



CREEL CONSULTING LTD
PROGRESSIVE SUPPLY CHAIN MANAGEMENT

Decarbonising Timber Haulage

TimberTransportForum

delivering solutions for a growing UK harvest

- 
- **28 yrs in Timber Logistics**
 - Graduated from UHI in 1994 with an HND
 - The journey has seen some ups and downs & I have >
 - *Been involved with innovative projects*
 - *Dealt with accidents and fatalities*
 - *Seen grown men cry*
 - *Measured sawlogs growing in crops that I planted*



VIDEO

TIME TO WAKE UP

- *The Scottish and UK Governments have set ambitious net zero targets and **successful decarbonisation** of transport will be central to achieving these goals*
- *Transport represents 36% of Scotland's greenhouse gas emissions*
- *. This means shutting off sales of internal combustion engine-powered cars by 2030 and doing the same for light duty vehicles by 2035, and heavy-duty trucks by 2040 (maybe sooner)*

THIS IS A MASSIVE SUBJECT

BRAIN
FRY





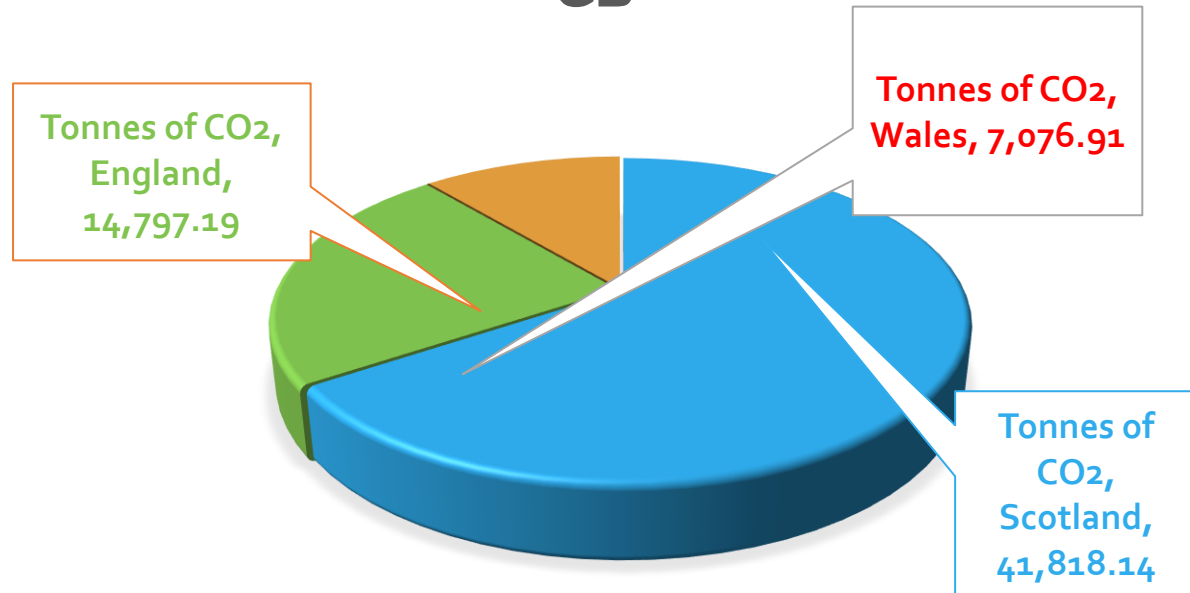
**Scotland's net zero emissions
target date of 2045 is ahead of
many other countries**



- The combined annual CO² output of UK timber haulage by road is 69,552 tonnes.
- Per truck that's around 93.2 tonnes of CO²



TONNES OF CO₂ PRODUCED BY TIMBER HAULAGE IN EACH NATION IN GB



EU truck fleet by fuel type

Petrol
1.30%

Hybrid electric
0.1%

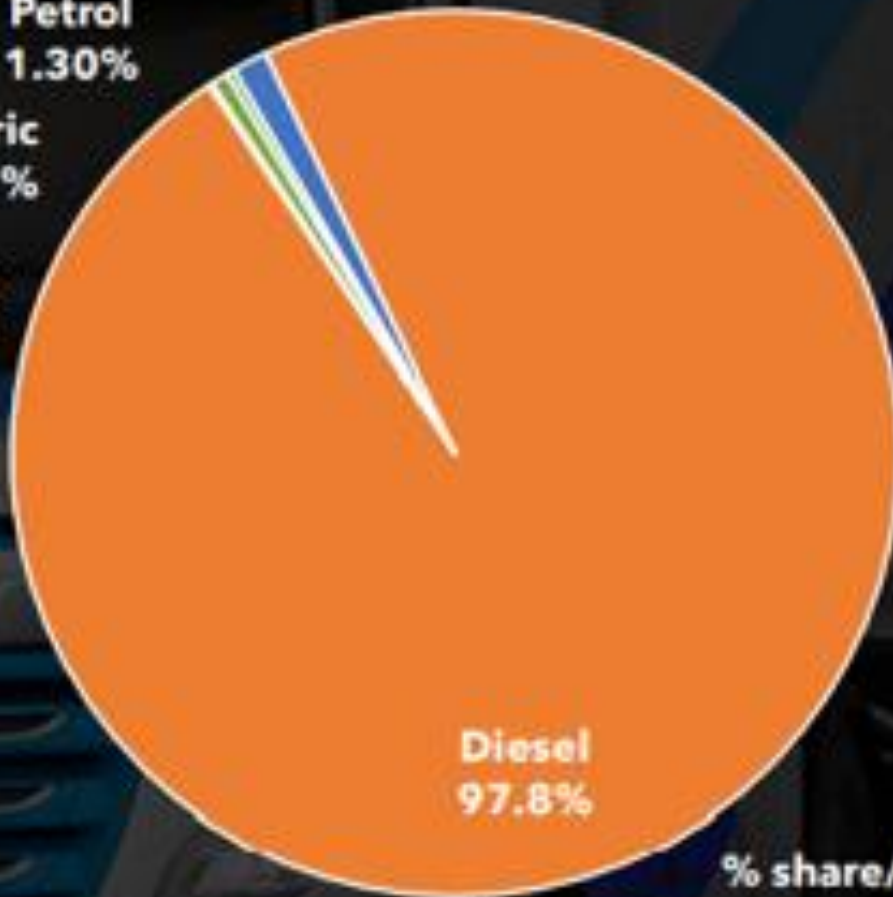
Natural gas
0.6%

Other
0.3%

Electric
0.0%

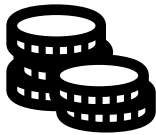
Diesel
97.8%

% share/2019



BARRIERS

- The main barriers to the introduction of zero-emission trucks are



Vehicle cost



Technology readiness



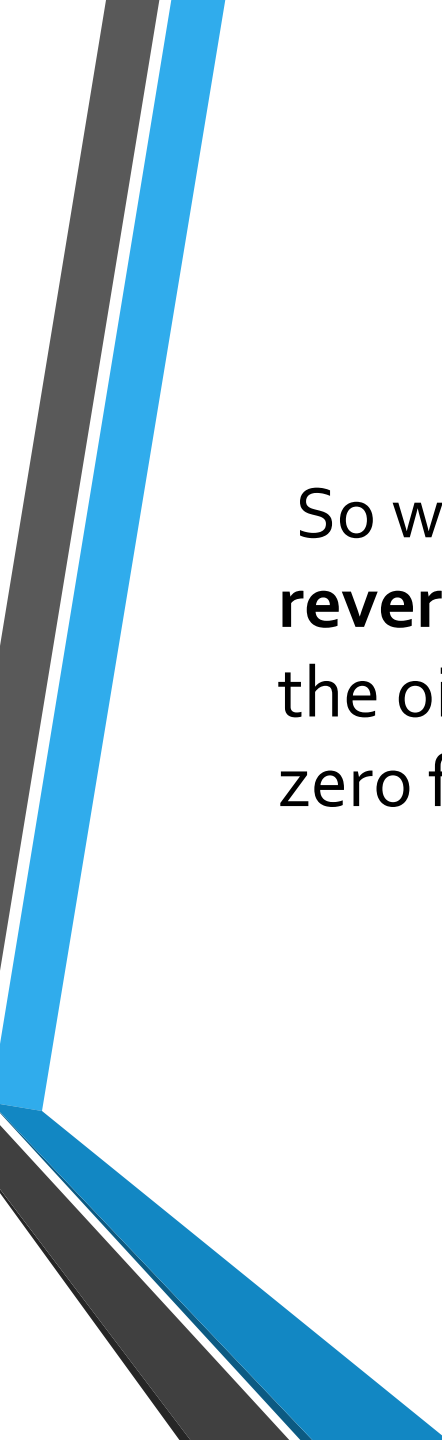
Refuelling infrastructure



Vehicle availability

& PERCEPTION

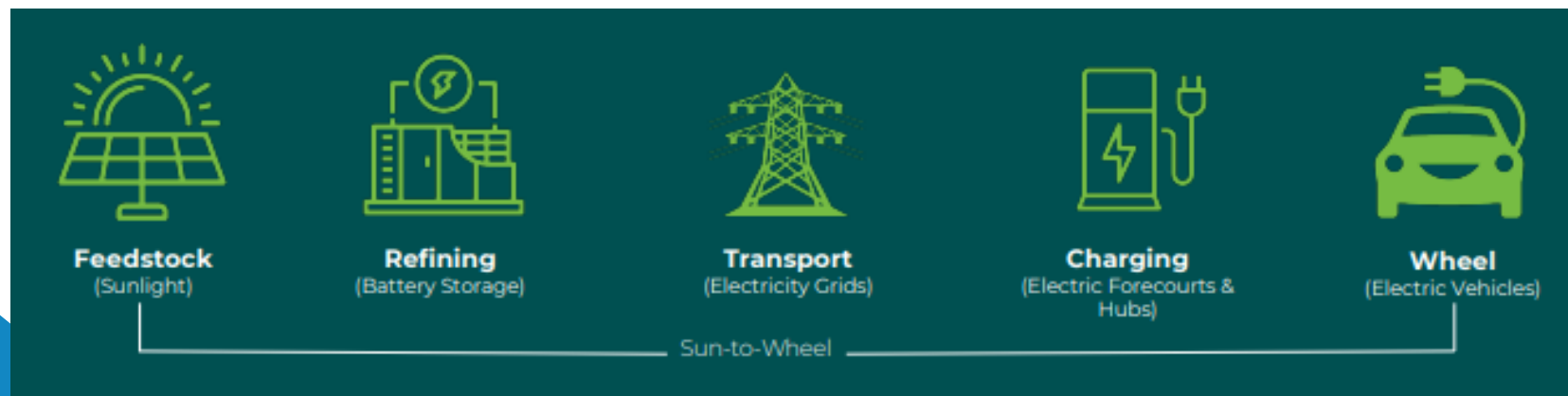
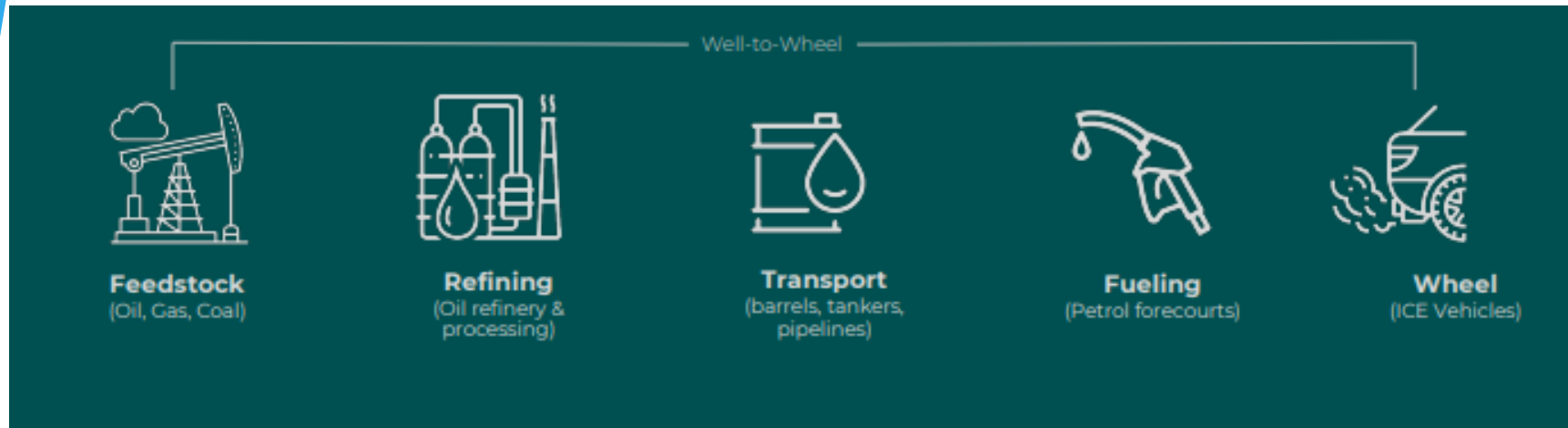




CHANGE

So we also face the challenge of **halting and reversing over 120 years** of development of the oil supply chain and transitioning to net zero fuel supply chains over the **next 15 years**

CHANGE





CURRENT OPTIONS

- **HVO / D+ DIESEL**
- **LNG**
- **BEV**
- **FUEL CELL ELECTRIC
(HYDROGEN)**
- **ICE (HYDROGEN)**

HVO



NITROGEN OXIDES

LOWER NOX NO_x

Levels are reduced by up to 30%

PM PARTICULATE MATTER



PARTICULATE
MATTER

LOWER PARTICULATES

*Particulate, PM25 & PM10 are lowered
by up to 86%*



CARBON DIOXIDE

LOWER CO₂ e LEVELS

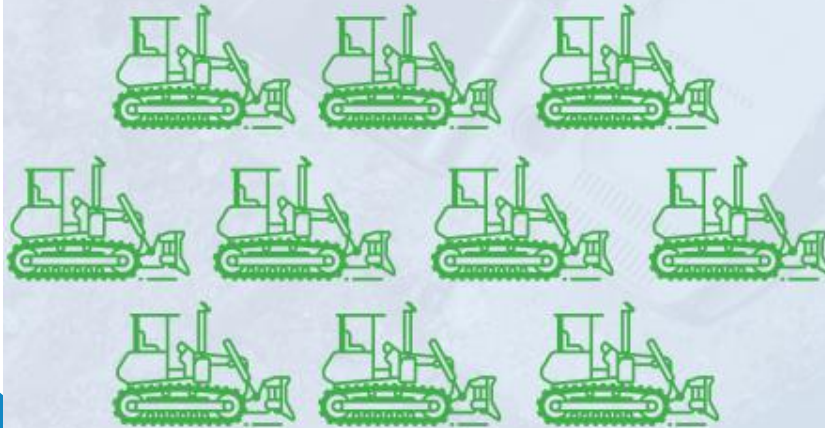
*Green D+ HVO generates up to 90%
fewer greenhouse gases (CO₂ e) and
emissions- reducing your carbon
footprint significantly.*

HVO

1 Diesel machine has the same CO₂e emissions as 10 GREEN D+ machines



VS



PASSENGER CARS (ON-ROAD HVO)



NON-ROAD VEHICLES (OFF-ROAD HVO)



HEAVY DUTY ROAD VEHICLES (ON-ROAD HVO)



HVO

AN TALAMH UAINNE



JOHN DEERE



JST SERVICES
(Scotland) Ltd.

Dynamic • Innovative • Reliable



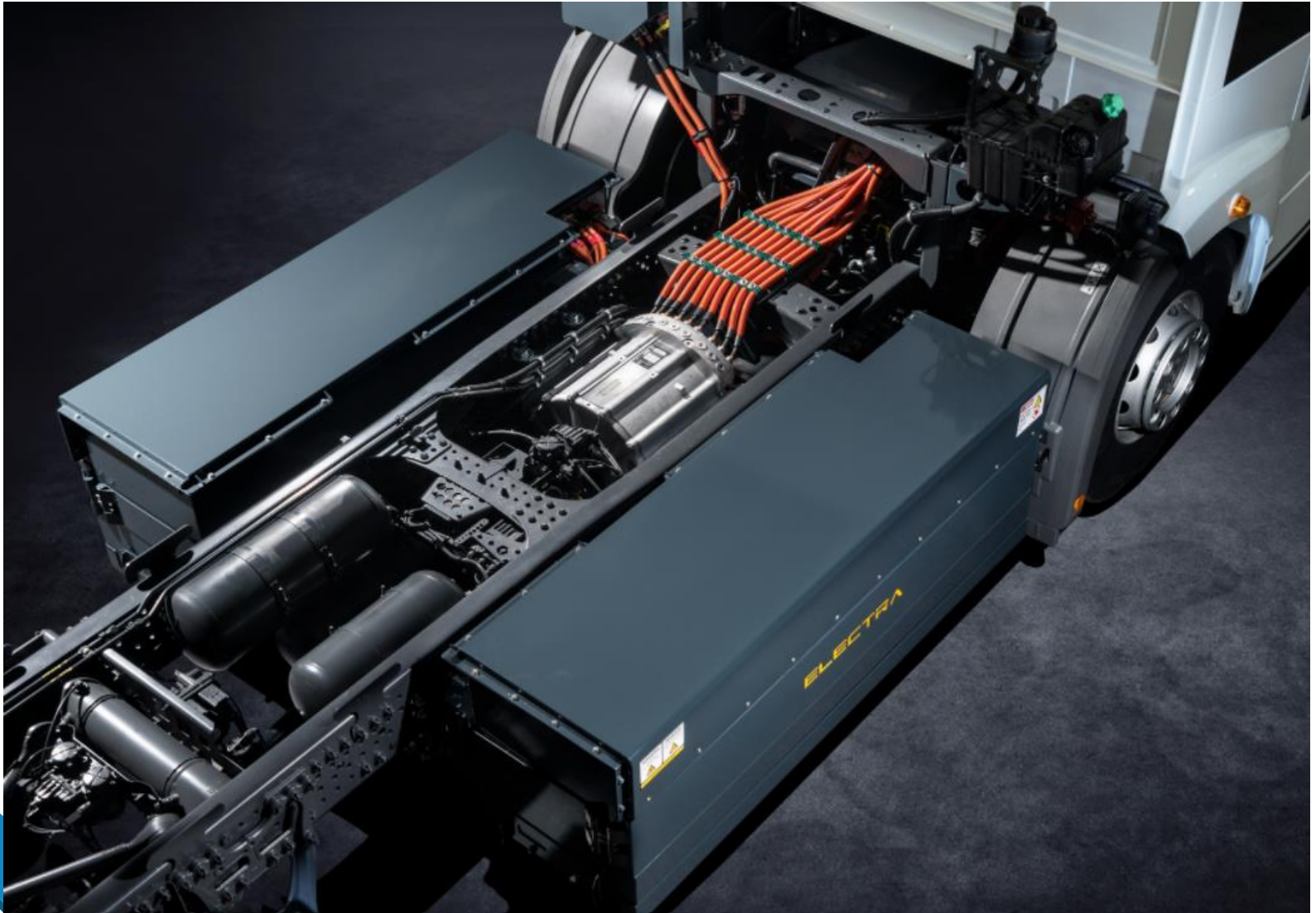
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BATTERY ELECTRIC VEHICLES

BEV



BATTERY ELECTRIC VEHICLES (BEV)



BATTERY ELECTRIC VEHICLES BEV

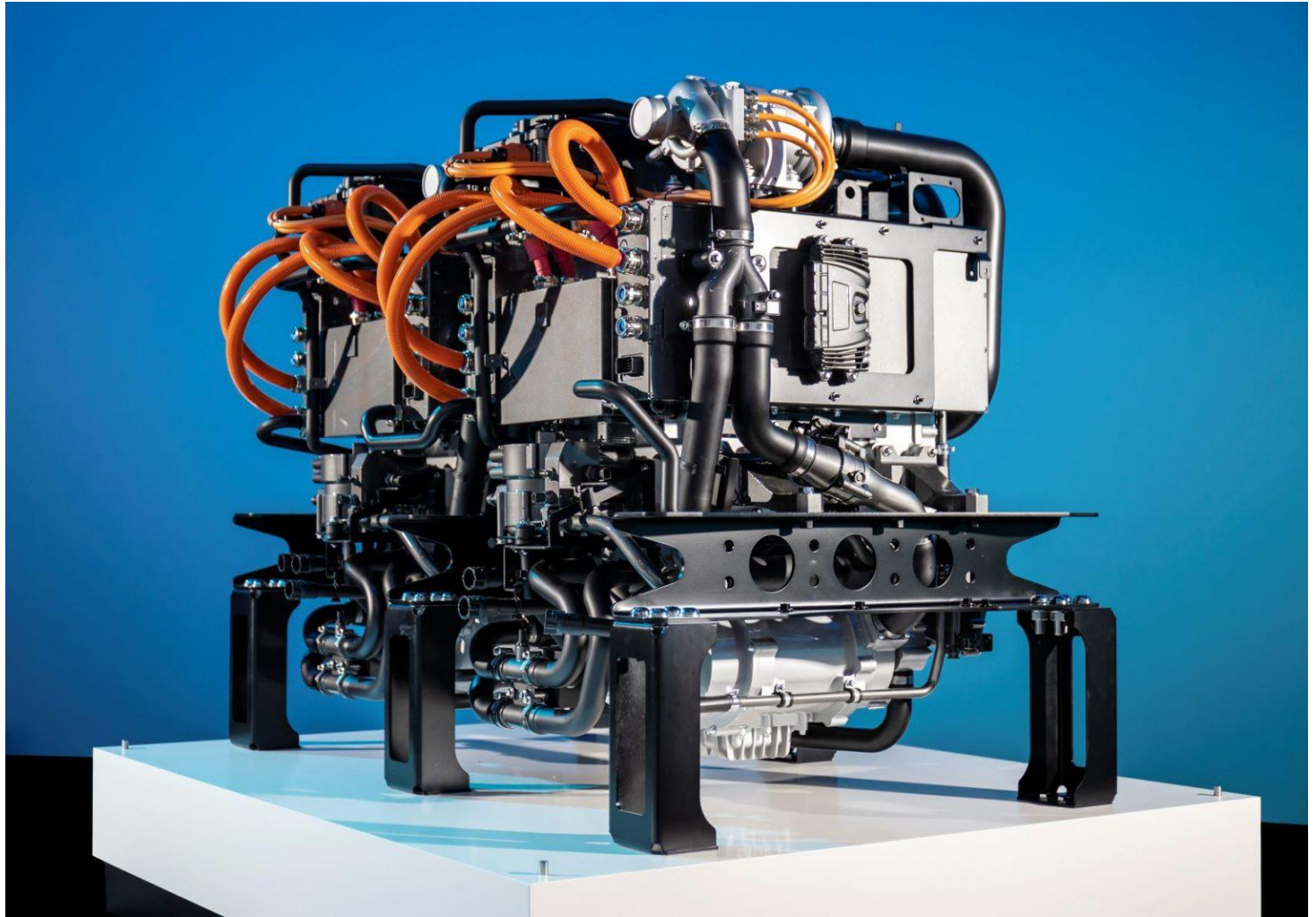
Advantages of **BEV technology** inc

- Zero emission (at the point of use)
- OEM development and support
- Its high efficiency and relatively cheap charging/refuelling infrastructure
 - (although costs can easily spiral out of control where additional electrical infrastructure is required, such as grid connections and substations).

BATTERY ELECTRIC VEHICLES BEV



FUEL CELL ELECTRIC (HYDROGEN)



FUEL CELL ELECTRIC (HYDROGEN)

- Fuel cell electric vehicles (FCEVs) use electricity to power an electric motor. In contrast to other electric vehicles, FCEVs produce electricity using a fuel cell powered by hydrogen, (**energy store**) rather than drawing electricity from only a battery.
- Although some OEMs are aggressively pursuing BE vehicles in favour of FCE, it is generally acknowledged that FCE offers advantages in some transport sectors, particularly the heavy-duty sector.

FUEL CELL ELECTRIC (HYDROGEN)

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- Another **challenge for hydrogen** in the HGV sector is the low density of hydrogen, even when it is pressurised to 350 – 700 bar. This means that packaging enough fuel onboard for a daily duty cycle may start to impact on payloads in terms of volume.....

FUEL CELL ELECTRIC (HYDROGEN)

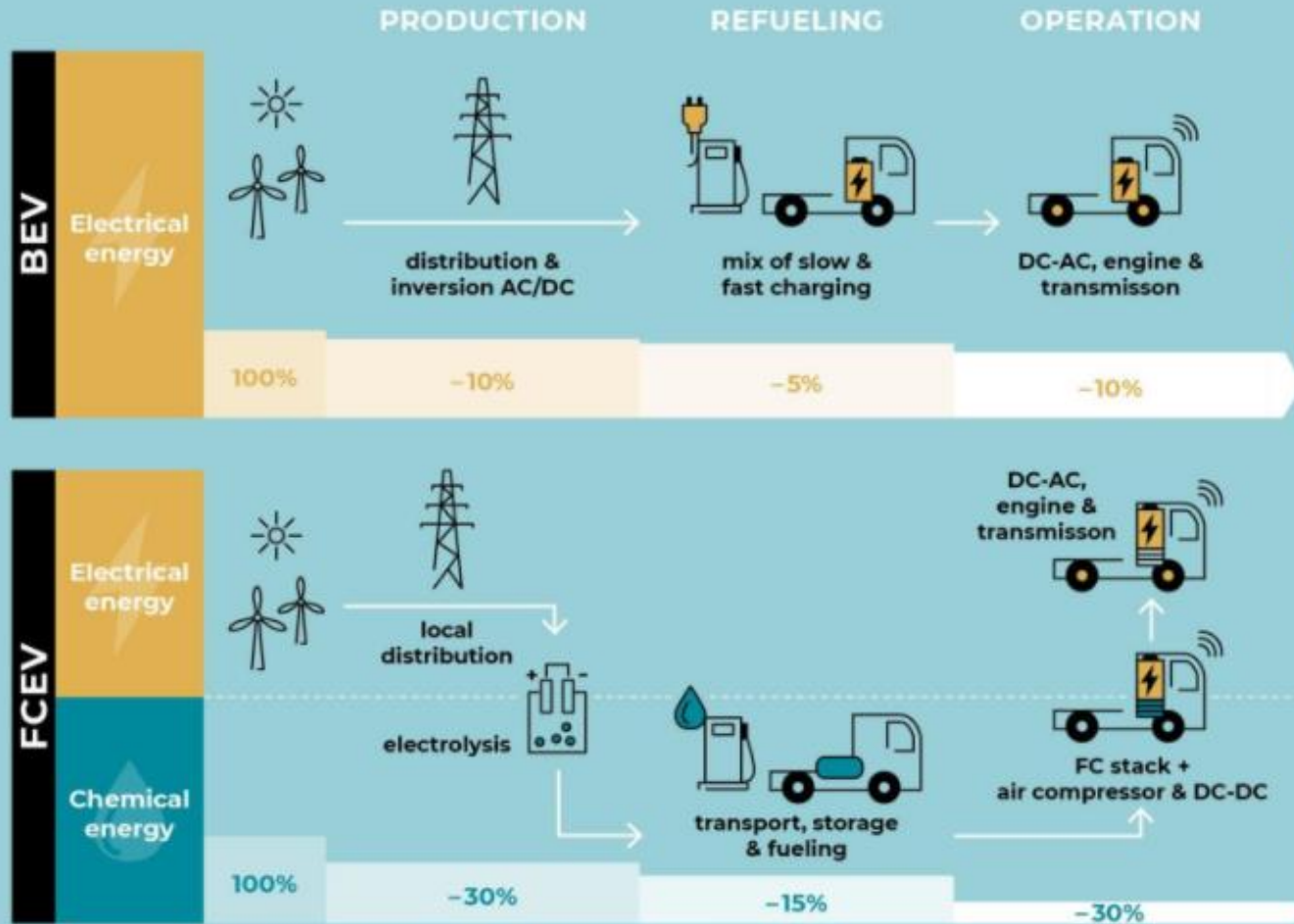
- There is comparatively little spare space on a lorry tractor for the fuel and storing hydrogen on a trailer. This brings challenges with regards to coupling/uncoupling, which may lead to risk of gas leakages.

FUEL CELL ELECTRIC (HYDROGEN)



A comparison of system efficiency between BEVs and FCEVs

TRATON
GROUP



75%
of energy reaches
the wheels

25%
of energy
reaches the
wheels

HYDROGEN ICE



HYDROGEN ICE

- Engines that have been designed/adapted to run on hydrogen and perform similarly to existing diesel internal combustion engines



**ACT
NOW**



NET ZERO²-TIMHAUL

FOSSIL-FREE FUEL HGV TRANSPORT



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**James Jones
& SONS LIMITED**

ELECTRA

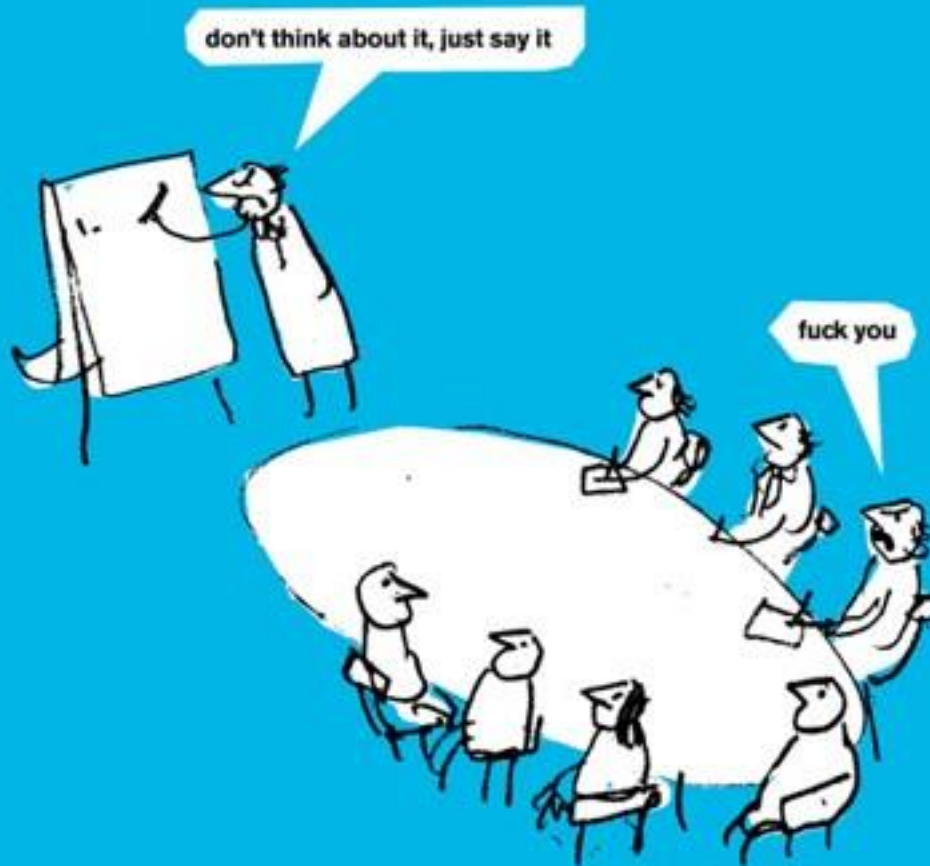
VOLVO
VOLVO GROUP

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ideas meeting



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