



INTESA SANPAOLO  
INNOVATION CENTER

# INDUSTRY TRENDS REPORT **AUTOMOTIVE, TRANSPORTATION AND LOGISTICS**

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May 2021





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# EXECUTIVE SUMMARY

Over the last few years, the pace of change in the automotive space has accelerated with the share of **diesel** engines in Europe and the US declining rapidly as the popularity of **electric**, hybrid and emerging propulsion systems such as hydrogen **fuel cell** continues to rise. In addition to step changes in powertrains, the industry is also being fundamentally reshaped by the emergence of, in the short term, increasingly **connected** and, in the long term, **autonomous** commercial and personal vehicles.

In 2019, the last full year for which figures are currently available, **30%** of vehicles sold in Europe were diesel, **down from 45%** in 2017. OEMs are exploring new ways in which to improve the efficiency of combustion engines but the overall direction of travel is clear with government intervention requiring the vendors to reduce emissions whilst, at the same time, rewarding the buyers for acquiring vehicles which pollute less or not at all.

**Electric** Vehicles, including Battery and Plug-in Hybrid, have been the chief beneficiary of this. 1.9m EVs are currently on the roads of Europe and, although the pandemic has taken its toll, generous tax benefits and changing consumer needs are combining to drive growth with countries aiming to replicate Norway's success.

The development of Zero Emission Vehicles is supported by new demand but also intense supply-side activity with **charging** and **battery** technologies reaching, for the former, the critical mass and, for the latter, performance levels needed to support growth.

Frost & Sullivan estimates that there will be a fivefold increase in the number of points available in Europe between 2019 and 2027 while the growing need for faster charging capabilities is one of the factors behind the search for safer and denser solutions.

Currently, solid-state batteries are emerging as a promising alternative to the go-to lithium-ion solutions which market participants across the value chain are looking to safely recycle.

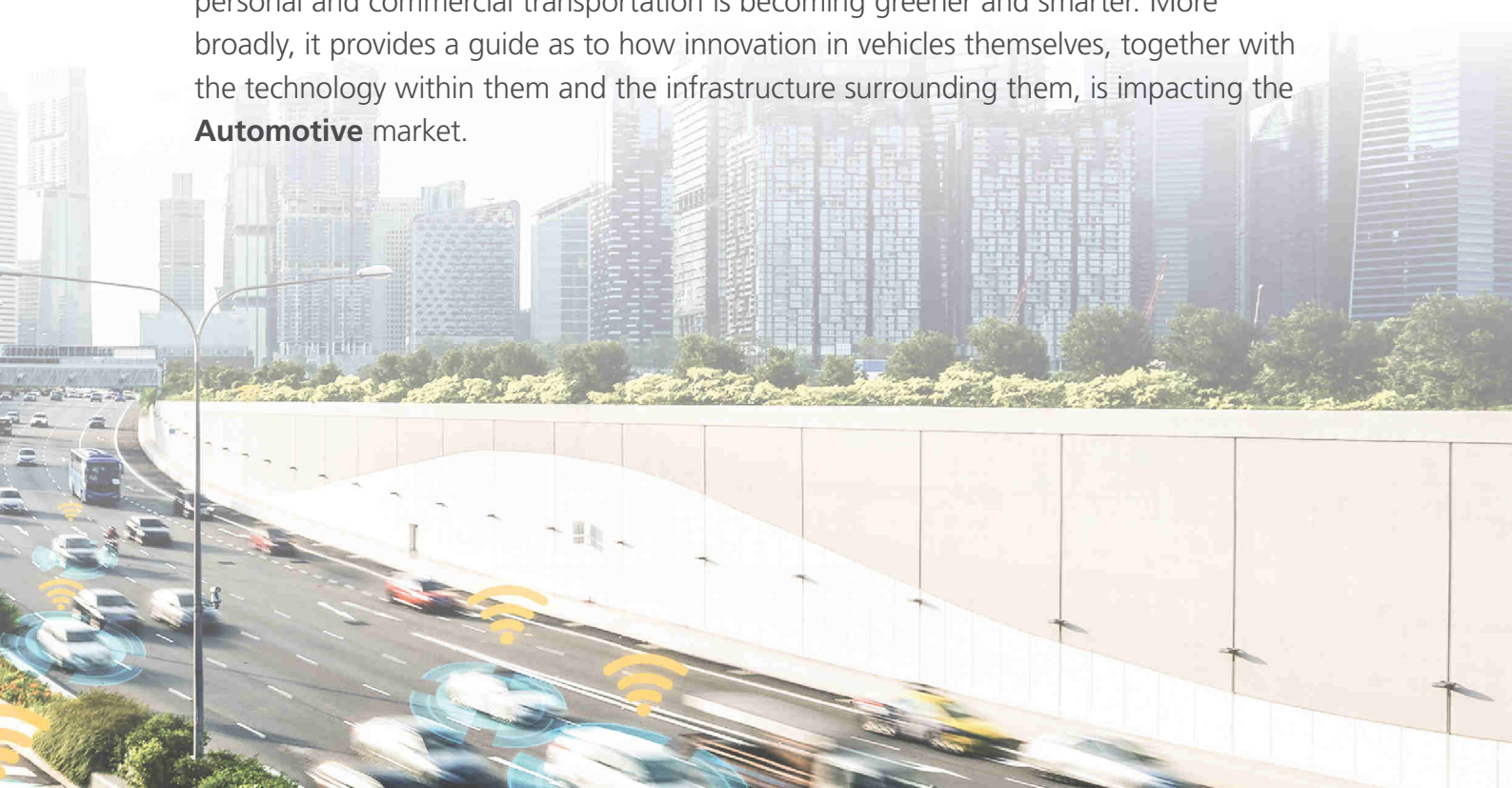


In the longer term, **Fuel Cell** EVs have the potential to offer motorists improved driving performance, longer range and faster recharging times than BEVs, PHEVs and many ICEs. Growth here is also being aided by government intervention and the expansion of the related charging infrastructure as well as material falls in costs.

Frost & Sullivan estimates that, by 2022, 75% of cars globally will be highly **connected**, mainly due to penetration of embedded systems. At the moment, OEMs' and Tier I suppliers' focus is on building out their offering in established areas such as navigation and audio. They are also working on reshaping the way in motorists interact with their vehicles with a view to providing value-added services like in-vehicle market places. In the longer term, monetising the data that connected cars generate will unlock huge opportunities.

In the mid-term, Frost & Sullivan expects that vehicles will not only be connected but also **autonomous**. All cars will offer at least some features by 2029 but the overall shift toward a driverless car is taking longer than the industry envisaged with OEMs looking to "L2+" technologies to bridge the gap and provide a platform for more sophisticated solutions in the future. Autonomous trucking is an area of great activity and part of a wider move towards autonomous Commercial Vehicles including shuttles, tractors and even vessels.

This paper examines each of these areas in turn with a focus on the ways in which personal and commercial transportation is becoming greener and smarter. More broadly, it provides a guide as to how innovation in vehicles themselves, together with the technology within them and the infrastructure surrounding them, is impacting the **Automotive** market.



One Time Password  
**0218**  
access permission

# PRINCIPAL ABBREVIATIONS

Your Number  
**80213648**  
access permission

/Autonomous  
/Sensing  
/Communication  
/Battery  
/Navigation  
/Wireless  
/Ecology

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<b>AC</b>	<i>Alternating Current</i>	<b>M</b>	<i>Million</i>
<b>ADAS</b>	<i>Advanced Driver Assistance System</i>	<b>MaaS</b>	<i>Mobility-as-a-Service</i>
<b>AI</b>	<i>Artificial Intelligence</i>	<b>MAAS</b>	<i>Maritime Autonomous Surface Ship</i>
<b>APAC</b>	<i>Asia Pacific</i>	<b>MEA</b>	<i>Membrane Electrode Assembly</i>
<b>AR</b>	<i>Augmented Reality</i>	<b>MNO</b>	<i>Mobile Network Operator</i>
<b>B</b>	<i>Billion</i>	<b>Mpg</b>	<i>Miles per gallon</i>
<b>BEV</b>	<i>Battery Electric Vehicle</i>	<b>MR</b>	<i>Mixed Reality</i>
<b>CaaS</b>	<i>Cars-as-a-Service</i>	<b>Nm</b>	<i>Newton metre</i>
<b>CAPEX</b>	<i>Capital Expenditure</i>	<b>NVH</b>	<i>Noise, Vibration and Harshness</i>
<b>CASE</b>	<i>Connected, Autonomous, Shared, Electric</i>	<b>O&amp;G</b>	<i>Oil and Gas</i>
<b>CLaaS</b>	<i>Connected Living-as-a-Service</i>	<b>OBC</b>	<i>On-board Charger</i>
<b>DC</b>	<i>Direct Current</i>	<b>OEM</b>	<i>Original Equipment Manufacturer</i>
<b>ECU</b>	<i>Engine Control Unit</i>	<b>OPEX</b>	<i>Operating Expenditure</i>
<b>EOL</b>	<i>End Of Life</i>	<b>OS</b>	<i>Operating System</i>
<b>ETA</b>	<i>Estimated Times of Arrival</i>	<b>OTA</b>	<i>Over-The-Air</i>
<b>EU</b>	<i>European Union</i>	<b>PHEV</b>	<i>Plug-in Hybrid Electric Vehicle</i>
<b>EV</b>	<i>Electric Vehicle</i>	<b>PM</b>	<i>Particulate Matter</i>
<b>FCEV</b>	<i>Fuel Cell Electric Vehicle</i>	<b>PS</b>	<i>Pferdestärke (Horsepower)</i>
<b>FNOL</b>	<i>First Notice of Loss</i>	<b>RDE</b>	<i>Real Driving Emission</i>
<b>GWh</b>	<i>Gigawatt hour</i>	<b>SCR</b>	<i>Selective Catalytic Reduction</i>
<b>H2</b>	<i>Hydrogen</i>	<b>SIEM</b>	<i>Security Information and Event Management</i>
<b>HD</b>	<i>High Definition</i>	<b>SSB</b>	<i>Solid-state Battery</i>
<b>HMI</b>	<i>Human Machine Interface</i>	<b>TSP</b>	<i>Telematics Service Provider</i>
<b>HP</b>	<i>Horsepower</i>	<b>UAV</b>	<i>Unmanned Aerial Vehicle</i>
<b>HUD</b>	<i>Head-up Display</i>	<b>UBI</b>	<i>Usage Based Insurance</i>
<b>ICE</b>	<i>Internal Combustion Engine</i>	<b>UGV</b>	<i>Unmanned Ground Vehicle</i>
<b>IoT</b>	<i>Internet of Things</i>	<b>UK</b>	<i>United Kingdom</i>
<b>JV</b>	<i>Joint Venture</i>	<b>US</b>	<i>United States</i>
<b>Kg</b>	<i>Kilogramme</i>	<b>UX</b>	<i>User Experience</i>
<b>Km</b>	<i>Kilometre</i>	<b>V2X</b>	<i>Vehicle To Everything</i>
<b>Kmpl</b>	<i>Kilometres per litre</i>	<b>VR</b>	<i>Virtual Reality</i>
<b>kW</b>	<i>Kilowatt</i>	<b>VSOC</b>	<i>Vehicle Security Operations Centre</i>
<b>LCV</b>	<i>Light Commercial Vehicle</i>	<b>WLTP</b>	<i>Worldwide Harmonised Light Vehicles Test</i>
<b>LIB</b>	<i>Lithium-ion Battery</i>	<b>ZEV</b>	<i>Zero Emission Vehicles</i>
<b>Li-ion</b>	<i>Lithium-ion</i>	<b>ZLEV</b>	<i>Zero Level Emission Vehicle</i>

#### **ABOUT INTESA SANPAOLO INNOVATION CENTER:**

Intesa Sanpaolo Innovation Center is the company of Intesa Sanpaolo Group dedicated to innovation: it explores and learns new business and research models and acts as a stimulus and engine for the new economy in Italy. The company invests in applied research projects and high potential start-ups, to foster the competitiveness of the Group and its customers and accelerate the development of the circular economy in Italy.

Based in the Turin skyscraper designed by Renzo Piano, with its national and international network of hubs and laboratories, the Innovation Center is an enabler of relations with other stakeholders of the innovation ecosystem - such as tech companies, start-ups, incubators, research centres and universities - and a promoter of new forms of entrepreneurship in accessing venture capital. Intesa Sanpaolo Innovation Center focuses mainly on circular economy, development of the most promising start-ups, venture capital investments of the management company Neva SGR and applied research

For further detail on Intesa Sanpaolo Innovation Center products and services, please contact [businessdevelopment@intesasanpaoloinnovationcenter.com](mailto:businessdevelopment@intesasanpaoloinnovationcenter.com)

#### **ABOUT FROST & SULLIVAN:**

For over five decades, Frost & Sullivan has become world-renowned for its role in helping investors, corporate leaders and governments navigate economic changes and identify disruptive technologies, Mega Trends, new business models and companies to action, resulting in a continuous flow of growth opportunities to drive future success.

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