



Step 2 – Explore alternative fuels and technology types b) heavy duty vehicles



1.3: ALTERNATIVE FUELED BUSES AND HEAVY VEHICLES



ALTERNATIVE FUELED BUSES AND HEAVY VEHICLES

- Euro standards are type approved for an engine rather than a vehicle.

Technology	Bus	Truck
Gas	✓	✓
Biofuel	✓	✓
Hybrid	✓	✓
Plug in hybrid	Trials	Trials
Electric	✓	✓
Hydrogen	Trials	Trials



GENERAL RULES FOR HYBRID HDVS

- The operator will notice little difference between this and a diesel vehicle.
- They are only suited to stop start conditions, such as urban bus routes and refuse collection
- There are emissions savings of more than 30% for the latest hybrid buses compared to diesel buses
- These can fit seamlessly into an existing diesel fleet
- They play a prominent role in many fleets across Europe, such as the Barcelona and London bus fleets
- They are less common in trucks, some refuse collection vehicles available
- At present they are more expensive to run than conventional vehicles. Approximately 50% higher capital costs with a payback period in excess of 15 years.



GENERAL RULES FOR GAS AND BIOFUELED HDVS

- These vehicles are similar to a conventional ICE vehicle but use alternative combustible material, sometime as a diesel hybrid
- Biofuels come from various renewable sources, including crops and waste.
- Gas is the same as domestic gas and it is either liquefied (LNG) or compressed (CNG). Gas can also come from renewable sources (biogas)
- As many heavy vehicles have dedicated refuelling infrastructure, for example at bus depots, using this technology can work well
- There are various sources for biofuels which need to be considered by the procurer
- Gas and biofuel supply is well developed in many parts of Europe, for example Sweden.
- CO₂ and air quality associated emission savings vary depending on technology. They are lower and sometimes close to zero.



GENERAL RULES FOR ELECTRIC HDVS

- You build the charging infrastructure around the bus route
- There are some examples of buses being used operationally, including in China and Nottingham, UK
- There are few examples of electric trucks being used commercially
- There are two charging methods for buses: fast charging and slow charging and three general regimes for charging.
- CO₂ is generally reduced (depending on energy production method)
PM and NO_x are zero from the bus.
- The vehicles are more expensive to purchase, but often cheaper over the lifetime due reduced running costs



GENERAL RULES FOR PLUG IN HYBRID HDVS

- The vehicles run like an electric bus, but have an on board diesel engine or generator
- This allows for the use of electric buses but without the range limitations
- Suited to vehicles which run tough duty cycles, such as city centre buses
- This technology is in its infancy in buses, there are some trials taking place, including London and Stockholm
- The electric element of the vehicle can be geofenced. So the vehicle has zero tailpipe emissions when going through areas of poor air quality.



GENERAL RULES FOR HYDROGEN HDVS

- It is unlikely that you will be involved with an hydrogen vehicle
- They will not be cost effective until at least 2020
- There will be more EU funded large scale trials taking place in the next few years.



ACTIVITY 2

- Tell me about a bus route in your town?



[A modern Ashok Leyland BEST double Decker bus](#) [CC BY 3.0 br](#)