THE FUTURE OF ROAD TRANSPORT: TRANSITIONING TO CLEANER ALTERNATIVES

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In the short-term, the focus will be on maximizing efficiency and implementing cleaner technologies.

In that respect, low-carbon fuels, including renewables and e-fuels, can leverage on current engine technologies, and can be combined with future hybrid solutions.[1]

For long-haul vehicles, Liquified Natural Gas (LNG) is currently considered one of the most viable technologies.[2]

Biofuels, such as biomethane, also offer a short-term solution which is increasingly being looked at by fleet owners. An example of that is UK's supermarket and department store chain owner John Lewis Partnership, which announced it is going to switch its fleet to biomethane from 2028.[3]

Measures that are aimed at increasing efficiency are also key in the short-term, such as reducing empty and under-utilized miles.

In addition, the use of premium lubricant solutions can help maximize returns from high-tech equipment, easing up-front cost concerns, reducing downtime and maximizing efficiency.[4]

Digitization also presents opportunities for fleet owners to increase efficiency while decreasing costs. Digital fuel management systems allow fleet managers to track fuel consumption and driving behavior in real time. Telematics software tools such as Shell Telematics offer solutions including dashboard reports for fuel consumption and idling, which allow fleet managers to compare progress month-by-month and track total mileage driven and CO_2 emissions. They also track tire inflation which supports fuel efficiency and offer additional services such as monitoring for electric vehicles (EV).

On the other hand, while electric vehicle growth has surged in recent years in the passenger vehicle segment, battery vehicle usage in long-haul commercial transport is limited due to uncertainty around the refueling network. This includes a lack of sufficient charging stations and range anxiety, the distance that a vehicle can cover without refueling.

Overall, the lack of an appropriate refueling infrastructure and doubts over the ease of infrastructure replacement are seen by the industry as major obstacles to the full development of cleaner transport alternatives for heavy duty vehicles, with as many as 80% of participants in an industry survey citing this as a key challenge.[5]

Deployment of fuel cell electric vehicles (FCEVs) and battery electric vehicles (BEVs) in commercial operations, as well as battery charging and hydrogen fuel cell infrastructure development are expected by the mid-2020s.

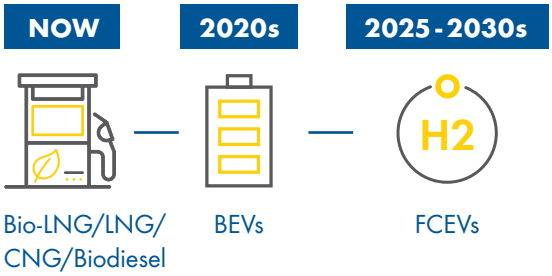
Low- and zero-emission trucks will get close to cost parity with diesel and will start entering the fleet at scale by the late 2020s as infrastructure providers and original equipment manufacturer (OEMs) scale up production.

PROMOTING CLEANER ALTERNATIVES

The future of road transport will revolve around these technologies:

- **LNG/bio-LNG vehicles** – Using liquefied natural gas (LNG) or bio-LNG
- **CNG** – Using compressed natural gas, particularly suitable for urban applications
- **BEVs** – Battery electric vehicles
- **FCEVs** – Fuel cell vehicles, which produce electricity using a fuel cell powered by hydrogen

A TIMELINE TO DECARBONIZATION



Battery electric vehicles (BEV) are expected to enter the MDT and HDT segment by the mid-2020s, starting from urban areas, particularly those with ultra low-emission zones.[6]

The technology will expand into longer-range applications as battery technology matures, possibly reaching around 30 to 40% of new truck sales in the mid-2030s.[7]

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Fuel cell electric vehicles (FCEVs) are expected to become viable for commercial applications around 2025. The transition will likely start in clusters and corridors that are close to large-scale renewable-electricity generation sites, such as North Sea offshore wind parks, or in countries where hydrogen is central to the national energy strategy, such as China and Japan.

FCEV adoption is then set to increase towards 2030, as production of green hydrogen picks up.[8]

Nonetheless, internal combustion engine (ICE) vehicles will likely continue to play a role in remote areas which might lag behind in the development of BEV and FCEV infrastructure. In those instances, biofuels and LNG are expected to have a central role.

For now, liquefied natural gas (LNG), and compressed natural gas (CNG), along with their renewable alternatives (bio-LNG, bio-CNG, and biodiesel) provide a viable solution for decarbonizing the on-highway fleet industry.

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FAQS

How does a synthetic lubricant reduce emissions?

High performance lubricants can help reduce emissions by extending hardware lifetime and reducing friction, which lead to lower fuel consumption. Lubricants that are carbon-neutral throughout their lifecycle also contribute to reducing overall carbon emissions.

What is the difference between BEVs and FCEVs?

While BEVs rely on a battery to power the vehicle, FCEVs are powered by a fuel cell that runs on hydrogen. With countries around the world increasingly committed to developing a hydrogen economy, FCEVs are gaining traction as a viable, and potentially cheaper zero-emissions vehicle technology.[9]

What are the different types of hydrogen?

Hydrogen can be produced from natural gas through methane reforming. This type of hydrogen is referred to as 'grey hydrogen'. However, the CO_2 can be captured and stored, leading to a lower-pollution type of hydrogen, so-called 'blue hydrogen'.

The hydrogen can also be produced by splitting water by electrolysis, with no negative impact on the atmosphere ('green hydrogen').[10]

DID YOU KNOW?

1) The road freight sector accounts for 3 million companies worldwide, operating about 217 million vehicles.[11]

2) To meet the targets set out in the Paris Agreement, absolute emissions from road freight will need to decline almost 60% by 2050, despite a possible doubling of transport volume over the same period.[12]

3) Some industry executives estimate up to a third of all trucks they plan to sell in 10 to 15 years will have alternative drivetrains.[13]

4) China is leading the way in the road freight decarbonization agenda, investing heavily in hydrogen technology development for heavy trucks.[14]

5) Feeding a CNG vehicle with biomethane produced from municipal waste and/or with synthetic gas, leads to the same low amount of emissions as a BEV under the assumption that wind/solar electricity is used.[15]

6) In the US, 85% of NGVs registered in the US today are in heavy-duty applications, specifically urban goods movement, refuse, and public transit.[16]

7) US Utilities have committed more than $1 billion to support EV infrastructure for fleets by 2025.[17]

8) Hydrogen refueling times can be comparable to diesel for many heavy-duty applications including buses and short haul trucks.[18]

9) Through combinations of OEM and fleet efforts, average heavy-duty vehicle efficiency is significantly improving and individual Class 8 tractors are achieving as much as 10 miles per gallon (MPG) in real-world use.[19]

10) California's renewable diesel consumption nearly tripled between 2015-2019 to 620 million gallons.[20]

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