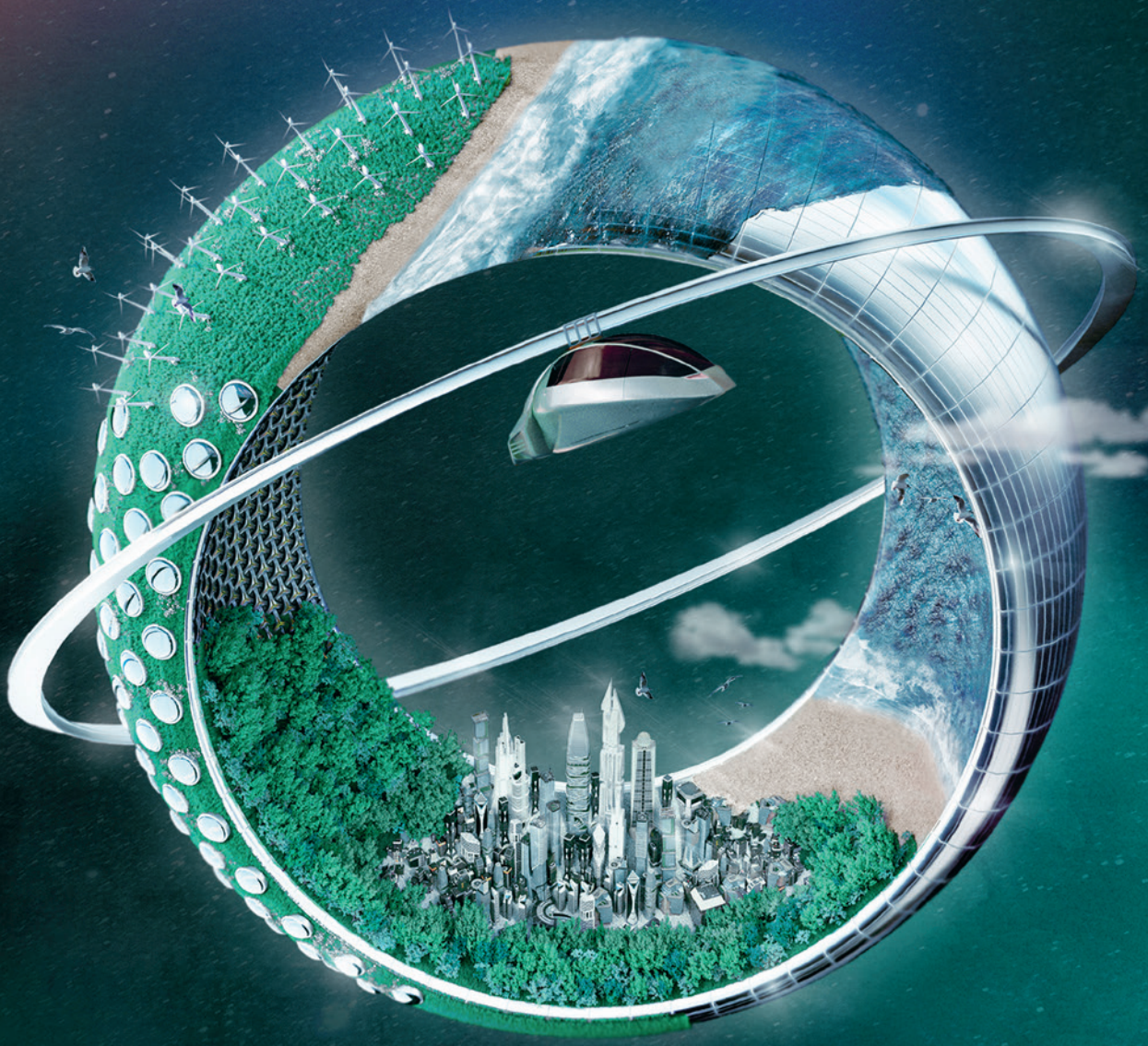
TQ FUTURE MOBILITY

FUTURE MARKETS MAGAZINE by EBV Elektronik



FROM SCI-FI TO REALITY – THIS IS THE FUTURE OF MOBILITY

ACES – DRIVING MOBILITY

Autonomous
Computers take over control of the vehicle from humans. Artificial intelligence and computing power are the key to higher levels of automation.

Connected
Vehicles are increasingly exchanging more and more data, both with a central hub and with each other via mobile communications, WiFi and satellite, etc.

Electric
The transition from traditional to electrified drive technology requires more and more diverse electronics, such as control systems, sensors and high voltage systems.

Shared
The convenience that sharing mobility offers is only possible due to mobile data processing, which is why electronics, connectivity and cloud solutions play an important role in this trend.

How we transport goods and travel in the future will be shaped significantly by four technological trends: autonomous, connected, electric and shared mobility. These are brought together under the acronym "ACES" or "CASE".

It would not be possible to implement these technologies without the large-scale use of micro-electronics with computer processors, power electronics, sensor units or communications architectures. These technological trends originate from the automotive industry and they apply to all other forms of transport. After all, mobility is no longer primarily about the vehicle itself, but about how a route can be covered most efficiently and comfortably – whether by road, rail, air or water. Against this background, mobility offers one of the biggest opportunities for semiconductors: IC Insights predicts that 14 percent of all integrated circuits produced worldwide will be used in vehicles by 2025.

SEMICONDUCTORS – PAVING THE WAY FOR A CHANGING WORLD OF MOBILITY

The world of mobility is in the midst of a radical transformation, the likes of which has arguably not been seen since the advent of the car. Entirely new mobility solutions are coming onto the market, and this can be seen not only on the streets but also the rail network, the water and in the air. One such example is air taxis, which are on the cusp of becoming a reality in everyday life. Until recently, cars have generally been seen as a status symbol. But nowadays they are considered to be more of a burden, as they take up space, cost a lot and harm the environment. The sharing economy, made up of various different concepts and apps, is gaining huge traction and outstripping personal car ownership. It is not just cars that will be networked, autonomous and electric in the future, but aircraft, ships and railways too.

The majority of recent innovations in the mobility sector would not have been possible without the semiconductor. Its fields of application range from sensors and environment detection to power electronics for electric motors and artificial intelligence for traffic management. According to the analysts at Market Research Future, the semiconductor market in the automotive industry alone is set to grow by 8.8 percent annually from 2022, to more than 85 billion US dollars in 2030. Electromobility is an important driver here. According to Yole Développement, the market for power semiconductors will triple to around 5.6 billion US dollars between 2020 and 2026. The figures are even more impressive when it comes to chips for autonomous vehicles. According to Precedence Research, by 2030 they will have reached a market volume of 29 billion US dollars, which corresponds to an average annual growth of more than 38 percent in the period 2022 to 2030.

At the same time, the demands of urban populations on vehicle use are increasing, which calls for a smart form of mobility. As well as innovative modes of transportation, this includes vehicle sharing, affordable local public transport, Mobility as a Service, and improved traffic and mobility management. Precedence Research predicts that the market volume in 2022 will already be almost 58 billion US dollars – and by 2030 this is expected to grow to 250 billion US dollars. Aspects such as the 5G mobile communications network, cloud technologies, wearables and data processing capacities at data centres and the edge also belong to the future of mobility solutions.

Innovative semiconductor-based technologies will do more than make vehicles smarter – they will fundamentally change the way we see and use transportation. That holds great prospects for both the semiconductor industry and manufacturers who develop mobility solutions. As a passionate semiconductor distributor, EBV Elektronik would be more than happy to help you make the most of these opportunities. For now, I hope this makes for exciting reading. It's time to immerse yourself in the world of future mobility!

Thomas Staudinger
President of EBV Elektronik

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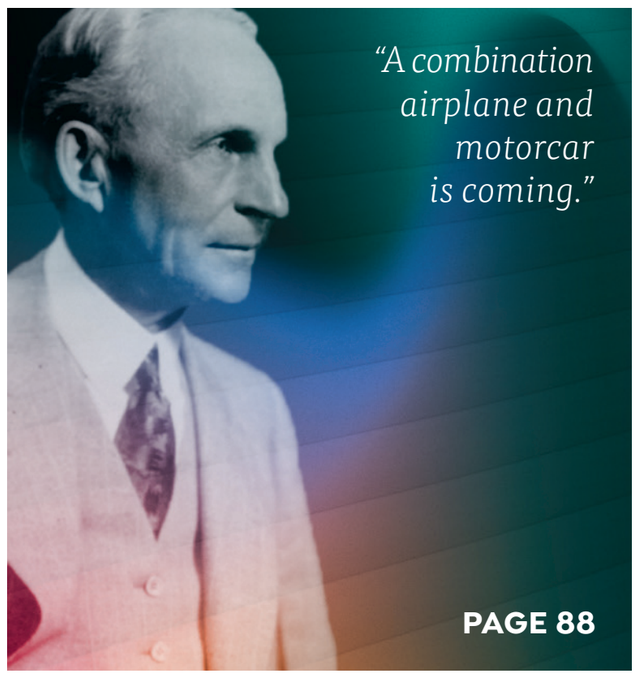

VISIONS

THE MOST IMPORTANT INNOVATIONS OF OUR TIME

Electric vehicle start-ups have come from nothing but have become some of the richest companies in the world. Drivers have been caught napping at the wheel in self-driving vehicles and flying electric taxis have begun to leave the pages of science fiction books. Almost no other sector is going through such radical upheaval as mobility.

OVERARCHING TRANSFORMATION

Road, rail, air and water traffic are all affected by these disruptive changes. Digitalisation and decarbonisation are changing transport methods and infrastructure. The changes are affecting more than just individual vehicles; the connectivity of different modes of transport, both directly with one another as well as with traffic management systems and service providers, also offers immense potential for the future. “Future-proof, sustainable mobility systems are being designed by combining automated driving and connected systems. Expertise in electrical engineering and computer science is key to the success of this transformation, now even more than in previous years,” says Professor Florian Lang, Head of Intelligent Mobility Systems Studies at the University of Technology, Business and Design Konstanz (HTWG). The rapid pace of change has been aided in no small part by technological leaps in the base components and materials, from battery technology with ever higher power density to intelligent environmental sensor technology.

EMISSION-FREE FUTURE

Two big drivers of change in the mobility sector are climate change and the associated renunciation of fossil fuels. Today’s transport across all sectors is predominately reliant on fossil fuels. According to the International Energy Agency, 7.7 gigatonnes of CO_2 were emitted by personal and freight transport in 2021 alone – which makes up 37 percent of CO_2 emissions from all end use sectors. However, countries around the world have already started trying to change this: in the European Union, only emission-free cars will be approved from 2035. This will also be the case in California and Great Britain. Even China, the biggest automotive market in the world, will only be approving environmentally friendly vehicles from 2035. This means that electric motors will become the predominant form of propulsion in the world of mobility. And not just for cars: in shipping, electric ferry deliveries have increased to around 80 megawatt hours per year, according to IDTechEx. Furthermore, the costs for battery packs have fallen to less than 600 US dollars per kilowatt hour, energy density has increased and innovations in heat management ►

have improved safety by a significant degree. Similar reason are also encouraging investment in electric air taxis, with American Airlines, UPS and Airline Saudia having already placed intial orders. The European manufacturer Volocopter wants to take its air taxi service to the Olympic Games in Paris in 2024. Electrification brings yet another advantage: urban transport will become quieter and cleaner – and increasingly healthier for those who live in urban centres.

URBANISATION IS SHAPING MOBILITY TRENDS

Urbanisation is the second significant driver behind changes in mobility, with more than 60 percent of the global population expected to be living in cities by 2030. The urban mobility trends of the younger generations show a growing preference for cycling, walking, public transport and shared mobility services, rather than using your own car. Experts expect that the sharing of electric, autonomous cars will be part of a larger, integrated, multimodal eco-system, in which the main focus will be the provision of highly individual, seamless and needs-based transport services. This also includes last-mile solutions such as drones or micro-mobility within cities.

AUTONOMOUS VEHICLES ARE CHANGING HABITS

IDTechEx estimates that commercial autonomous cars or robo-taxis will be ready for the market as early as 2024. User transport habits will fundamentally change with the advent of autonomous vehicles: currently it is people – more specifically the driver – accounting for the highest costs in popular ride-hailing services such as Uber or Lyft. With robo-taxis, drivers will become redundant, which will allow mobility services to be significantly cheaper. IDTechEx assumes that the market for this will grow by an average of 30 percent each year. For future generations, private car ownership will be a relic of the past. This will also mean enormous changes for car manufacturers: given that an autonomous car will be able to provide services for multiple people every day, the number of cars being sold will decline, even if the total number of kilometres driven worldwide increases. The manufacturers could compensate for this with new business models for innovative services. Digital eco-systems which integrate customers, distributors and partners are the main priority for almost all manufacturers.

In this way, mobility is much more than just a way to get around, at least futurologist and urban geographer Dr Stefan Carsten thinks so: “It is, in fact, the driving force of social and economic existence, in both the physical and virtual realms. It determines which forms of transport we use to travel and what our journey looks like. It defines the concepts and drives of the future and is at the centre of the most important innovations of our time, innovations that we urgently need in order to successfully manage the social and economic impacts of coronavirus and climate change in a sustainable way.” TQ

“Electrical engineering and information technology are the key elements for the successful transformation of the mobility sector.”

~60

percent
of all cars sold worldwide will have Level 4 automation by 2040.

Source: IDTechEx

1.3

trillion US dollars
will be the revenue potential of “Mobility as a Service” by 2025.

Source: Frost & Sullivan

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