



# Decarbonisation

A bus operator's journey, or conundrum!

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# About us

- The UK's largest bus operator with 23,000 employees and 8,200 vehicles (23% of total)
- Over half a billion passenger journeys on our buses each year.
- £1.63bn annual aggregate GVA contribution to the UK economy - £580m in supply chain
- Investing over £260m this year in fleet and infrastructure



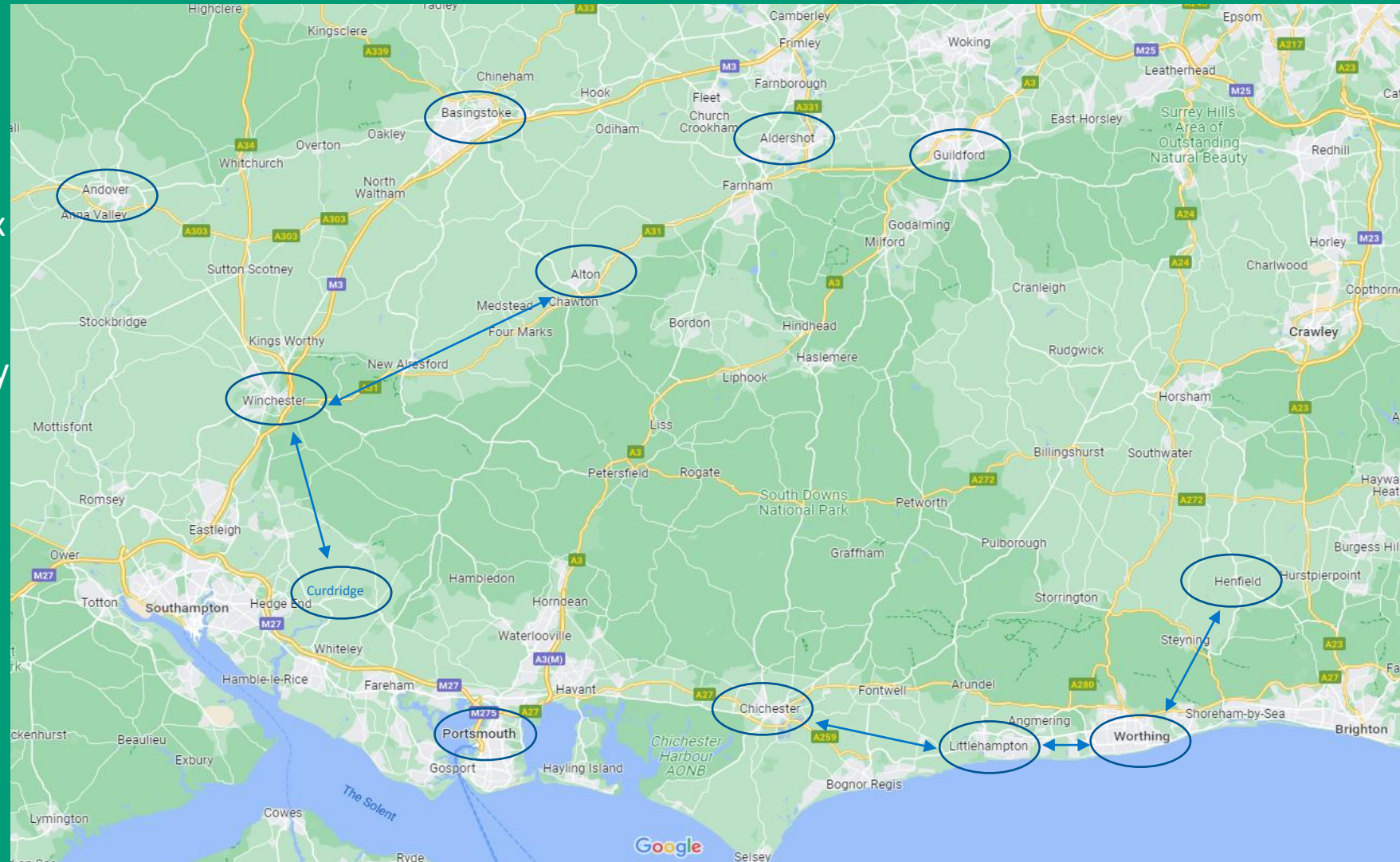


# About us

Locally we are Stagecoach South  
with **8 operating depots** across  
Hampshire, Surrey and West Sussex

We run over **425 buses** and employ  
over **1,400 people**

...more locally...we have a depot in  
Winchester, with **45 buses**, and  
employ **130 people**



## How buses work:

- Operators provide services without any direct subsidy. Operating costs are covered from the fares taken, in the main
- Where there are gaps in the market, which can be described as “Socially Necessary” LAs can tender and provide financial support to enable them to operate
- Vehicle investment for diesel buses comes from the operator, without any liability on the tax payer
- HM Government have launched various schemes to aid with bridging the gap for investment between a diesel bus and an alternative fuel bus

## Current Position:

COVID hit the bus industry hard – some people are still nervous to travel by bus – we are not back to pre-covid patronage levels

# Our Decarbonisation Journey

- Zero Emission Fleet, nationwide across Stagecoach Target by 2035
- Fully net zero nationwide across Stagecoach Target by 2050
- Reduction in GHG (scope 1&2) from 2012 levels Target 30% reduction by 2026
- Carbon Disclosure Project rating Target 'A' rating by 2026
- Waste diverted from landfill Target 95% by 2026



# By 2035 – zero emission fleet

## Clean Diesel (Euro 6)

- Range of about c300 miles a day
- A Euro 6 bus delivers a 67% reduction in Nox
- Quick fill
- Easy depot infrastructure
- Entails emissions generating vehicle to deliver diesel
- Cheaper than alternative fuels



## Biogas

- Range of about c250 miles a day
- Bio-methane is taken direct from the mains, - no fuel delivery from road tankers
- Heavy Depot Infrastructure
- Speed of fill
- Bio-methane gas offers more than 85% reduction in greenhouse gases compared to older diesel buses
- Is it the Betamax?



# By 2035 – zero emission fleet

## Electric Vehicles

- Range of about c240 miles a day
- Battery replacement, after, say 7 years
- Heavier vehicle – more tyre wear etc
- Depot infrastructure – does the grid have capacity?
- Once grid connected easy to make marginal additional vehicles



## Hydrogen Vehicles

- Higher range of about c280 miles a day
- Heavy Depot Infrastructure
- Speed of fill
- Greater H&S
- Tail pipe emission is just H<sub>2</sub>O
- Can be very expensive
- Difficult to make marginal change due to plant costs
- Supply of Hydrogen?



# More questions.....

## **Which Fuel Type?**

EV, Hydrogen, Gas, Diesel, Back up supply?

## **Depot Infrastructure**

Hydrogen Storage Plant, Batteries on site, Mains Grid Connection, Diesel Fuel Tank, Gas station

## **Charging**

On site, in depot, Opportunity charging, Off site charging  
Enough power in the grid (yes, today, but not tomorrow!)

## **Maintenance of fuel**

Diesel pump maintenance, Plugs, Sockets, Charger Speed, Charger capability and functionality, Maintenance of chargers

## **Where are the buses going to operate**

Terrain, daily range, hours of operation (24 hour bus services?)



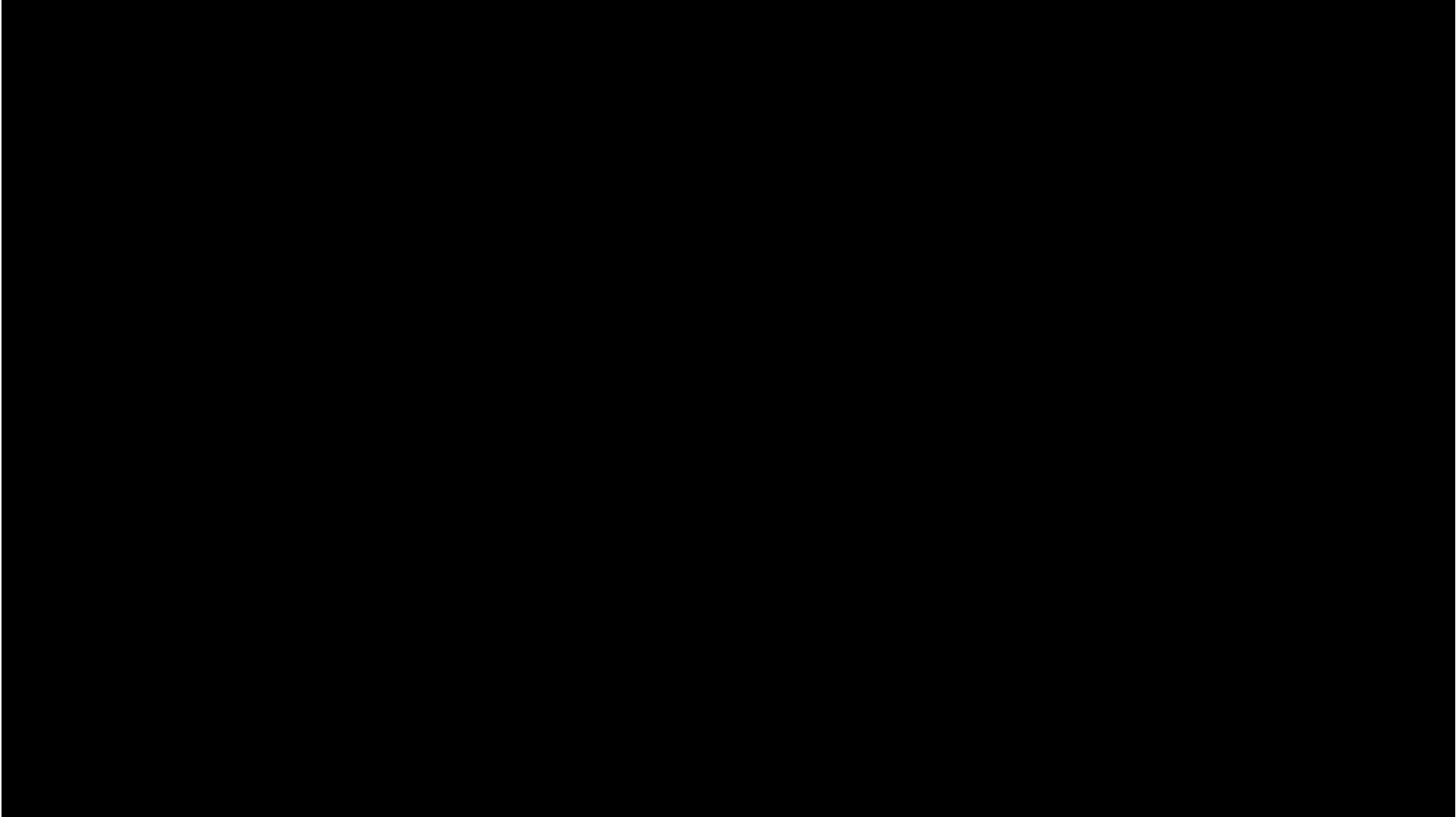
# More challenges.....

We operate 9 electric buses at our Guildford depot – since 2019

We don't have enough energy in the grid to charge all the buses

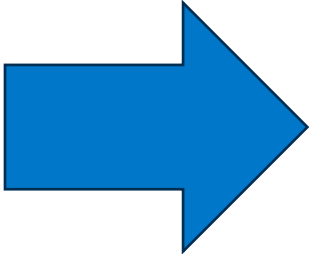
We charge Tesla Batteries during the day to top up the grid charging at night







# And more challenges.....



**Air Quality** ✓



**Bus Quicker ?**

**Any questions.....**