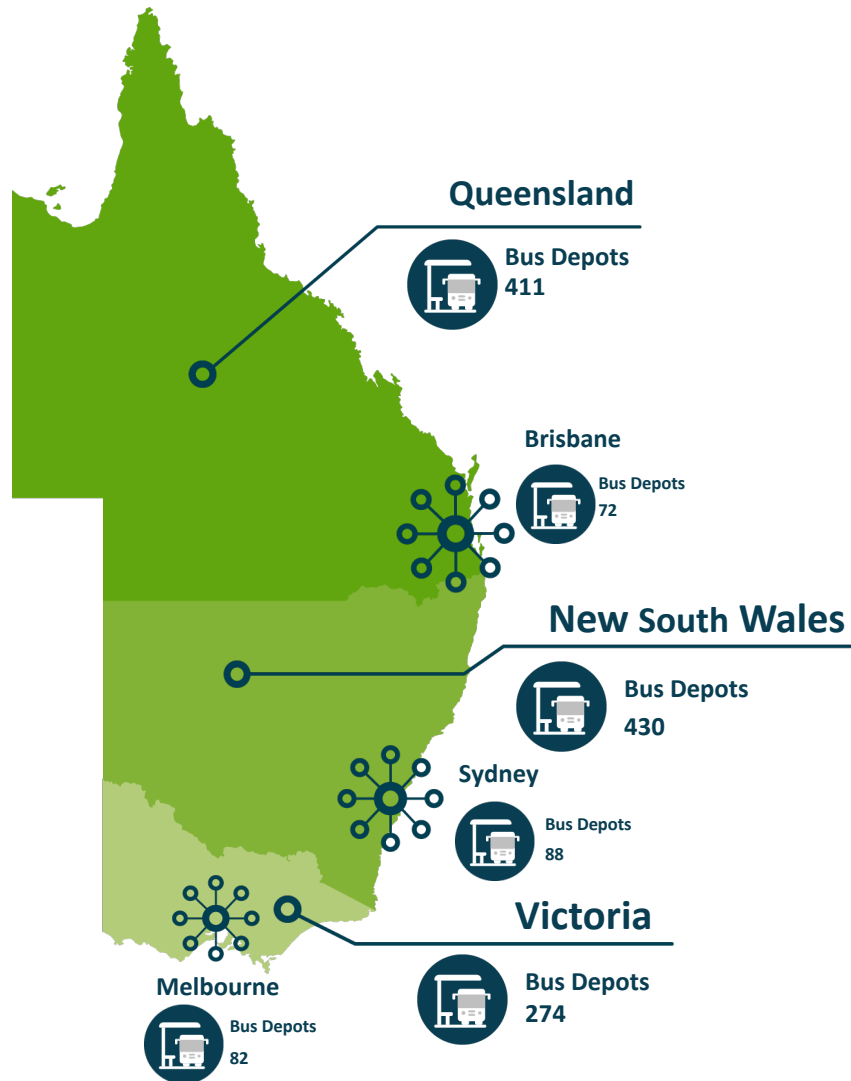


**Operation and personnel**



**Layout & equipment spacing**

## Fast replication to multiple locations



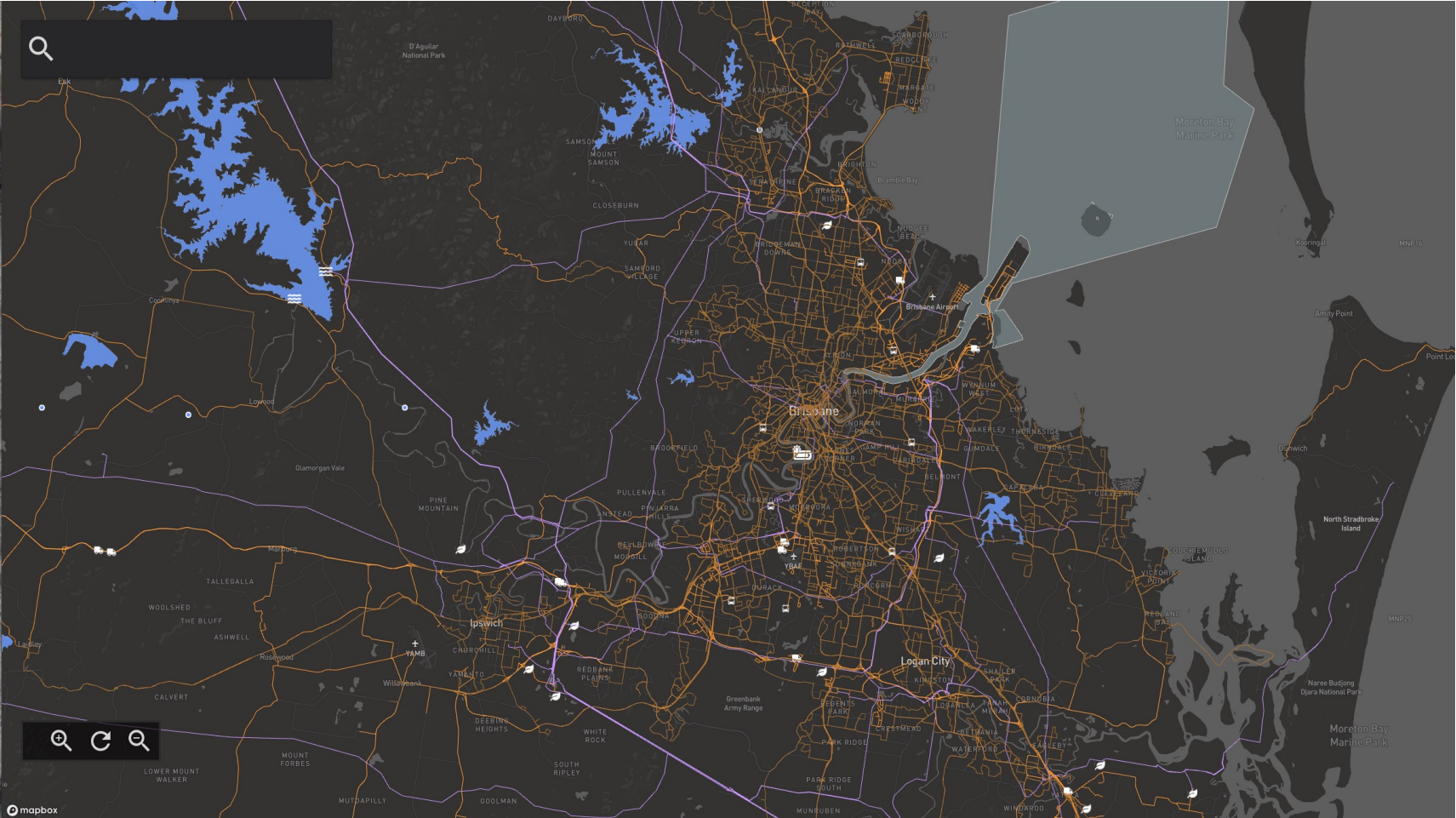
Aim to operate a series of production hubs and up to 50 refuelling stations in Australia, with a focus on the untapped East Coast market.

There are currently no hydrogen refuelling stations for bus operations in Australia

Top 20 operators operate 300 depots with an average of 60 buses per depot



# Location optimization tool



**Water**



**Electricity**



**Renewables**



**Ports**



**Heavy Vehicle  
Routes**



**Bus Depot &  
Routes**

