



Optare

Buses Delivering Net Zero

An OE View



ASHOK LEYLAND

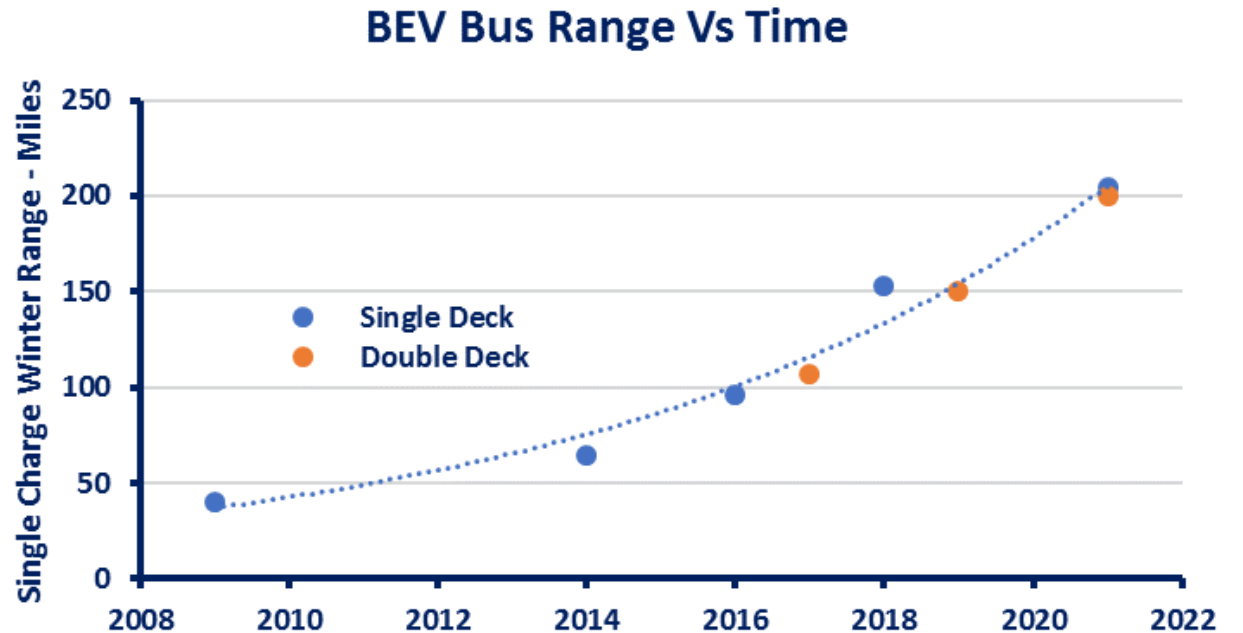
Delivering Net Zero – The Bus Journey

- Bus can be a key component in delivering net zero
 - Rapid growth in ZE capability
 - Electrification on the rise
- Key enablers required
 - Technology
 - Whole Life Cost
 - EV Culture
 - A Net Zero Canvas



The Net Zero Bus Journey - Technology

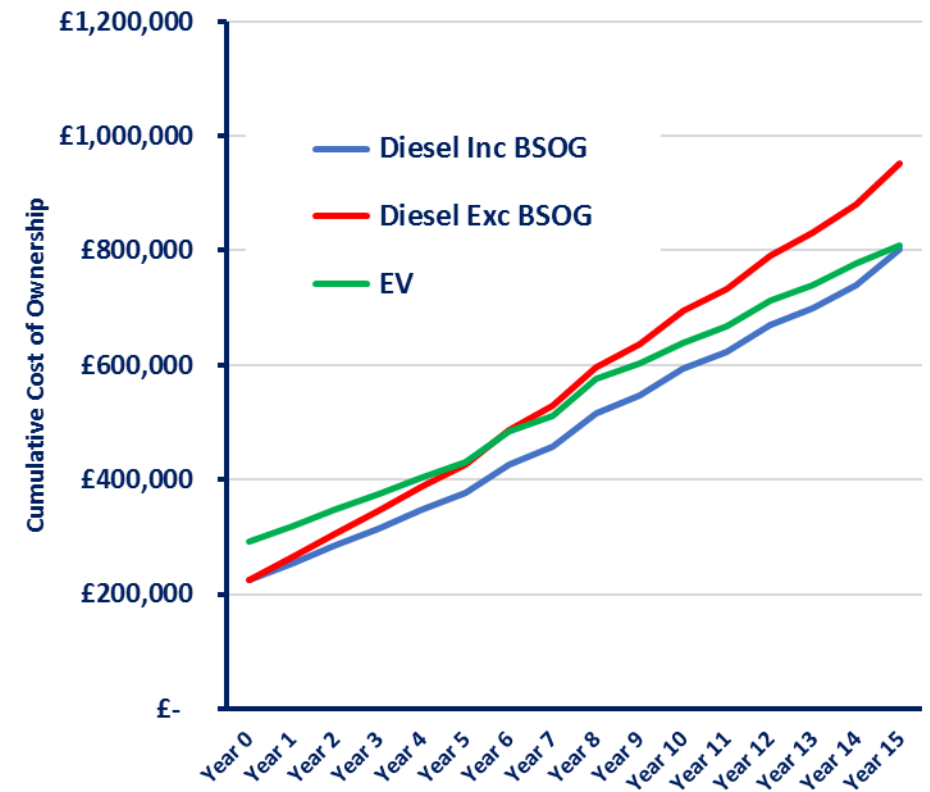
- ZE buses must be fit for purpose
- Range a key metric
- Limited range means cost
 - Vehicles
 - Infrastructure
 - Drivers
- Range growing exponentially
- Vehicle energy a constraint until 2025...



The Net Zero Bus Journey – Whole Life Cost

- EV cost & battery life inflates whole life cost Vs E6
- Running costs offset high capital costs
- WLC parity Vs E6 via battery “lease”
 - Double deck a better case than singles
- Changes to BSOG can bring EV WLC leadership
- The model will improve as EV costs reduce

Double Deck BEV
Cumulative Whole Life Cost Vs E6 Diesel
Exc BSOG Exc OLEV & Inc Battery Lease



The Net Zero Bus Journey – ZE Culture

- Diesel to ZE shift involves a major culture change for operators
- ZE success reliant on adoption of its culture
 - Route planning
 - Charging
 - Pre-heat
 - Driving
- All but charging will become less important as range grows



The Net Zero Bus Journey – ZE Canvas

- A healthy industry will invest
- Adverse ridership trends are limiting investment
- Need to act to drive bus traffic
 - Bus centric urban transport
 - Withdrawal of the car from city centres
 - Support for the network
- Build it & they will come..



York councillors approve scheme to ban cars in the city centre by 2023

The Net Zero Bus Journey – Summary

- BEV range is closing on magic 200 mile target
- BEV Vs E6 Whole life Cost parity is close
 - BSOG reform a key enabler
- Success will be based on operators absorbing of a ZE culture
- Bus can only succeed with the right canvas

