



**Johnson Matthey**  
Inspiring science, enhancing life

# Technology neutrality considerations for transport decarbonisation and air quality

**John Goodwin**

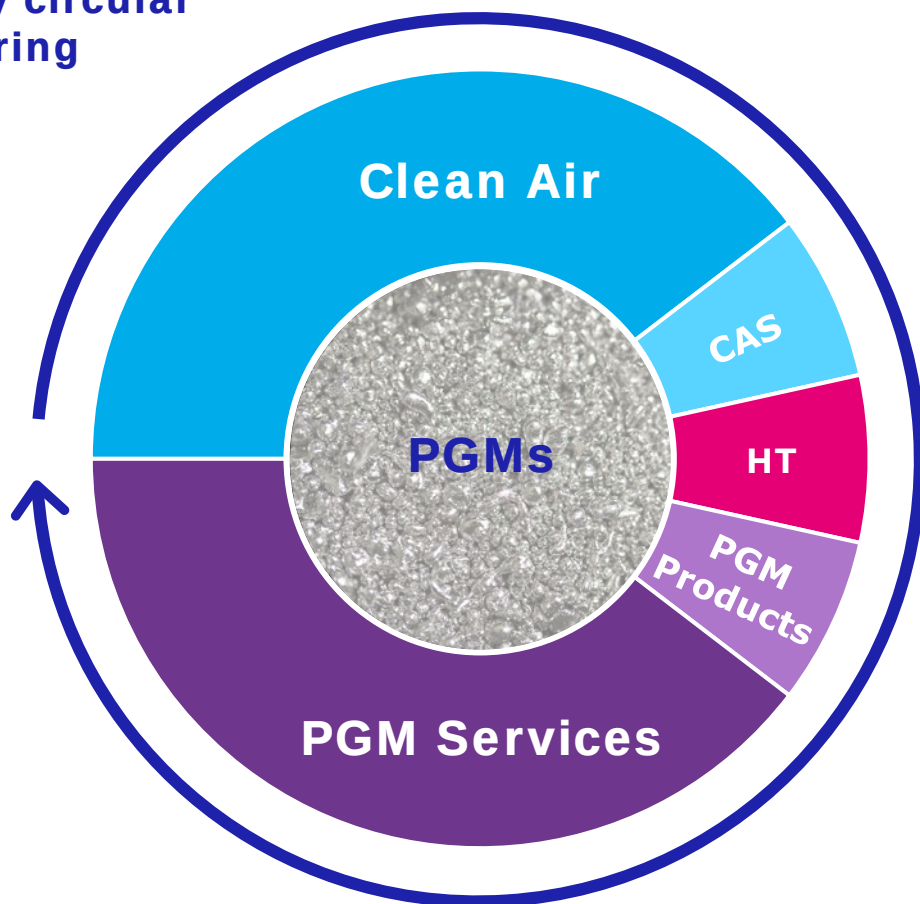
AECC-IPA, Brussels 29<sup>th</sup> October 2026



*Confidential*

# Metals that matter, for a healthier world, 209 years of innovating

Fully circular  
offering



- 1 **PGM expertise** underpins the group
- 2 **Strong core businesses with leading positions** – Clean Air and PGM Services
- 3 **Driving growth**<sup>1</sup> leveraging core technology
- 4 **A step change in cash generation**
- 5 Delivering **enhanced shareholder returns**

Note: PGM – platinum group metal, CAS – Clean Air Solutions, HT – Hydrogen Technologies.

1. Growth opportunities across CAS (within Clean Air) with Cormetech acquisition, PGM Products (within PGM Services) and HT (reported separately).

# Opening Context

## Light duty leads the debate: EU Automotive Package launched in December 2025 and now in full swing of legislative process



*A few moments later...*



*Walked a tightrope in her State of the Union speech in 2025*

Likely end of 2035 'ice ban' but CO<sub>2</sub> stakeholder battle underway; more flexibilities vs. no change at all.

## Cars and vans – regulatory ambition outpaces market reality

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- Pressure on CO<sub>2</sub> / ZEV rules in EU, US, UK
- BEV-only vision is showing huge challenges, and China progresses NEV approach
- In Europe, CO<sub>2</sub> rules under review – proposed removal 2035 ICE ban, short term flexibilities granted
- UK consulting on ZEV mandate review for cars and vans

## And trucks?

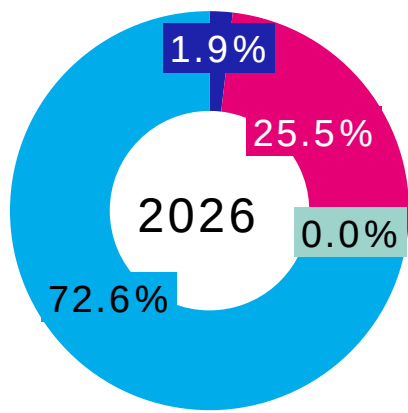
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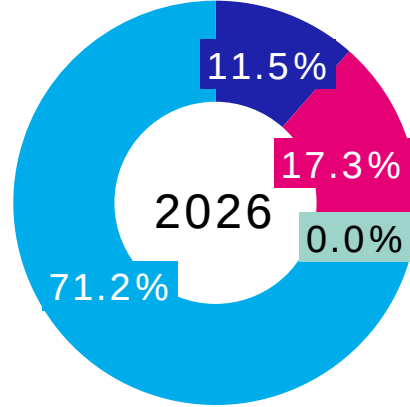
- US rule book on CO<sub>2</sub> ripped up
- Europe CO<sub>2</sub> rules review clause in 2027 called for now
- Short term flexibilities on CO<sub>2</sub> for HGVs in Europe, 2025-2029 credits to help with 2030 compliance
- Awaiting UK Government response to HGV decarbonisation consultation

# Light-duty, Heavy-Duty, NRMM: Global view by powertrain

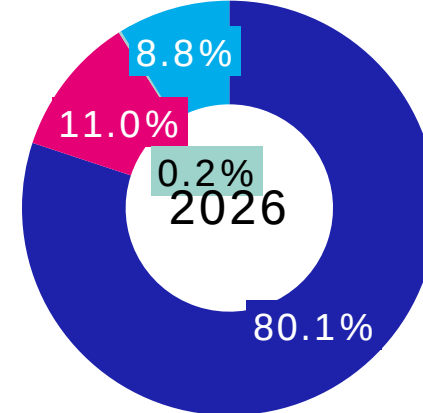
## Evolution 2026 - 2035



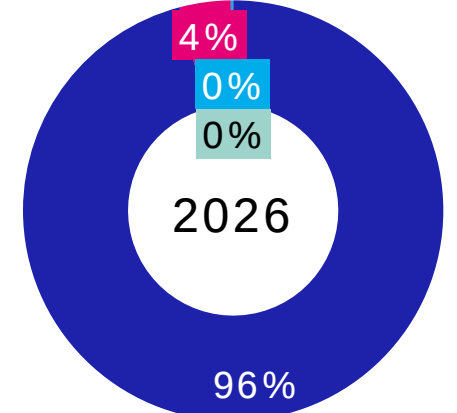
Cars



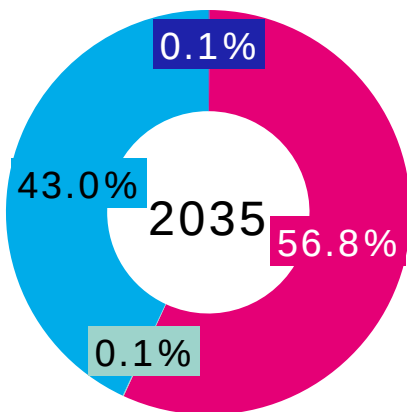
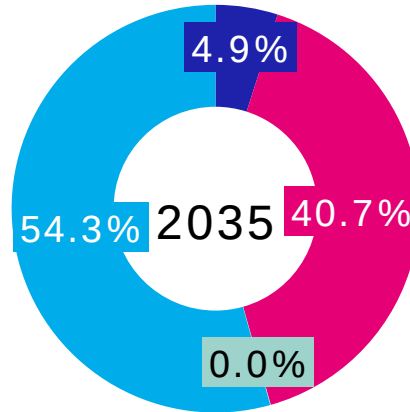
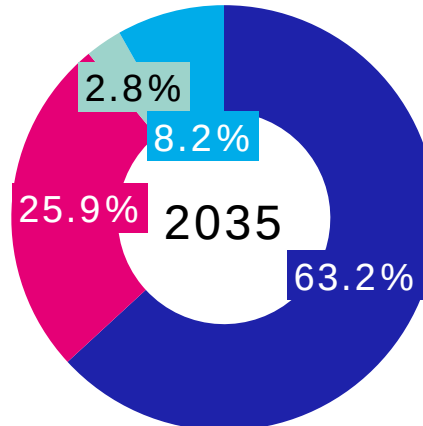
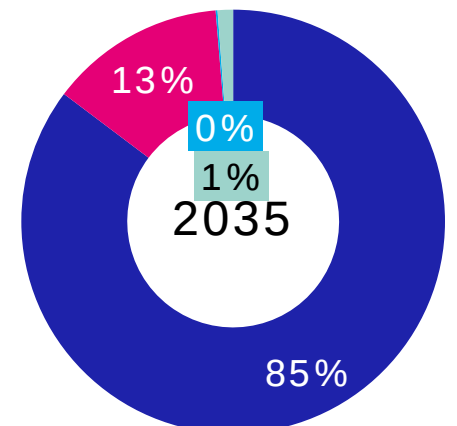
Light Trucks



Heavy-duty



Construction Equipment



# Decarbonising in a technology neutral way

# SPOT THE DIFFERENCE



**Different pathways, same destination:  
Decarbonised, clean, light-duty transport**

Lifecycle CO<sub>2</sub>  
emissions



Renewable fuel

Renewable electricity

Air quality



Zero impact  
emissions

Zero (tailpipe)  
emissions

# VEEFs vs BEV was I being fair?

Probably not, because there are many considerations when looking at technology assessment.

And that's why technology neutrality is important.



# The technology considerations get more complex as the vehicle use case gets more complex

As we move from cars to long-haul trucks, and beyond into non-road, technology neutrality becomes even more important.

- Vans are not large cars
- Trucks have different delivery missions

| Application      | Decarbonisation pathways       |
|------------------|--------------------------------|
| Urban cars       | BEV, hybrid/VEEF               |
| Rural Cars       | hybrid/VEEF, BEV               |
| Vans             | BEV, hybrid/VEEF               |
| Regional trucks  | BEV, H2 ICE, FCEV, hybrid/VEEF |
| Long haul trucks | H2 ICE, FCEV, hybrid/VEEF, BEV |
| Coaches          | BEV, H2 ICE, FCEV, hybrid/VEEF |

BEV = battery electric vehicle, VEEF = vehicle exclusive to eligible fuel, FCEV = fuel cell electric vehicle, H2 ICE = hydrogen combustion engine

## Enabling technology for cleaner air

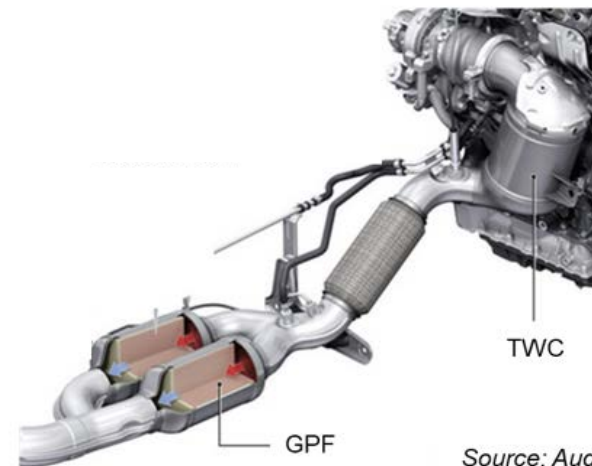
# Evolving emissions control technology creates cleaner air for us all

## Euro 6a/b

Single Three-Way catalyst



## Light Duty Gasoline



## Euro 6d

(=Euro 7)

Introduction of gasoline particulate filter (GPF)

## Euro VI D/E

Single dosing SCR with DOC and DPF



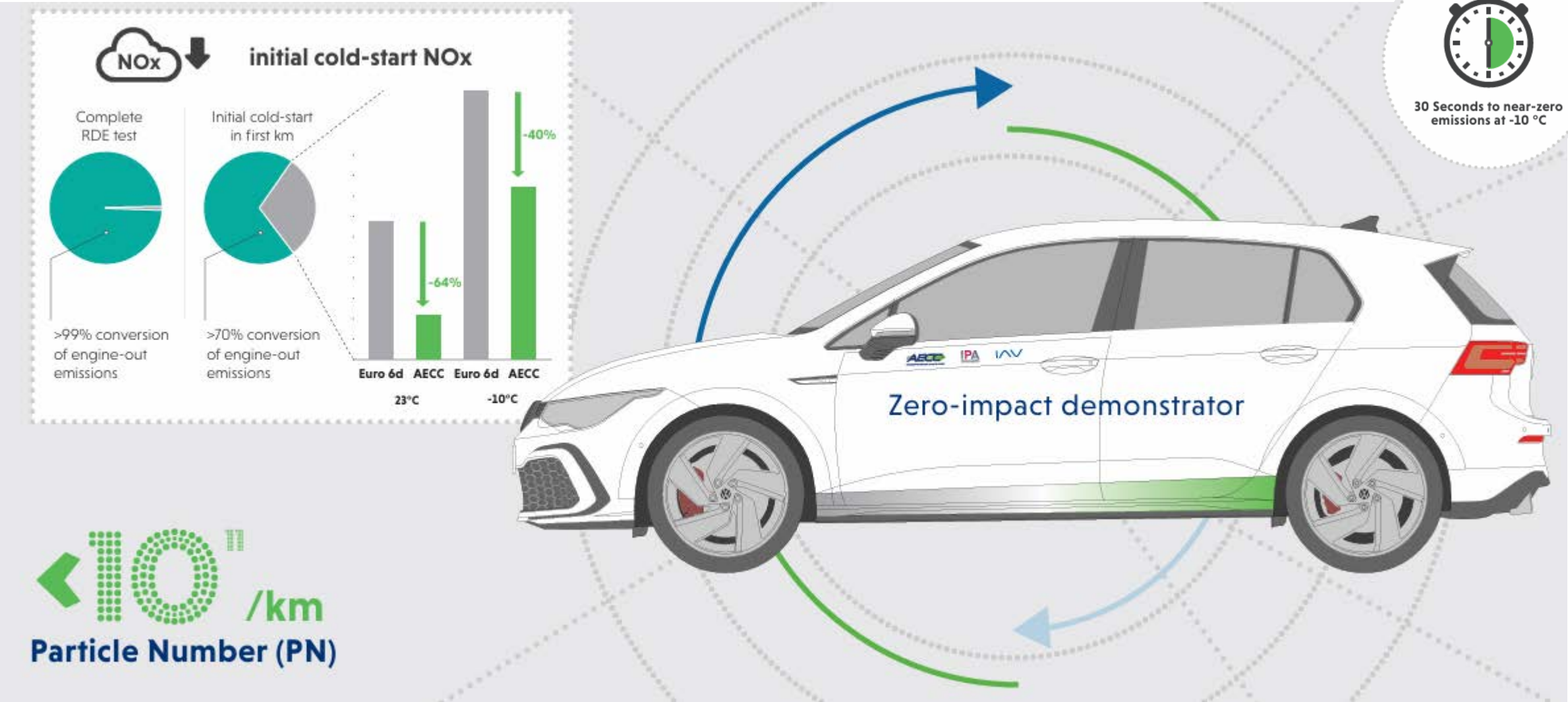
## Heavy Duty Diesel



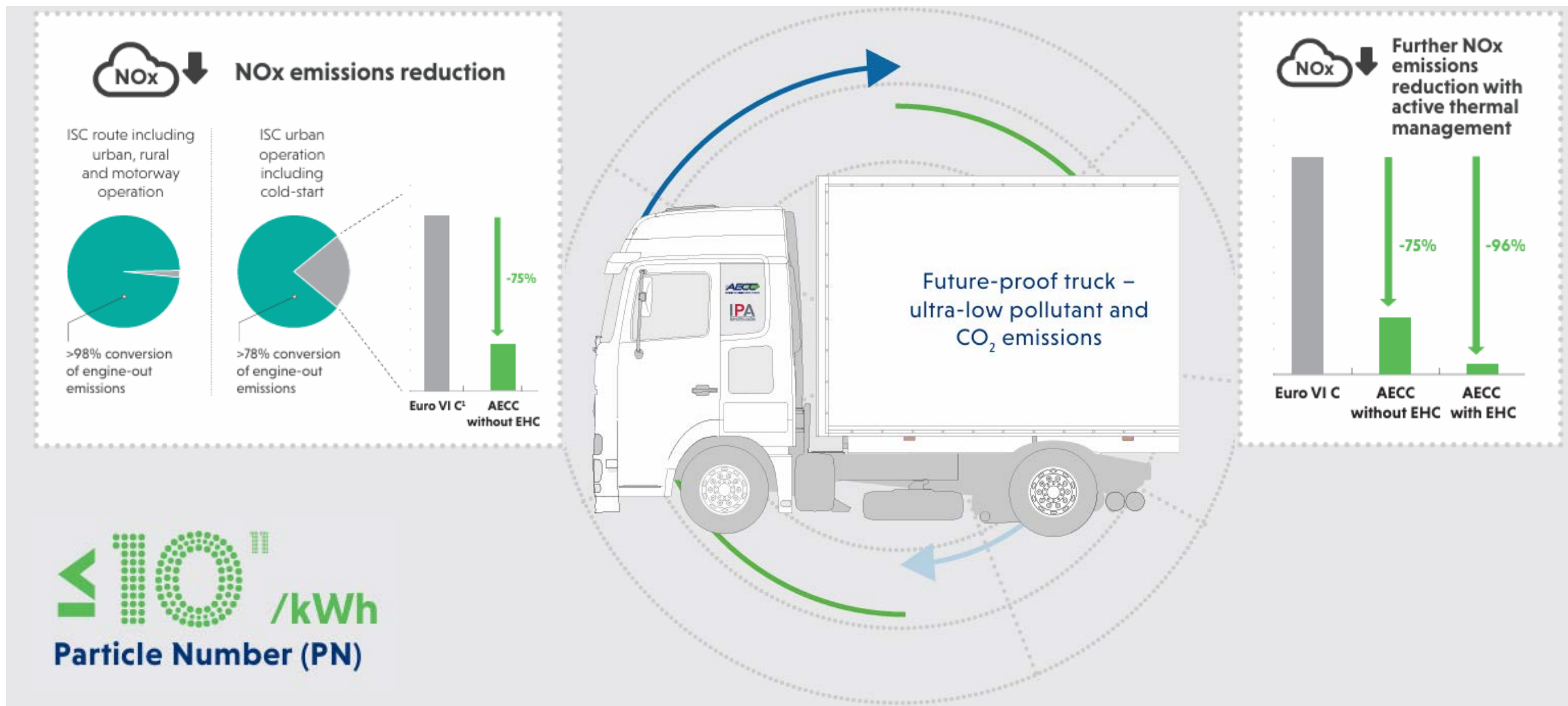
## US 2027 and Euro 7

Dual SCR and close-coupled catalyst/heater

# Technology demonstration shows we can do better!



# Technology demonstration shows we can do better!



# H<sub>2</sub>-ICE equipped with JM catalysts achieve ultra low NO<sub>x</sub> emissions

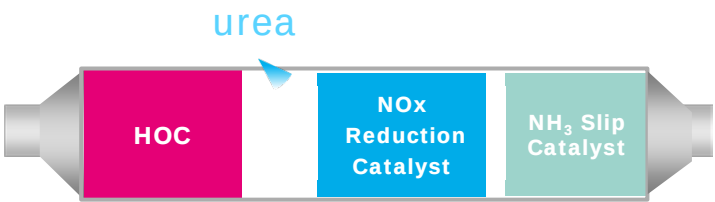
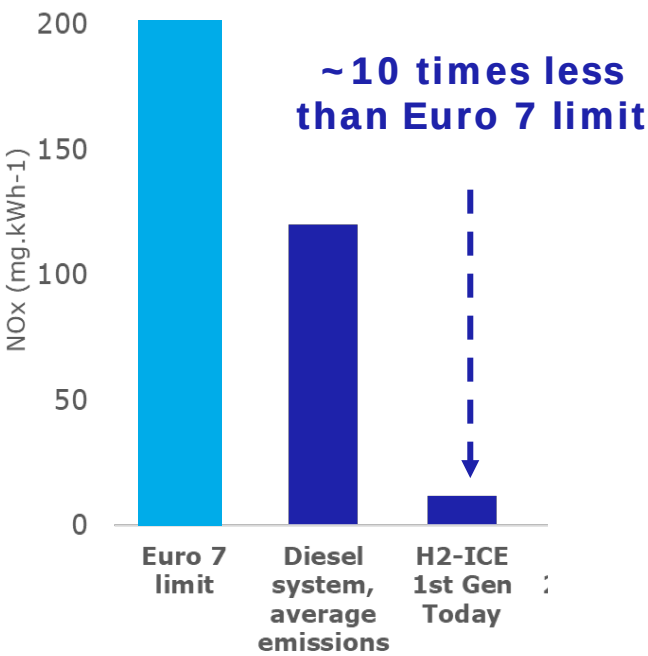
## Project Brunel

Project Brunel is a collaboration of workstreams supported through the UK Advanced Propulsion Centre (APC).

The collaboration aimed at accelerating the development of H<sub>2</sub> fuelled Internal Combustion Engine for the decarbonisation of medium/heavy-duty vehicles.



## Euro 7 HDV target well within reach



# Final thoughts...



- As major global automotive markets look to decarbonise, technology neutrality is becoming more of a pragmatic reality, battery electric accompanied by other solutions.
- The complexity of the vehicle's use case, or job to do can also call for multiple technology choices being necessary.
- As ICE vehicles, hybrids, and renewable fuels remain part of future solutions, we need to consider the available technology for best emissions performance

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