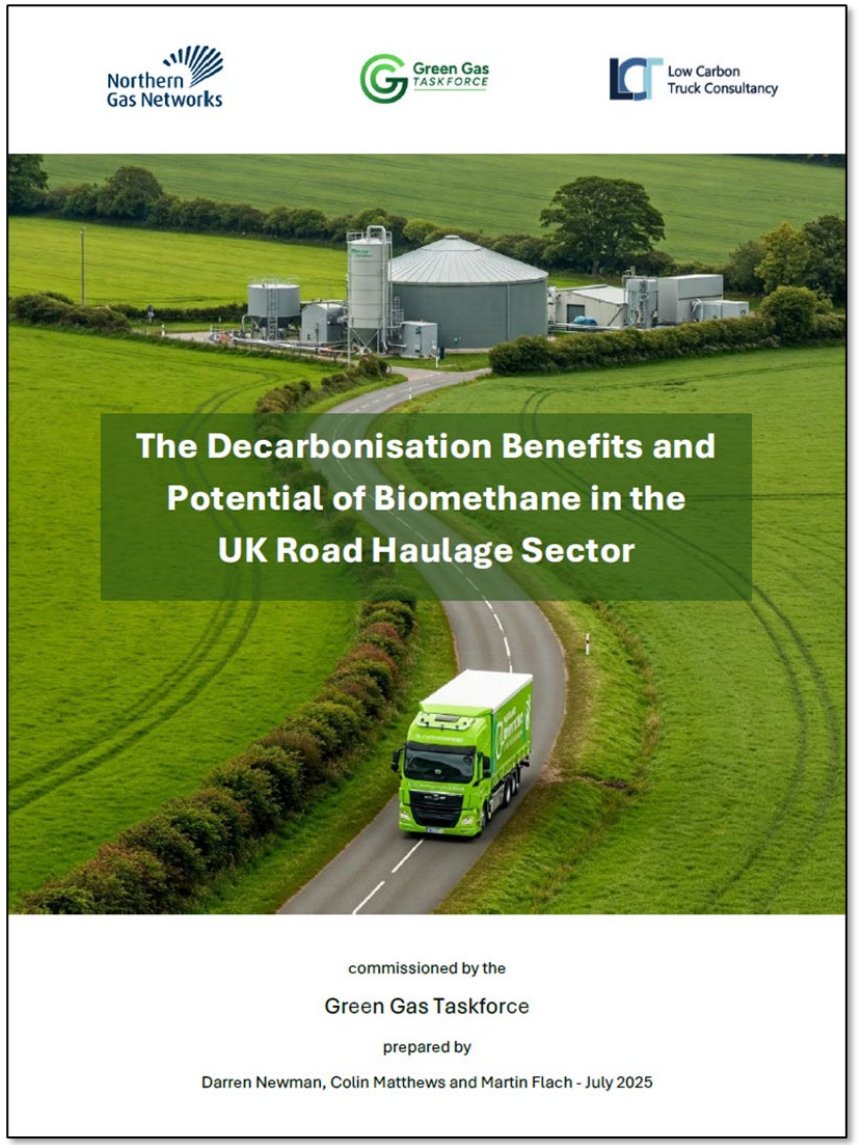
Low Carbon Truck Consultancy

Darren Newman

The Decarbonisation Benefits and Potential of Biomethane in the UK Road Haulage Sector



Co-Authors

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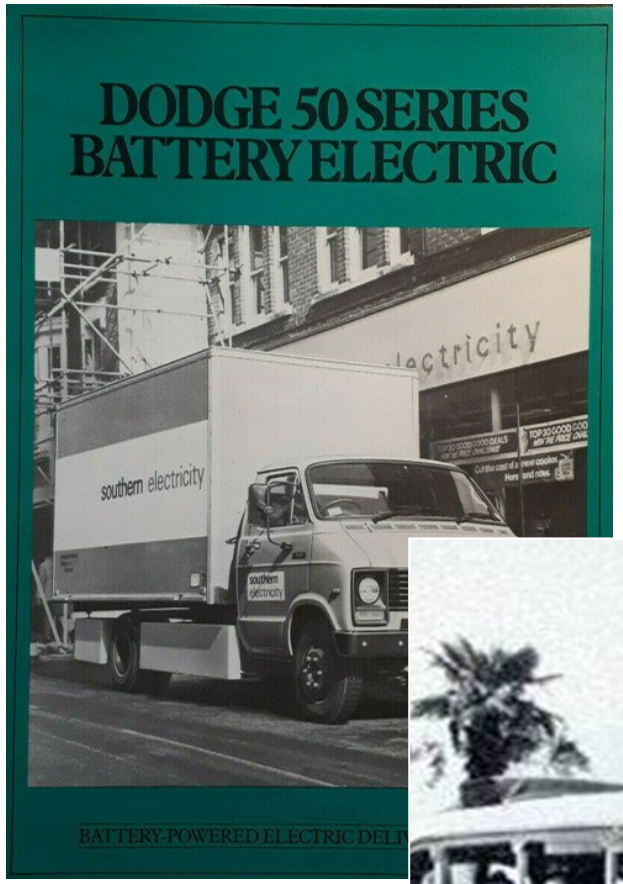
Biomethane Delivers

- Faster decarbonisation than ZEVs due to the high-power nature of gas transmission systems and the dispatchability of energy-dense gas.
- Savings for operators and fuel duty revenue for government, both of which can offset the cost of new electricity grid connections and purchasing ZEVs.
- A wider pathway for operators to meet their decarbonisation goals across differing operating models.
- Action from operators on net zero.
- Displacement of high CO_2 intensive diesel, rather than lower CO_2 intensive fossil gas.
- A greater focus from manufacturers promoting renewable technology.
- Important negative CO_2 life cycle emissions, needed for the net zero balance sheet.

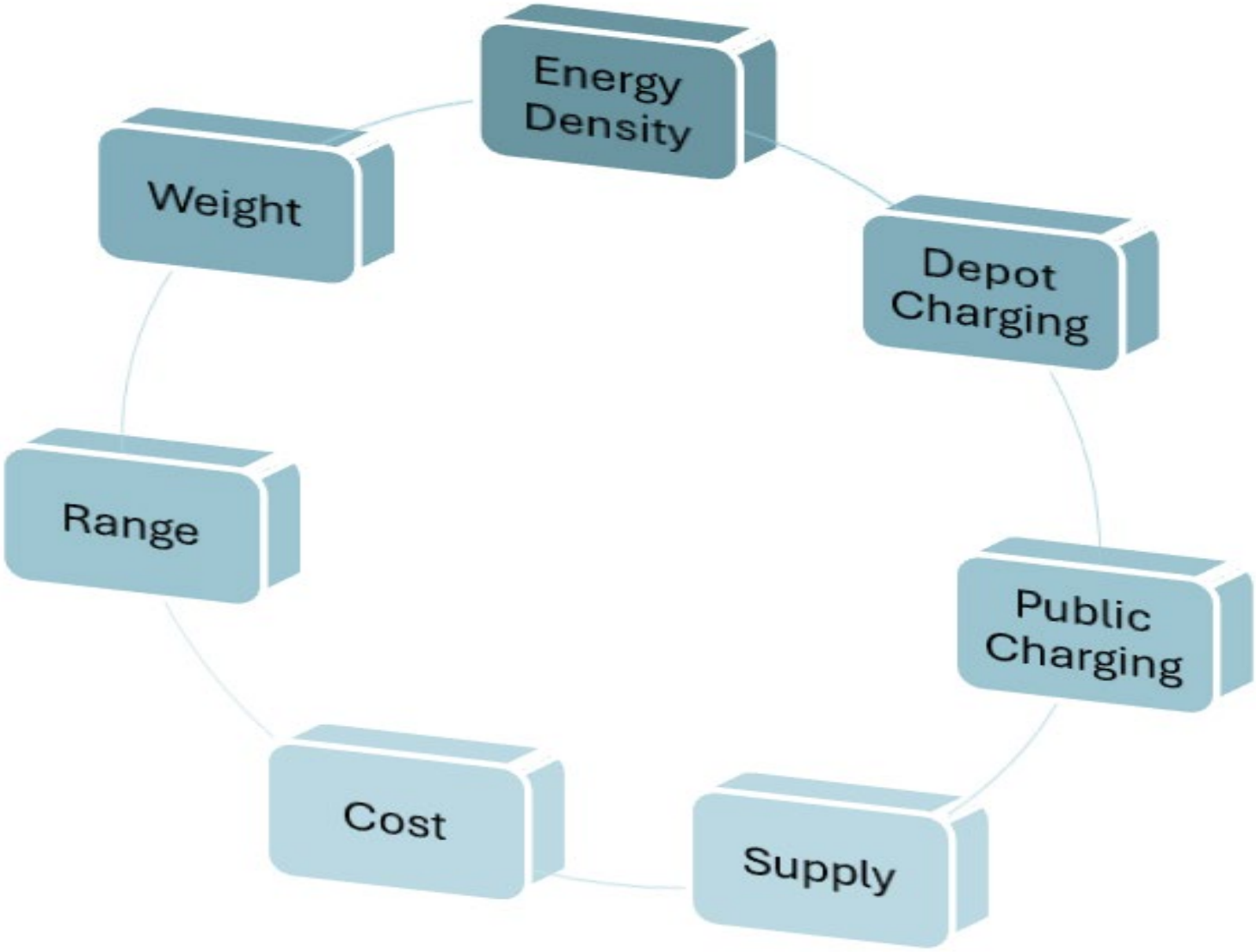
Questions the Report Attempts to Answer

1. Would future UK regulations for HGVs be able to deliver faster decarbonisation if it included a legislative pathway for biomethane in road freight transport?
2. Where could biomethane have the biggest impact in the decarbonisation of transport?
3. What would the CO_2 impact be?
4. What needs to happen to deliver these benefits?
5. How would biomethane adoption affect the adoption of ZEVs?

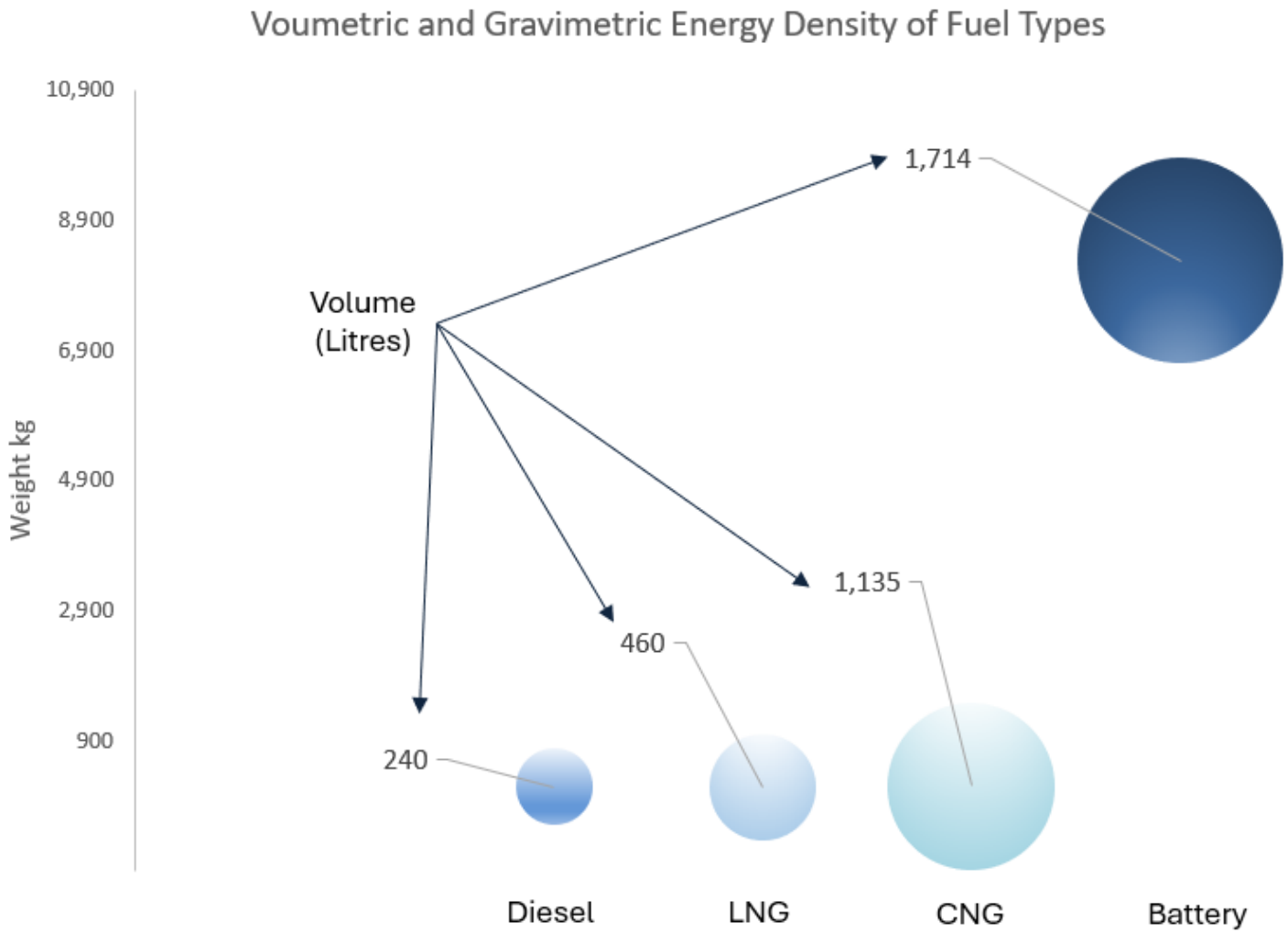
Pathways to Decarbonise Commercial Vehicles



Constraints to EV Adoption



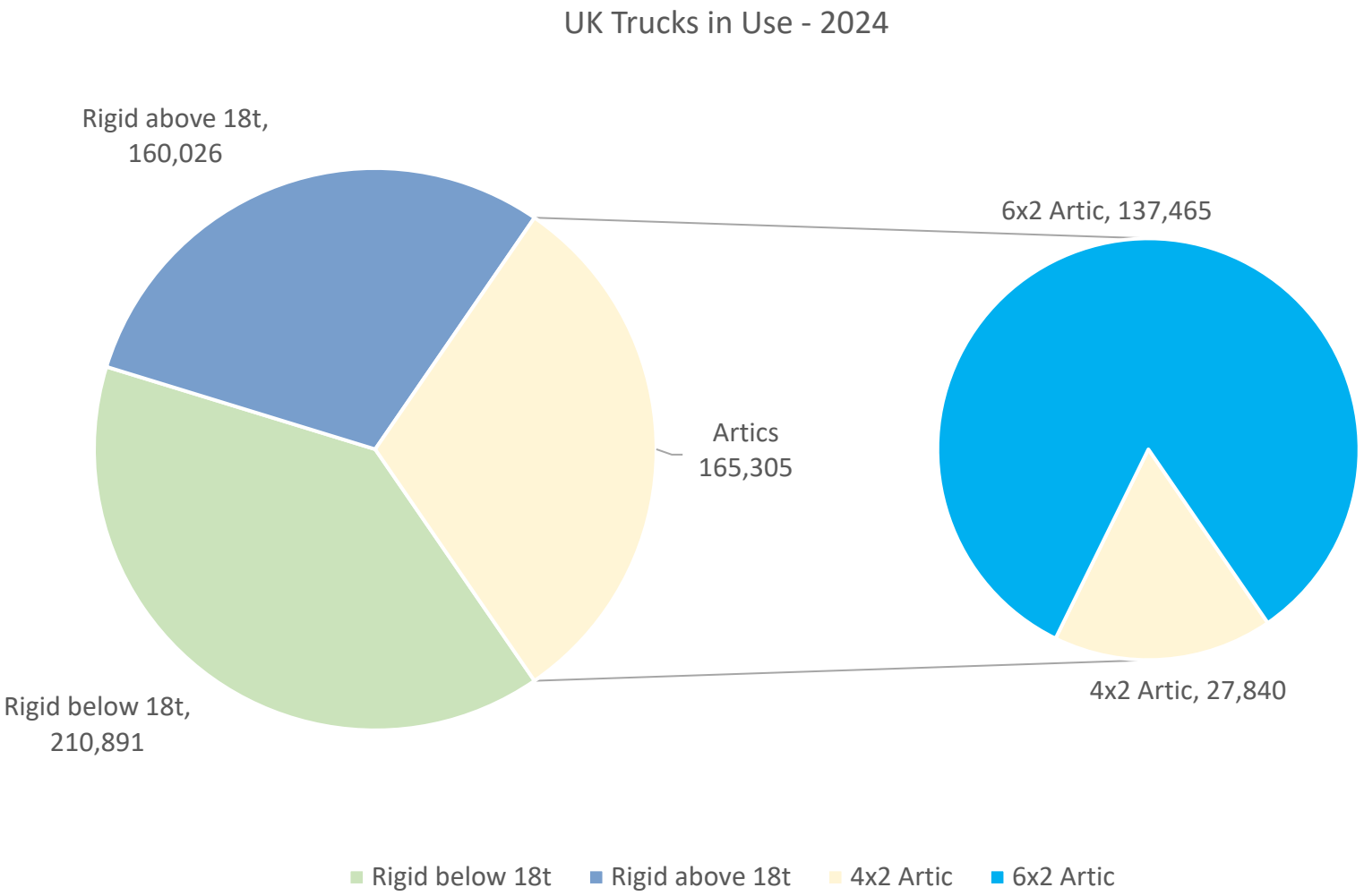
The Energy Density Problem



Practicality of Solutions

	Performance	CO2 Reduction	Payload	Versatility	Range	Refuelling / Infrastructure	TCO
Battery Electric							
Hydrogen Fuel Cell							
HVO							
Bio Methane							

The UK Truck Market



Scenarios for Regulation

1. **Scenario 1**

   In this scenario, the fuel duty differential ends in 2032, resulting in an immediate negative impact on vehicle sales, reducing parc and CO_2 benefits over the next 8 years.

2. **Scenario 2**

   Fuel duty differential is maintained beyond 2032.

   Annual sales growth to 20% of new registrations.

   Stabilising at 20% of vehicle parc up to 2040 when the ZEV mandate is proposed.

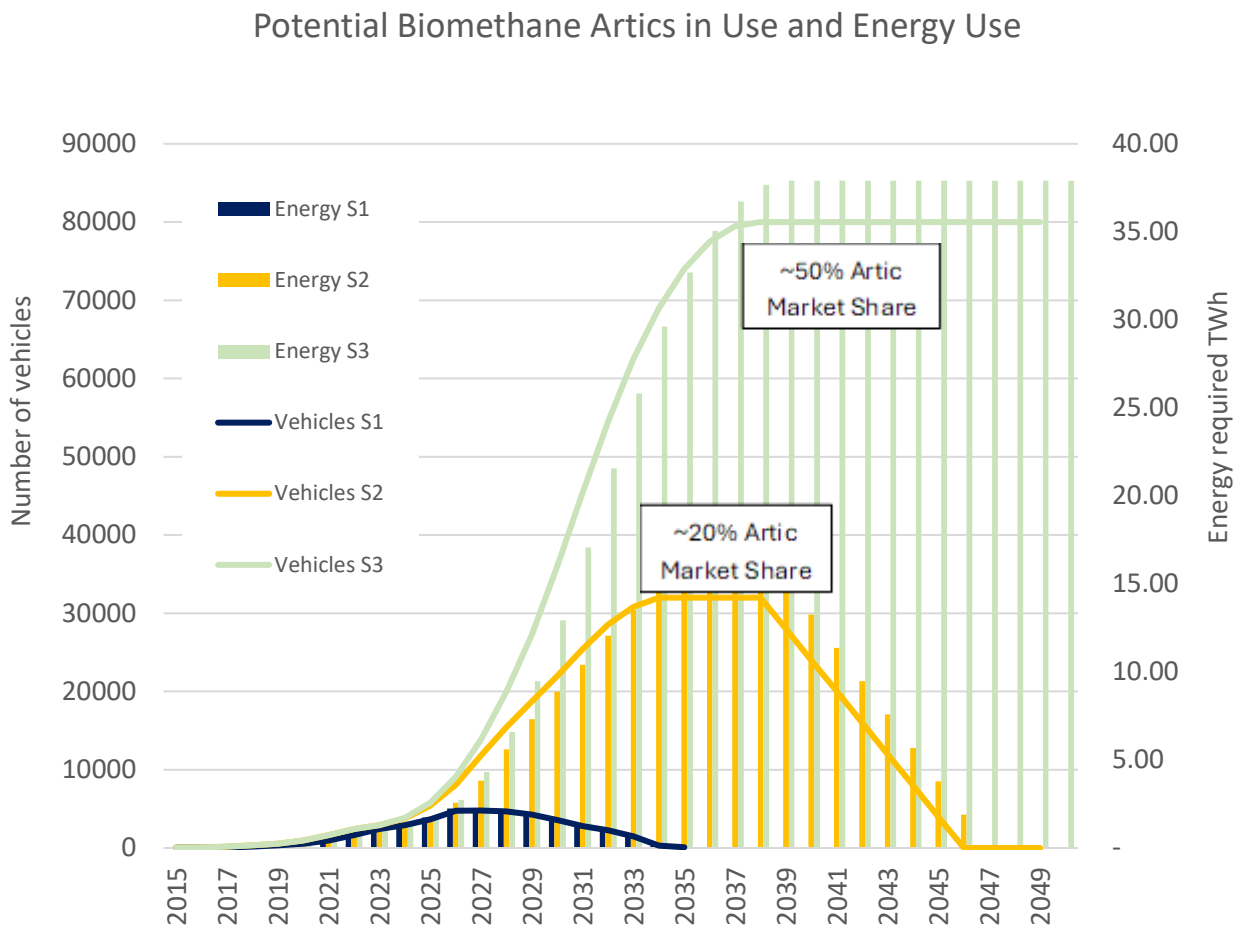
   Sales will cease then and the vehicle parc will diminish over the next few years.

3. **Scenario 3**

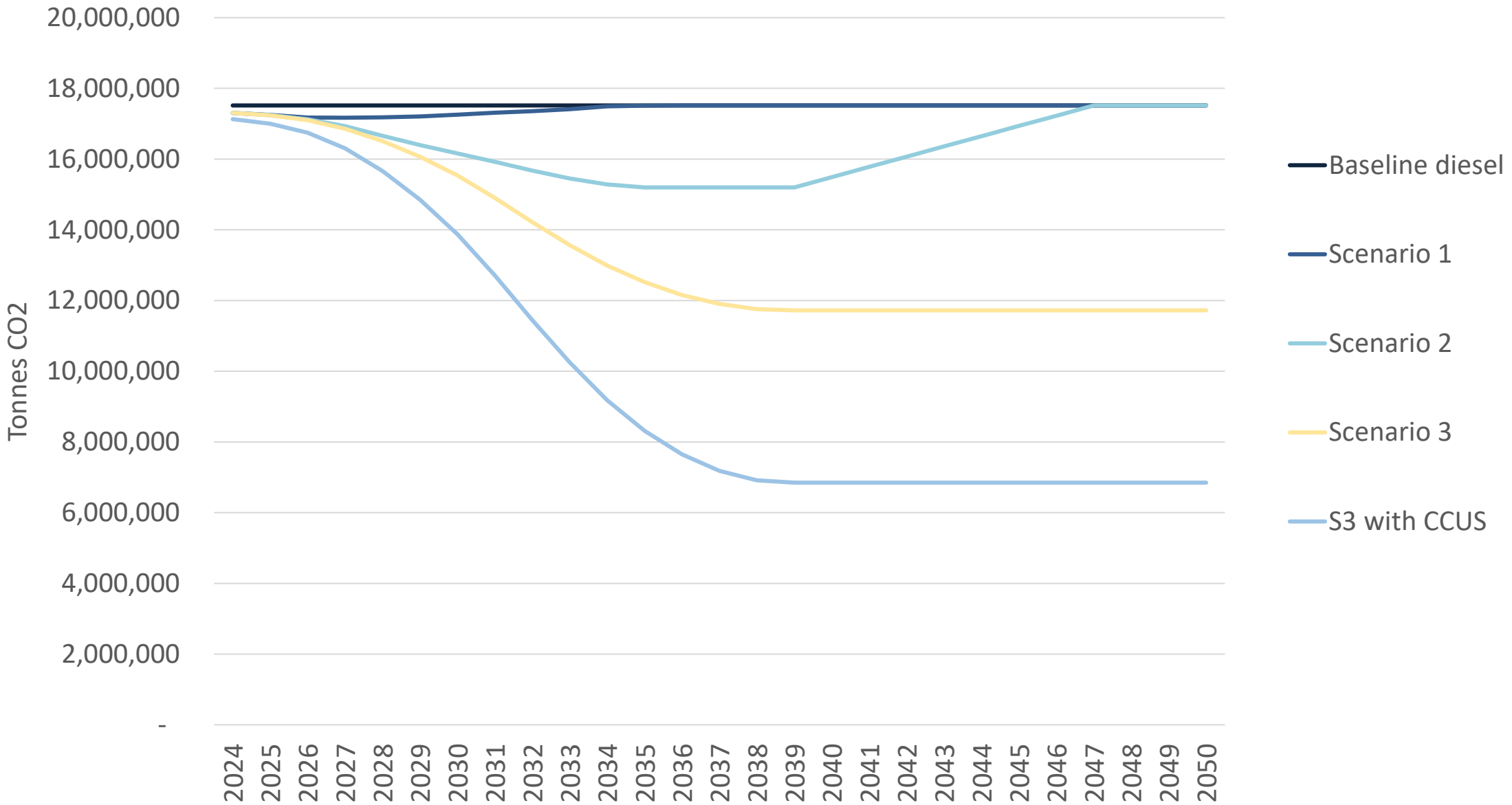
   OEM vehicle CO_2 targets revised from tailpipe to WtW.

   OEMs continue biomethane vehicle development and sales post 2040 and potentially post 2050.

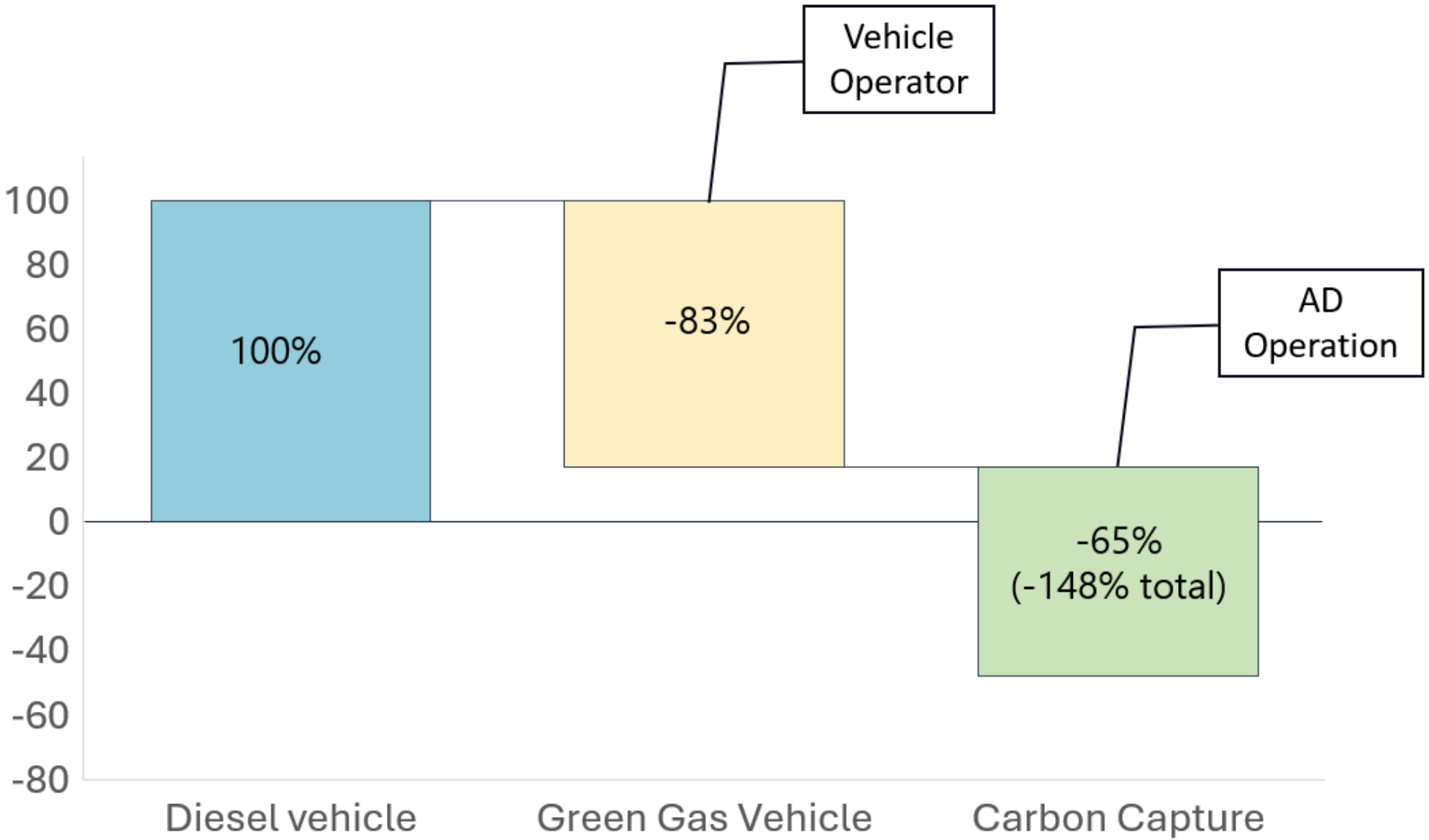
   In this scenario, growth of annual biomethane vehicles could reach 50% of the market.



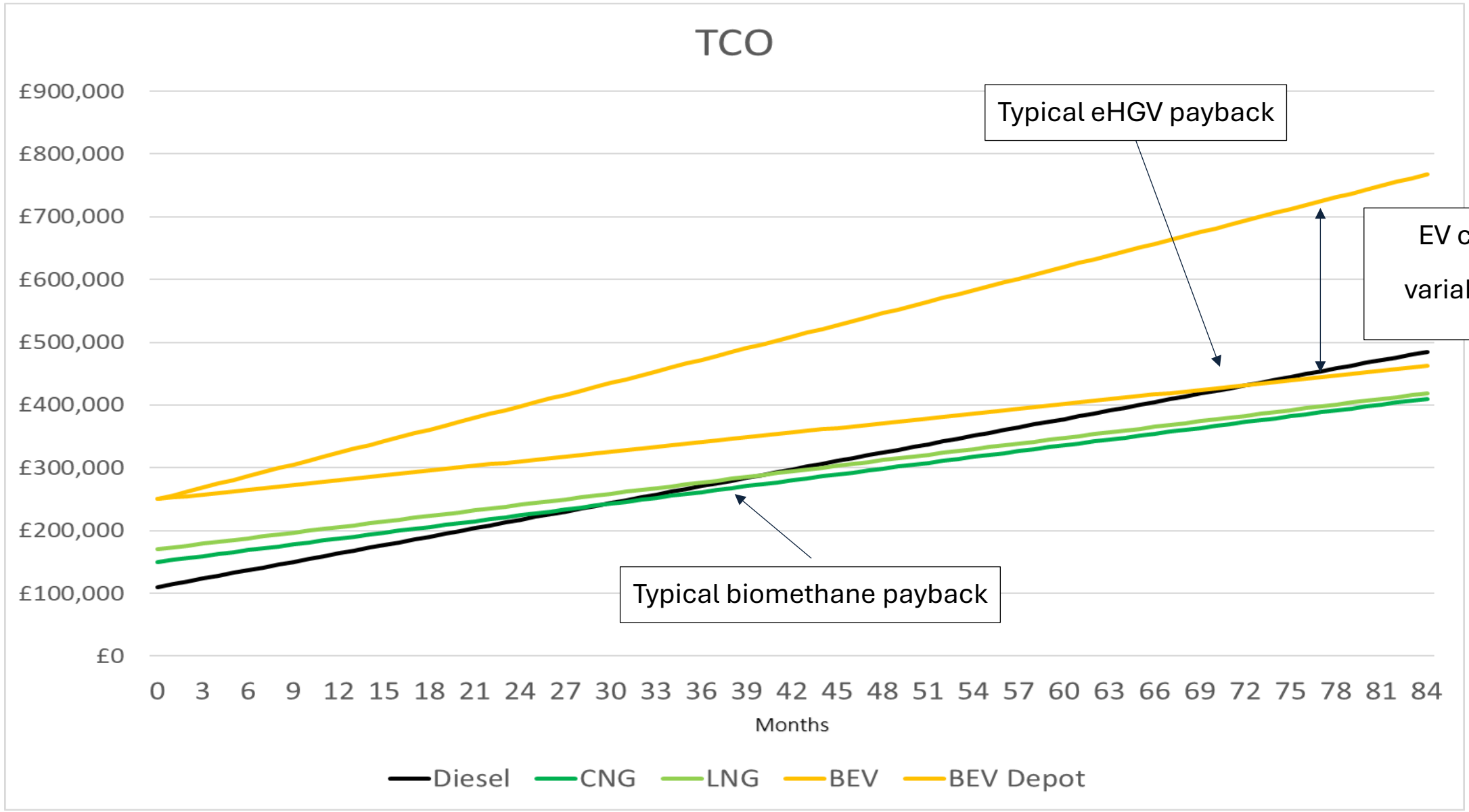
Potential of Biomethane on CO2 Emissions



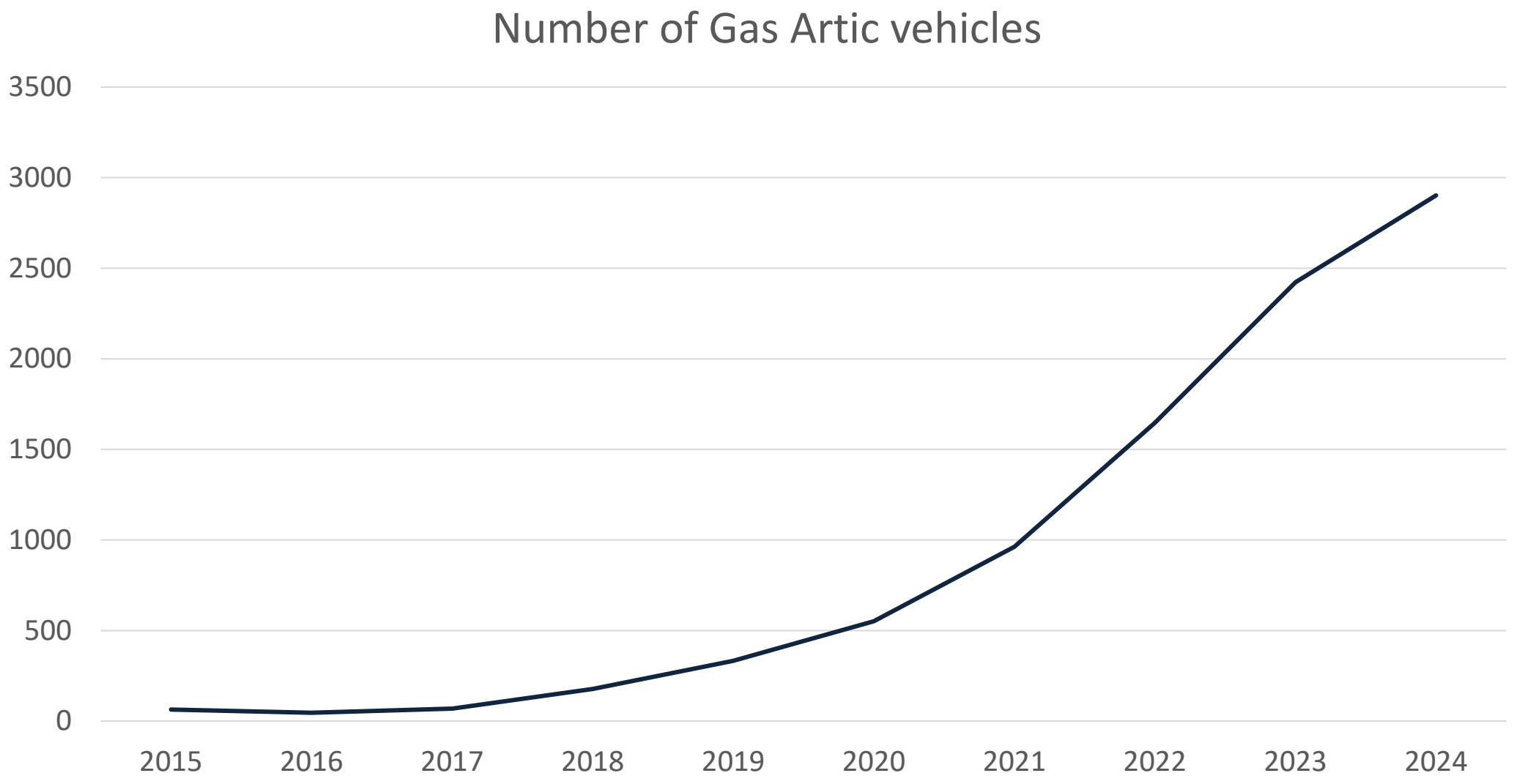
Green Gas with Carbon Capture



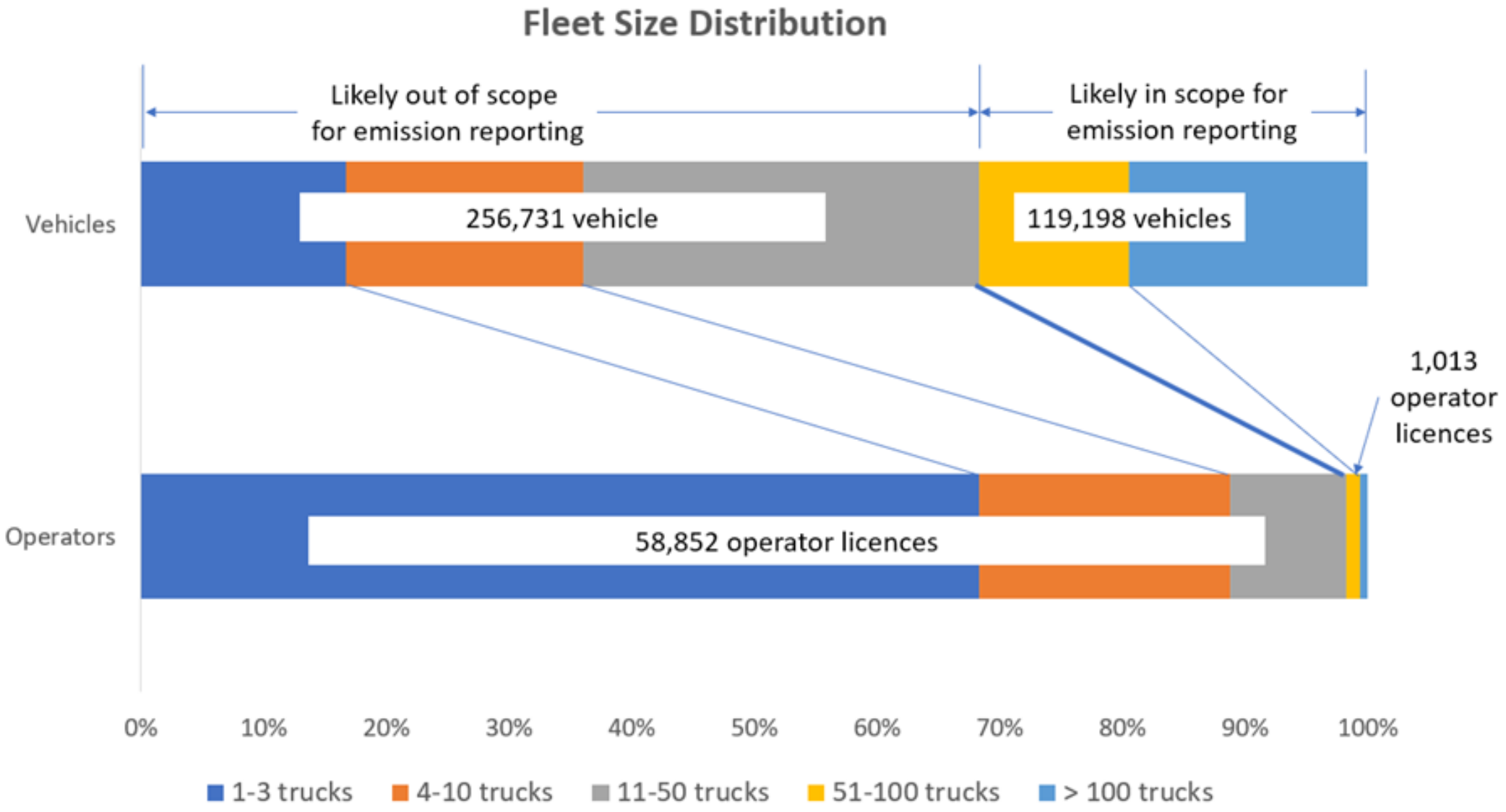
Total Cost of Ownership



Growth in Biomethane Vehicles



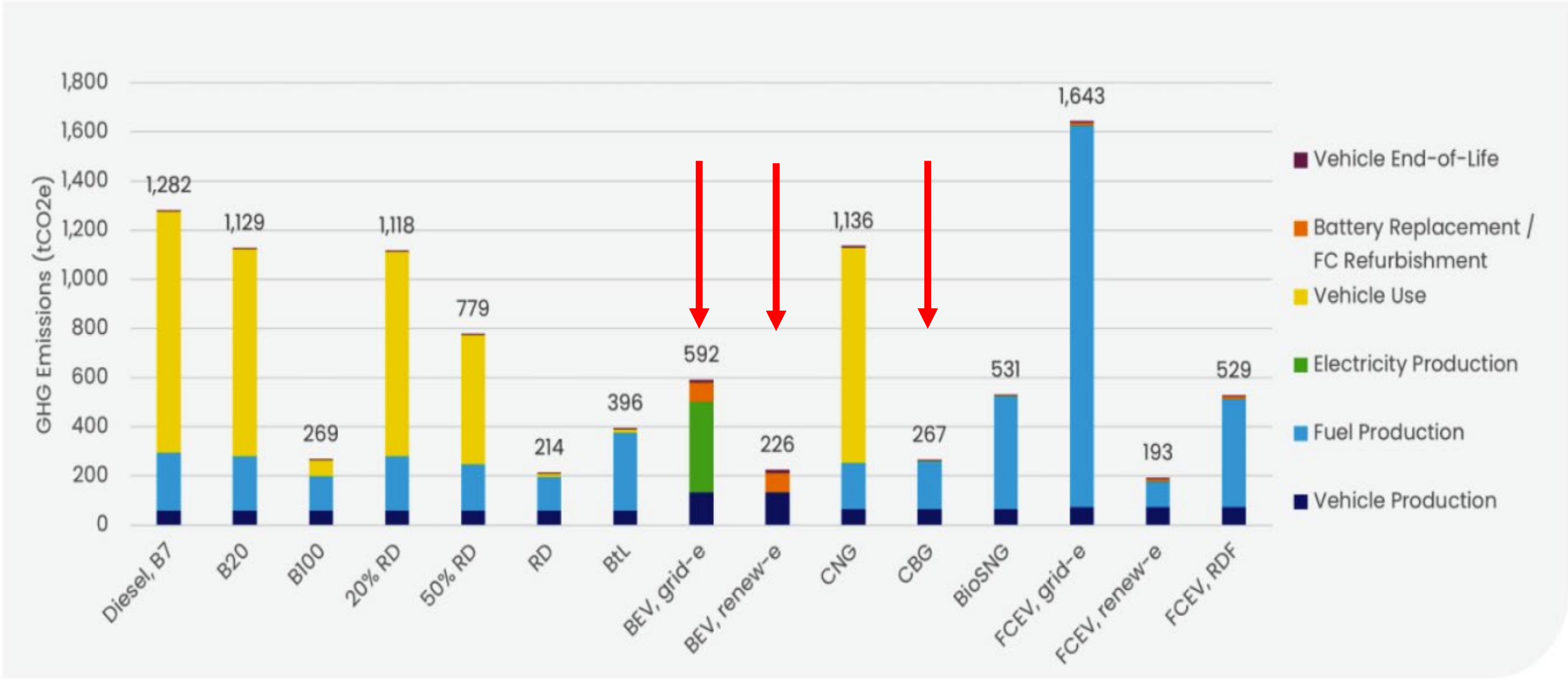
Operators and Vehicles



Biomethane Refuelling Stations

- The UK has 33 bioCNG stations (13 more planned)
- The UK has 37 bioLNG stations (10 planned)
- 15,000 trucks per day (10% of current artic volumes – 4,000 by end of 2025)
- This could be easily expanded to cover over 50% of the artic market

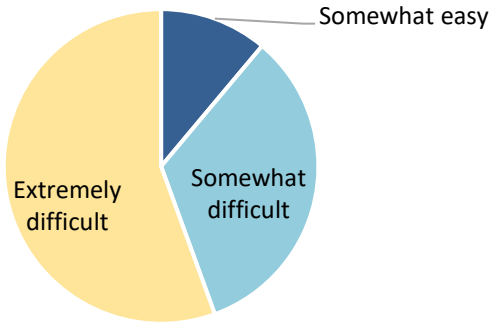
Life Cycle Analysis (LCA)



Without CC

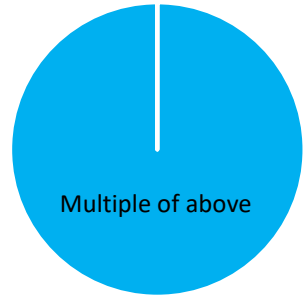
Operator Responses

Ignoring cost, how easy do you think it would be to electrify your entire fleet?



Very easy | Somewhat easy | Somewhat difficult | Extremely difficult | Don't know

What do you think are the main obstacles to electrifying your fleet?

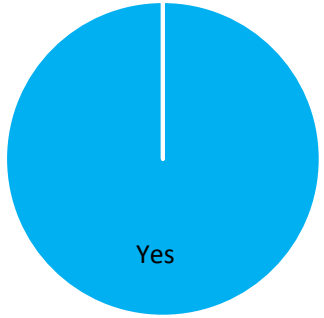


- No significant obstacles
- Capital cost
- TCO
- Infrastructure (public charging)
- Energy supply to site
- Operational constraints
- Multiple of above
- Other

Do you believe ZEVs should be the only method to decarbonise freight transport in government regulation?

Yes, it the right thing | No, we need more options | Not sure

Do you believe renewable fuels should be a valid way to decarbonise your fleet within government regulations?



Yes | No | Don't Know

Policy Recommendations

Fuel duty

The fuel duty discount should be restricted to only biomethane.

The discount must be extended until 2045.

CO2 regulation

Future HGV CO2 regulation must recognise the carbon-neutral biogenic nature of biomethane.

RTFO mechanism

Raising the RTFO targets beyond 2030 and index linking the RTFC buyout price

Summary

- Fast decarbonisation of road freight transport, complimentary to electric
- Cost effective – for operators (fuel duty discount), revenue for treasury
- Effective – 90% of operations and applications can be accommodated
- Minimum regulatory changes would facilitate significant market growth