

# FUTURE FUELS AND FUTURE STORAGE

Channoil's Mark Waddington looks at the energy transition, demand developments and their impact on the storage sector in Europe



➤ **THE WORLD** is on a pathway to the most significant energy transition since the emergence of fossil fuels as a major global energy source. The evidence for climate change is no longer under serious dispute, the major question now, is how quickly the mitigating actions need to take place.

There will be a repositioning in the tank storage sector and there will be localised casualties. Increasingly, investment is going to be driven by the requirements to be sustainable and green. The effects – driven by evolving demand – are expected to be highly regional, and this will determine storage demand.

We anticipate an important phase for the tank storage sector as the decarbonisation journey accelerates but with a regional imbalance in the growth trends. Clearly, demand for conventional fossil fuels will decline, but at what pace? And what alternatives will the storage sector have for maintaining revenues?

## ROAD TRANSPORT FUEL

The latest round of EU legislation attempts to make room for a range of fuel and energy solutions. There is a strong incentive for electric vehicles (EVs) over gasoline and diesel vehicles, but growth of biofuels also continues to be encouraged. Legislators are taking what they call a 'ratcheting' approach, whereby the mandates are increased stepwise as new

technologies emerge, which in turn make it easier to hit higher targets.

Gasoline consumption will continue to fall in advanced economies as the passenger car fleet turns to battery power. Passenger road transport applications are among the easiest to electrify, and the rapid growth of EV sales is expected to continue.

We recently examined transport fuel demand evolution in Germany to 2030 and beyond. We saw that a trebling of EVs in the passenger vehicle fleet from around 5 million to 15 million brought about a 15% decline in fossil gasoline demand by 2030. This may well be a conservative estimate, as nearly 700,000 new EVs were registered in Germany in 2021 alone. However, these levels of EV registration are sufficient for Germany to hit their stated 25% greenhouse gas (GHG) reduction target by 2030. What we conclude from this is that further increases in the targets will be brought in as soon as they look achievable, which will depress gasoline and diesel demand further. Additionally, biofuels mandates are increasing and there is a shift away from crop-based fuels to non-crop sources.

And this is only the picture to 2030. The decline in conventional fossil fuel demand beyond 2030 can be expected to steepen. And the EU as a trade bloc is not alone in increasing its targets.

Passenger diesel car demand is already on a downward trend, although this is compensated by truck and bus diesel demand, in the short term. Hydrogen refuelling stations are already being built for power trains based on fuel cell technology. Today, such the hydrogen available is not green – it is made from fossil fuel derivatives. But, as demand increases, the required economies of scale for green hydrogen will be more easily reached. Availability of green hydrogen capacity is limited by the amount of spare green energy available. The German motor industry is investing heavily in hydrogen power trains. Hydrogen may also be a serious candidate for extractive industries.

## EVOLVING FUEL USAGE

Each transport sector has its own specific fuel types, and the evolving alternatives are also tailored to each sector. The table below illustrates the likely evolution of options by application. For most, there is no easy solution, and it is widely expected that a combination of options will be. Aviation carries the greatest challenge of any sector, as the energy efficiency per unit weight of fossil fuels is extremely difficult to replace. Sustainable aviation fuel (SAF) technology pathways are well under way, with bioethanol to jet emerging as one alternative. For the storage sector, product segregation will be the main challenge, as will high quality tracking of hydrocarbon origin.

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Application	Today	2030s	Towards 2050
<b>Aviation</b>	Jet	Jet + offsets / Carbon capture, utilisation and storage (CCUS) SAF Electric	Sustainable aviation fuel (SAF)  Jet + offsets / CCUS Electric
<b>Sea</b>	Fuel oil Marine gasoil LNG Methanol LPG	Fuel oil Marine gasoil Renewable diesel Biofuels LNG Blue ammonia Blue hydrogen	Green ammonia Green methanol Renewable diesel Biofuels LNG Blue ammonia Blue hydrogen
<b>Passenger car</b>	Gasoline Crop ethanol	Gasoline Advanced ethanol Battery / hybrid	Electric
<b>Diesel (car and van)</b>	Diesel FAME Renewable diesel	Diesel Advanced biodiesel Renewable diesel	Electric
<b>Diesel (truck and bus)</b>	Diesel FAME Renewable diesel	Diesel Advanced biodiesel Renewable diesel	CNG Electric Fuel cell
<b>Powergen</b>		Ammonia CO <sub>2</sub> Blue hydrogen	Ammonia CO <sub>2</sub> Green hydrogen
<b>Energy storage</b>		Battery Cryogenic	

The shipping sector appears complex, but this is largely driven by the fact that this sector is currently using some of the dirtiest fuels. Alternative low carbon fuels seem to be attracting considerable interest. The front-runners in the discussion are e-methanol and ammonia, especially when produced via electrolysis using wind and solar power. Also, a B30 fuel oil with 70% very low sulphur fuel oil (VLSFO) and 30% fatty acid methyl ester (FAME), is proving successful in trials. The storage sector needs to consider all of them as an important part of the future fuel mix.

Ammonia will also play a role as a means of transporting green hydrogen: hydrogen can be readily converted into ammonia and vice versa, and ammonia is far easier to ship than hydrogen. Ammonia is hazardous but the handling protocols are well understood.

**FUTURE FOR THE SECTOR**

So, the tank storage industry must adapt and invest for the future and seek out new storage contracts for the storage of emerging and alternative

fuels and embrace innovation, adapting the terminals infrastructure to maximise flexibility. Terminals may need to cast their nets wider than transition fuels and consider sectors including Petrochemicals, food storage or environmental recycling of liquids. Moving from the traditional oil storage terminal model, where there may be a limited number of different products and little in the way of product, to a multi-product, frequent product change terminal, requires a different strategy and operating plan. The terminal infrastructure also needs to be adapted to embrace the required flexibility to cope with multiple products, with simultaneous tank, rail, pipeline and truck operations. This will require investments in additional pipelines and pumps, along with automated control and monitoring systems so that individual tanks can be filled and emptied with a wider variety of liquid products. It is quite possible that energy transition may lead to a surplus of tanks and terminals, so 'survival of the fittest' will also likely be a major consideration to CEO's considering their strategic plan over the next decade and beyond.

**For more information:**

Mark Waddington is the director and senior consultant at Channoil Energy. He will give a presentation on this topic at StocExpo 2022, which will be held from 23-35 May 2022 in Rotterdam, the Netherlands.

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01 Future fuel options by sector.  
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