

# Road fuels of the future

For more than 100 years the internal combustion engine has dominated propulsion for road-going vehicles. Reliant on non-renewable fossil fuels, gasoline and diesel, it's future in its current guise appears limited. As governments around the world search for ways to reduce greenhouse gas emissions, there are a number of possible alternative fuels emerging for road transportation.



## Biofuels

Biofuels are produced using organic matter or waste materials. They are the largest source of renewable energy in use today, as they are relatively energy dense and easy to distribute through current infrastructure. They will play an important role in helping to decarbonise transportation sectors in the medium term.



## Electrification

Electric vehicles produce zero emissions. Advancements in battery technology has resulted in growing demand, but limited range, high cost and restricted infrastructure currently prevent large scale uptake. EV's are widely seen as the future of road transportation, particularly as governments look to ban production of internal combustion engines.



## E-fuels (hydrogen)

E-fuels are fuels that are synthesised using electrical power, including liquid and gaseous fuels such as hydrogen, gasoline, diesel and kerosene. Classified as climate-neutral when based on renewable energy, they could replace conventional oil-based fuel while using existing infrastructure.



## LNG

Liquefied natural gas is better suited than CNG for transport applications where energy density is crucial, such as road freight, where it produces far lower emissions than diesel but offers similar vehicle range. But it requires expensive purpose-built vehicles and storage infrastructure, which limits its attractiveness outside heavy-duty trucking.



## CNG

Natural gas is the cleanest burning fossil fuel, and compressed natural gas is already widely used as vehicle fuel in a few countries. Gasoline vehicles can be cheaply retrofitted to become dual-fuel with the option to run on CNG, and some CNG-ready vehicles are being manufactured. However, filling infrastructure remains limited in many countries.



## LPG

LPG can be used as fuel for a variety of purposes and is widely used in homes and business, but its use in road transport is minimal. However, it has long been recognised as a low-emission alternative to gasoline and diesel. Vehicles need to be retrofitted with an LPG conversion and filling stations remain limited.