

Transport: Heavy Vehicles - Biofuel

This lever controls the sub-levers listed in the table, and ambition levels are for the end year shown on the right-hand side.

Biofuels have the potential to reduce greenhouse gas (GHG) emissions as the CO2 produced at the tail pipe has been absorbed during the growth of the biomass used. The net GHG emissions impact of biofuel is therefore generally low being just those incurred in the supply chain, although for some crops (such as oil seeds) the impact can be much higher, hence the interest in biofuel production from wastes such as used cooking oil.

In 2018 the share of biofuel consumed by road vehicles was 4.8% for bioethanol and 3.9% for biodiesel. At low levels, they can simply be mixed with fossil fuels and used in existing engine technologies. However, shares of the fuel mix beyond 10% for bioethanol and 7% for biodiesel require modifications to the engine or the development of advanced biofuels. The biofuel share in UK rail and shipping in 2015 was negligible and is limited by similar factors as in the road vehicle biofuel share, although many experts think that shipping is more likely to be decarbonised using ammonia produced from low carbon hydrogen, than using biofuel.

Key Interaction

Increasing the use of biofuels in transport has implications for how that increased demand for biofuels will be satisfied. Biofuels can be created from waste and biomass grown in the

UK, but feedstocks can equally be imported from a wide range of countries around the world. There are however limits to how much of these feedstocks are sustainably available both domestically and globally. UK bioenergy production can be controlled through the Land Use & Biofuels levers.

Level 1

Efforts to increase the amount of biofuel blended with fossil fuels are abandoned and the blend remains close to current levels.

Level 2

Biofuel blend increases to match the current levels seen in more 'biofuel progressive' countries such as Brazil where the ethanol use mandate for gasoline was raised to 27% in 2015 (though many buses would require biodiesel). This might require engine modifications depending on the type of biofuel.

Level 3

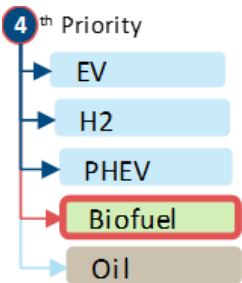
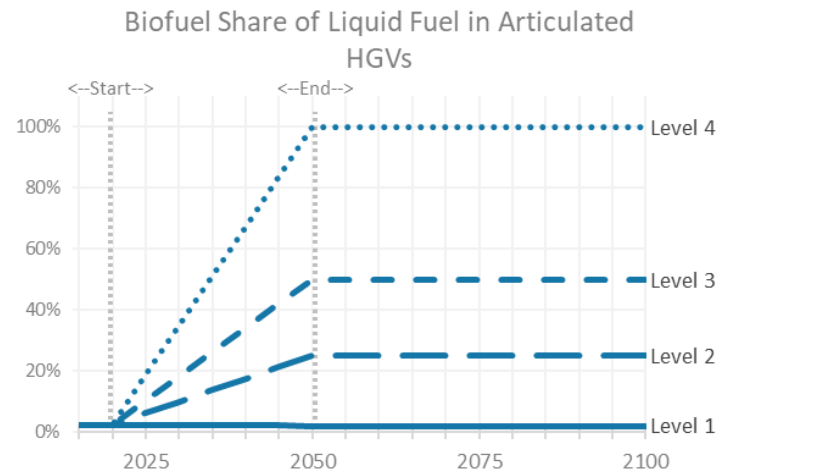
Technological advances in biofuels improve their compatibility with current vehicles allowing 50% of fossil fuel to be substituted.

Level 4

Huge advances in biofuels with strong public engagement and policy leading to all fossil fuels used in heavy vehicles being replaced by biofuels. Unless transport demand is reduced, this would require two thirds of the maximum available raw biomass of around 300 TWh/year (CCC 'Global governance and innovation' scenario).

Default Timing Start year: 2020, End year: 2050
Biofuel share of liquid fuel by vehicle:

Sub-Lever	Units	2015	Level 1	Level 2	Level 3	Level 4
HGV Articulated	share	2%	2%	25%	50%	100%
Bus	share	2%	2%	25%	50%	100%
Rail Passenger	share	0%	2%	25%	50%	100%
Rail Freight	share	0%	2%	25%	50%	100%
Non-Road Mobile Machinery	share	0%	2%	25%	50%	100%
Shipping Domestic	share	0%	0%	10%	30%	100%
Shipping International	share	0%	0%	10%	30%	100%



Lever Priority

Biofuel is the fourth in the priority order for heavy vehicles.

Where supply would otherwise exceed demand, measures lower in the priority order will be superseded by those above them. Conventional fossil fuelled vehicles meet any shortfall in demand.