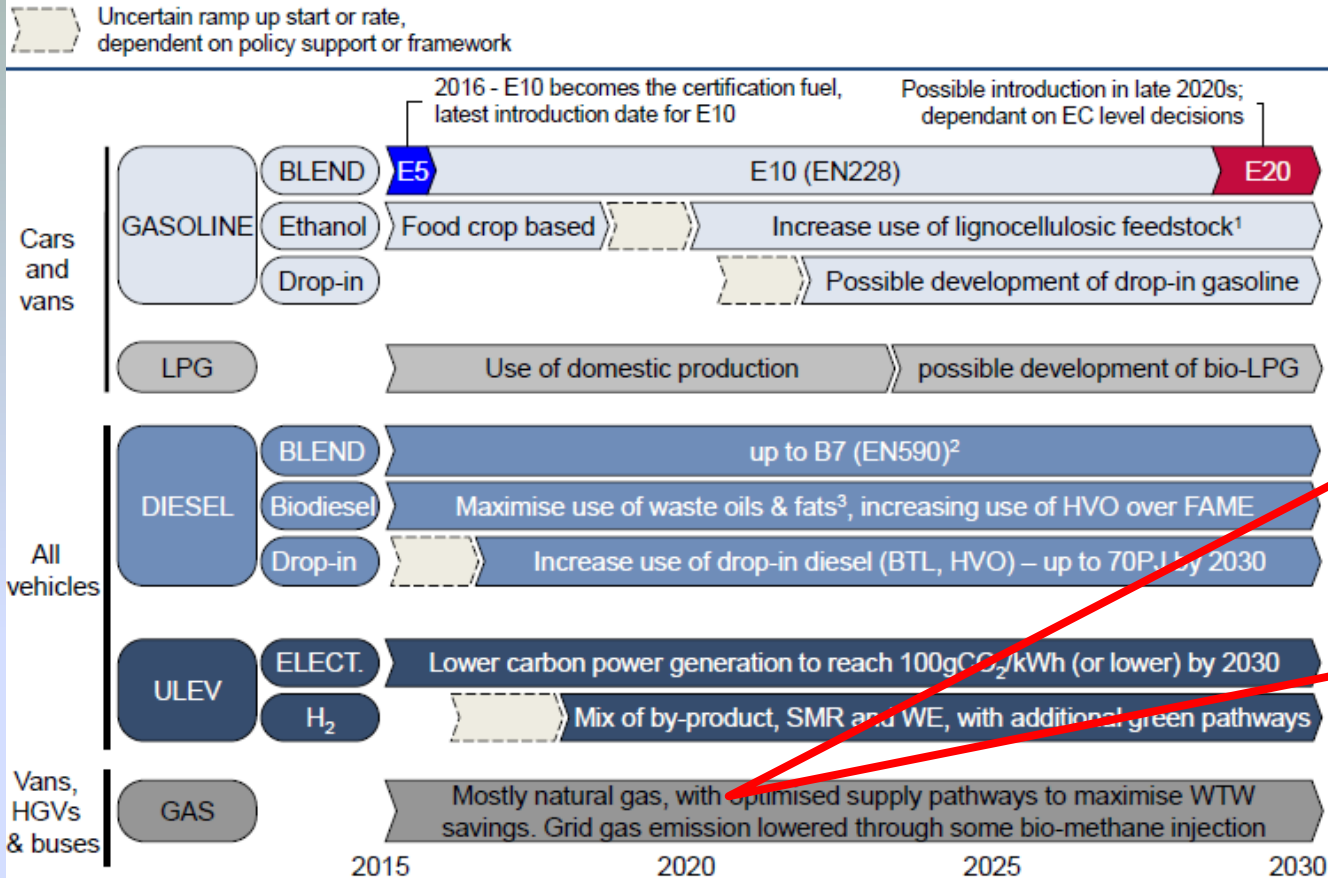


DUAL FUEL & LNG



Government Policy

2015-2030 fuel roadmap: fuel types and blends



SMR: Steam Methane Reforming; ULEV: Ultra Low Emission Vehicles; WE: Water Electrolysis; 1 – Possible development of butanol
 2 – Effective blend likely to stay at B2 for Non Road Mobile Machinery 3 – With measures in place to ensure fuel quality

**LOW CARBON
VEHICLE
PARTNERSHIP**

**STATES GAS IS THE
SOLUTION THROUGH
TO 2030 FOR HGV'S,
BUSES AND VANS**

**HMRC HAVE GIVEN A
10 YEAR
COMMITMENT TO
ROAD DUTY OF
GASES**

Dual Fuel - Overview

- **Substitute a portion of Diesel for Gas**
 - Improving fuel security and reduced reliance on diesel
- **CO2 / Emissions savings**
 - Reduction in air pollutants emissions affecting local air quality
- **Cost Savings (Payback within 2 - 3 Years)**
 - Reduced fuel costs
- **Systems can be retro-fitted**
- **OEM's are developing 100% LNG HGV's**
- **Noise reduction from dedicated gas engines**



How it works.

- Standard diesel engine.
- Engine starts on diesel.
- EMS mapped
- Gas is injected into the engine as well as diesel (by two separate fuel injection systems).
- Gas consumption varies with engine load.
- Diesel is substituted with LPG by up to 25% / LNG up to ~45%.
- If the LPG / LNG system malfunctions the engine will default back to 100% diesel – Dual Fuel



Vehicles.

Retrofitters

Make	Euro	Engine size	HP
DAF XF105/CF85	5	12.9L	410,460
DAF CF75	5	9.2L	310,360
Iveco Stralis	5	10.3L	420
MAN TGX	5	10.5L	440
MAN TGX	5	12.4L	480
Mercedes Actros	5	11.9L	408,435
Mercedes Axor	5	12L	428
Renault Premium	5	10.8L	460
Volvo D13C	5	12.8L	460
Mercedes New Actros			
OM471	5	12.8L	450
Scania	5	13L	440
Iveco Stralis Euro6	6	11.1L	460
Mercedes Actros	6	12.8L	450
Mercedes Actros	6	10.7L	450
DAF XF	6	12.8L	450

OEM's

There is a number of OEM's developing Dedicated Gas Trucks (LNG) Euro 6, these include:

- Scania
- Volvo
- Iveco

Warranties / Servicing.

- *OEMs do produce factory fitted units.*
- *Retro units are backed by an OEM letter confirming what the warranty covers post refit.*
- *Retro fitters provide a warranty for the remainder*
- *Servicing provisions are advised and can be trained to local dealer.*

The Fuels.

LPG (LIQUIFIED PETROLEUM GAS)

- Cleanest burning fossil fuel
- Globally produced and traded
- Can be imported or sourced from UK
- Heavier than air
- 6% less Carbon reduction
- Stored under pressure as a liquid
- Priced in litres

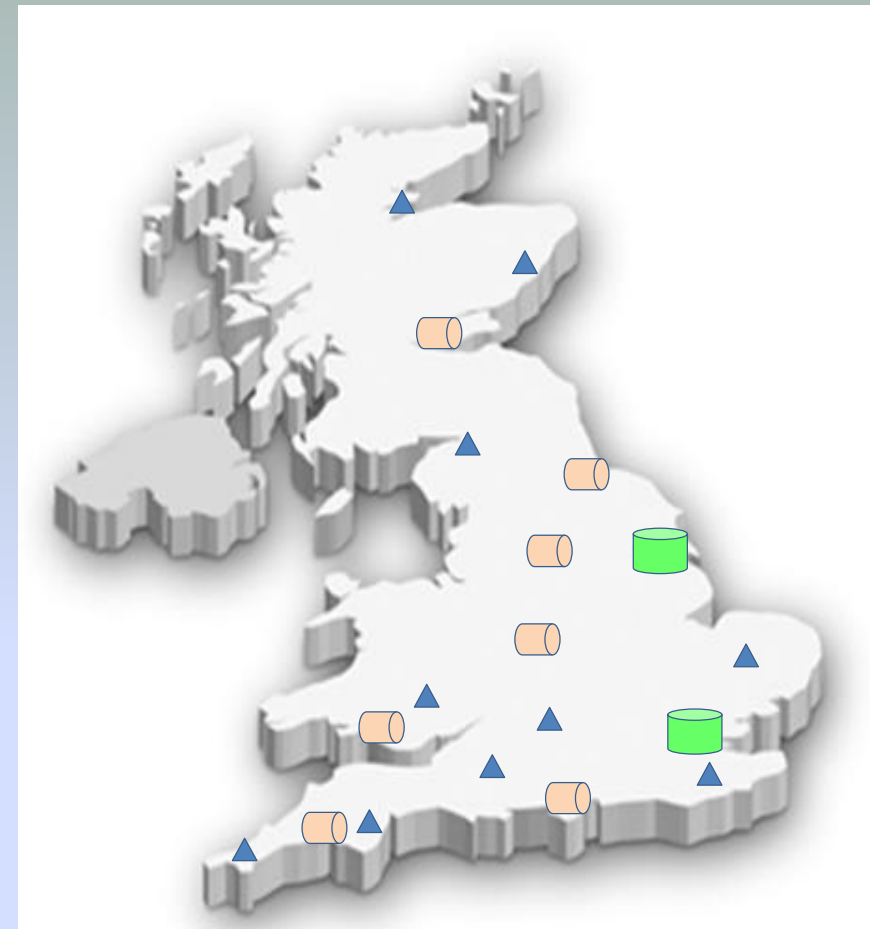
LNG (LIQUIFIED PETROLEUM GAS)

- Colourless, Odourless
- Cryogenic Fuel (-162°C)
- Lighter than air at ambient temperatures
- LNG covers up to 20% of UKs main gas requirements
- 12% less Carbon reduction
- Priced in tonnes

Calor Overview – LPG Supplies

✓ **Strong operational infrastructure**

- **Dedicated LPG terminals**
- **Supply positions with all UK refineries**
- **LPG Storage Caverns**
- **24/7 in house trunking division**
- **Largest LPG distributor in UK**
- **Operators of 7 Top Tier COMAH sites**



Calor Overview – LNG Supplies

✓ Strong LNG supply position in Northwest Europe



Refuelling – back to base



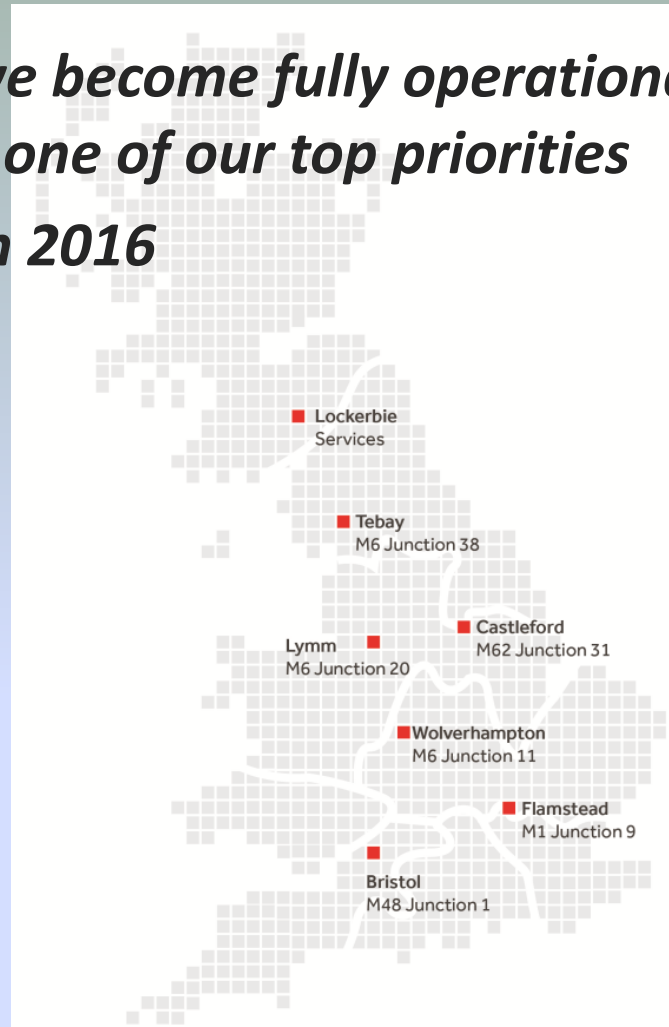
LPG INSTALLATION



LNG INSTALLATION

LNG - Refuelling Options

- ✓ *7 public stations have become fully operational since April and further expansion is one of our top priorities*
- ✓ *2 new sites on line in 2016*



LNG UK Market Development

- ***Supply of LNG to the UK***
 - *Isle of Grain opening 11/11/2015, improves UK supply of LNG*
- ***Infrastructure has developed***
 - *Over 20 LNG and 10 CNG stations nationwide*
- ***Vehicle solutions***
 - *From 1 or 2 solutions to a number of OEM and retrofitters in the market*
- ***Refuelling systems***
 - *Technology developments have made these easy to use, incorporating into Triscan systems to vent recovery*
- ***Government support***
 - *Fuel Differential set until 2024 at £247/tonne*
- ***Many companies have adopted LNG into their fleets***

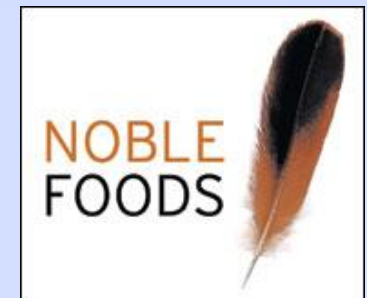
Companies who are using Gas



Waitrose



DEBENHAMS





Thank you for your attention