BusTech Group

INTRODUCTION TO BUSTECH ZERO EMISSIONS VEHICLES

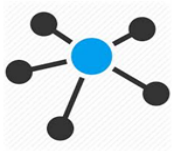
SEPTEMBER 2021

Our Mission

BusTech Group is an Australian founded and owned bus manufacturing group designed for a connected world - delivering integrated, low-emission mass mobility solutions enabled by technology.

Energy Independence

Energy agnostic solutions that deliver greater efficiency, increased operational longevity and a lower total cost of ownership



Architectural Flexibility

Scalable design and manufacturing solutions that ensure our vehicles are calibrated to the specific operational needs of our customers

Vehicle Connectivity

Integrated digital solutions that enable our vehicles to fully connect to their ecosystem for enhanced operational performance

Sustainability By Design

New mobility solutions that deliver positive environmental and economic impacts which accelerate the drive to ZE from 2025

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Our Technology Focus Across Mobility

BusTech Group understands what's important in mobility

Maturing Powertrain Technologies	**Battery and Fuel Cell Electric Vehicles** are maturing powertrain technology, Transport systems look to transfer to zero emission transport solutions.
Lightweight Materials	**Stronger and Lighter Materials** are reducing vehicle weight without sacrificing passenger safety.
Intelligent connected Vehicles & Network	New ZEB vehicles are being configured with **Vehicle-to-Infrastructure (V2I), Vehicle-to-Vehicle (V2V), and communications technologies,** so every vehicle can know precisely where every other vehicle is on the road within an operating network.
Mobility Preferences	Younger generations are leading the way toward **Pay-Per-Use Mobility** in place of owning a car; nearly 50% of Gen Y consumers like using a smartphone app for transport and already plan travel so they can multitask.
Emergence of Assisted / Automated /Autonomous Tech Vehicles	**Autonomous-Drive Technology** is no longer a case of science fiction; the question is **when and how** will it become more **mainstream and widely adopted?**

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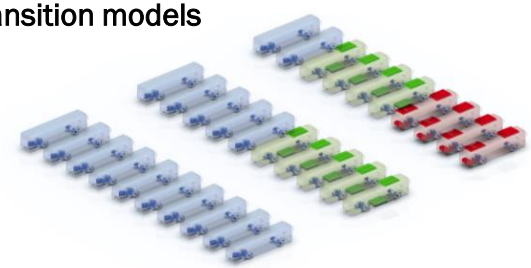
Product Design – Flexible Architecture

BusTech Group designs buses for the future

Diesel

Battery Electric

Supports fleet transition models



Hydrogen Fuel Cell

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User Centric Product Design

Updated interior design to provide an environment, clean environment

Design Language support Zero Emission Product
Developing a contemporary form of the vehicle both exterior and interior

User Centric Product design
Focus on the Driver, the patron and the experience establishing a viable alternative for mass transport.

Technology Rich Environment
Developing the smart bus platform covering all aspects of Product, Patron and Infrastructure network, integrating simultaneously real-time to offer the ultimate in service

- Designed to be distinctive and to allow patrons to identify product
- Zero Emission vehicle with compliant design for both to both Disability Act & Australian ADR’s
- Integrated passenger information and infotainment capability
- Interior optimised for different seating configurations

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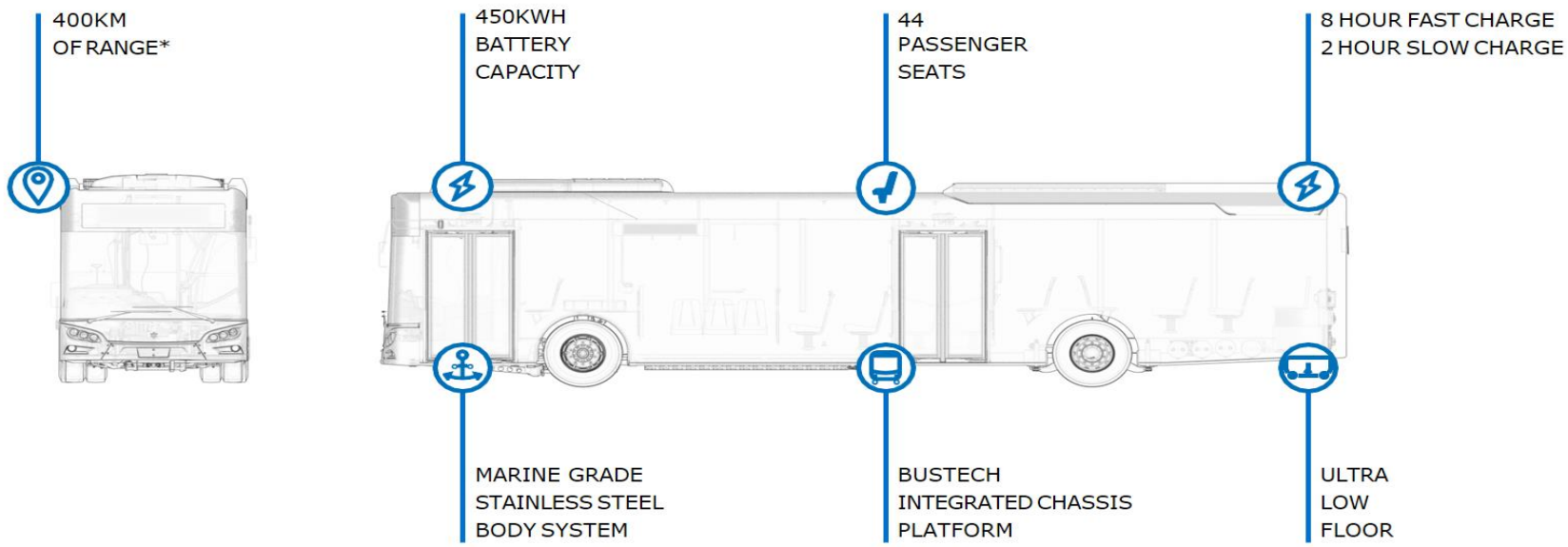
BusTech Integrated Electric Bus

Market leading useable energy, safety and warranty

- Highest energy density of any battery in Australia
- Highest useable energy and longer range
- Highest safety standards
- Up to 12 years warranty
- Most useable energy at end of warranty period
- Advanced battery management system, able to integrate with any charger



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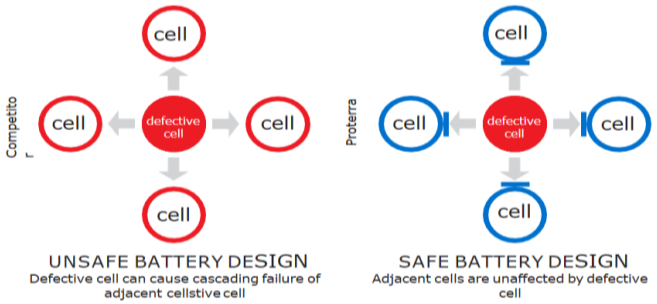
BusTech Integrated Electric Bus

Best practice safety standards

Proterra® batteries feature state-of-the-art safety components, including cell-level passive propagation and resistance, compliant to UNECE R100 standard.

Robust design and rigorous testing reduce risk of thermal event

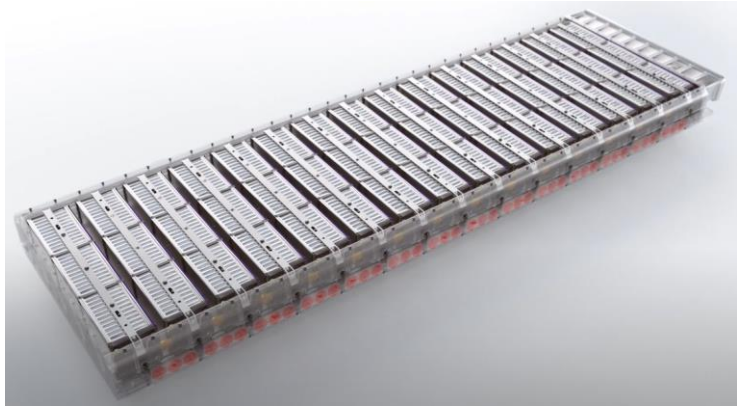
- Pack architecture allows for proper venting, away from occupant cabin and doorways
- Passive safety elements enable the release of energy over a longer period of time instead of all at once
- Active safety elements extend time for occupant clearance and emergency response intervention



UNSAFE BATTERY DESIGN
Defective cell can cause cascading failure of adjacent cellstive cell

SAFE BATTERY DESIGN
Adjacent cells are unaffected by defective cell

TESTS COMPLETED	REFERENCE
Mechanical Shock - Crash	ECE R80
Impact/Underside Abuse	Proterra Internal
Drop	SAE J2464 Sec 4.3.2
Battery Enclosure Integrity - Crush	SAE J2929 Sec 4.6 UL 2580 Sec 38 ECE R100 Annex 8D
Passive Propagation Resistance	SAE J2464 Sec 4.4.5 UL 2580 Sec 43
Forced Thermal Runaway	Proterra Internal
Simulated Vehicle Fire	SAE J2929 Sec 4.7 ECE R100 Annex 8E
Short Circuit	ECE R100 Annex 8F SAE J2929 Sec 4.8 SAE J2464 Sec 4.5.1 UN 38.3
Coolant Flood	Proterra Internal
UN/DOT Transportation	UN 38.3
Single-point and Multi-point Over Charge	SAE J2929 Sec 4.9 SAE J2464 Sec 4.5.2 ECE R100 Annex 8H
Single-point and Multi-point Over Discharge	SAE J2929 Sec 4.10 SAE J2464 Sec 4.5.3 ECE R100 Annex 8H
Single-point and Multi-point Thermal Control Failure	SAE J2929 Sec 4.11 SAE J2464 Sec 4.4.3 ECE R100 Annex 8I
Fault Analysis	SAE J2929 Sec 4.12
Protection Against High Voltage Exposure	SAE J2929 Sec 4.13



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Key Features

BODY TYPE

- 12.5m ultra-low floor 2-door city bus with seating capacity of 44, incorporating 2 wheel-chair positions with flip-up seats and standing capacity of 25
- BusTech integrated chassis platform
- All base panels are replaceable

BATTERY FEATURES

- Proterra cell-based battery pack with Li-Ion batteries. Up to 400km of range provided by 452kWh (4 x 113kWh packs) of battery capacity with initial usage capacity of 405 + 15Kwh (5% reserve)
- ISO 26262 low-voltage backup system for powertrain and steering

CHARGING

- CCS2 ISO 15118 single charge point, Rear O/S
- 8 hours slow charge (50kw 0 – 100%) or 2 hours fast charge (500kW 0 – 100%)

DRIVETRAIN

- ZF AVE130 portal axle, 2 integrated wheel motors with an output of 250 kW/170 HP, torque of 485 NM/motor and max speed of 100kmph
- Wabco EBS/VSC

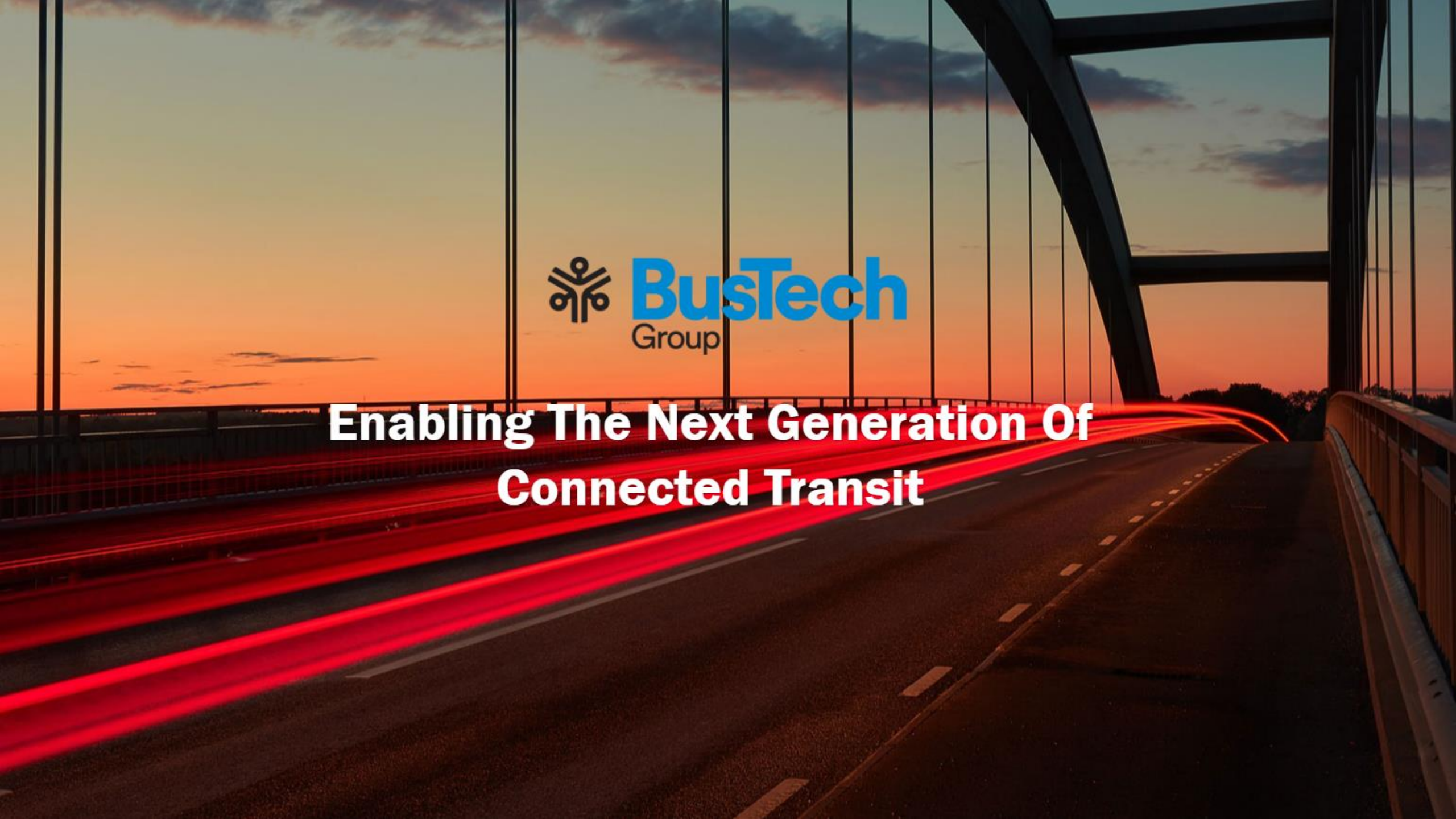
DRIVEABILITY

- Tyres: 295/80
- Drivers Assist: ADAS – Mobil-Eye
- Power Steering: EHPS electric power steering
- Suspension: WABCO ECAS with 2 front and 4 rear airbags
- Wheels: Alloy rims

CABIN

- HVAC: Thermoking E1200
- Doors: SMC or Ventura – electric twin glide

*Based on energy consumption of 1kWh per km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Group
Enabling The Next Generation Of
Connected Transit