Press Release

FEV Zero CO_2 Mobility Conference: no more fossil fuels at the filling stations by 2035 – replacement with sustainable energy carriers

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Aachen/Berlin, January 2024 – The European Union is currently not "Fit for 55" regarding its self-defined target of reducing greenhouse gas emissions by at least 55 percent by 2030 – particularly, when it comes to cutting emissions in the mobility sector. This was the essence of the 7th international FEV Zero CO_2 Mobility Conference in Berlin. While the technologies and tools necessary for a successful mobility transition are in place with battery-electric and hydrogen-based applications, the phase-out of fossil fuels is happening far too slow. FEV, a globally leading innovation driver for sustainable mobility and energy solutions, like the other conference participants is missing the regulatory framework enabling the move towards emission-free mobility with planning reliability.

Fossil fuels at the filling station must be replaced by sustainable energy carriers as quickly as possible. This includes both renewable electricity and non-fossil fuels to achieve the prompt establishment of a broad, intelligent technology portfolio in the mobility sector, consisting of battery-electric vehicles (BEVs), hybrid-BEVs and fuel cells. In addition, hydrogen or e-fuel-

powered combustion engines and SAF (Sustainable Aviation Fuel) for use in aviation need to be included.

“Rather than the 1.5 degrees Celsius of warming specified in the Paris Climate Agreement, we are currently heading towards 4 degrees,” said Dr. Norbert W. Alt, COO of FEV and host of the conference, in his keynote speech. “We are way too slow. One of the biggest challenges is replacing the operation of vehicles with conventional combustion engines using fossil fuels. These more than 1.4 billion passenger cars and light commercial vehicles globally need to be powered by sustainable energy carriers as quickly as possible. This is why not only passenger cars, but also light and heavy commercial vehicles are currently being electrified for long distances.”

One step further are the demands of the young generation, represented at the conference by “Fridays for Future”, for a complete turnaround in mobility. Considering that large parts of city centers around the world are occupied by vehicles that are parked for an average of 23 hours a day, it becomes clear that new technologies alone are not sufficient for the continuation of today’s familiar individual mobility. As an enabler of the mobility turnaround, they can only be fully effective if a change in behavior takes place at the same time. Future mobility concepts in the urban environment must therefore move away from individual transportation and instead rely largely on shared mobility and public transportation. This would also convince the younger generation as future customers.

Wind power, PV and green hydrogen fueling the future

Climate-neutrally produced “green” hydrogen is a key energy carrier and lever for the mobility and energy transition. While battery technology with regenerative electricity is becoming increasingly established in passenger cars, hydrogen for commercial vehicles is a viable alternative technology to batteries in the application for fuel cells and combustion engines. In the passenger car sector, pure BEVs will dominate the global new car fleet from around 2030. They will be flanked by so-called hybrid-BEVs. These serial hybrids can replace conventional combustion engines in everyday life by operating up to 90 percent in electric mode and thus significantly reducing CO_2 emissions. At the same time, they meet extreme range requirements, for example in trailer operation with SUVs. In China, these serial hybrids have currently achieved a market share of 30 percent of so-called NEVs (new energy vehicles) with batteries. Ideally, their combustion engines are powered by H_2-based e-fuels.

E-fuels are also interesting as hydrogen derivatives due to their high energy density in the form of e-kerosene for sustainable aviation fuel (SAF) and as e-methanol for the maritime industry. The off-road sector, in turn, is highly diversified in terms of the required daily ranges and runtimes: While batteries make perfect sense for small construction machines, ride-on mowers or tractors for special crops, they are no longer an option for larger outputs of around 50 kW or more.

The hydrogen-powered off-grid charger presented at the conference was an interesting example of how hydrogen as primary energy carrier can be used to meet different needs: it can

be used to upgrade any hydrogen filling station into a fast charger for BEVs (battery electric vehicles). In combination with a mobile hydrogen supply container, completely independent operation is also possible.

Instead of a time-consuming race between individual solutions and political discussions, the mobility transition is dependent on an intelligent technology portfolio that provides the optimum solution for every application, according to the conference participants. The common goal for all technology options is to replace the use of fossil fuels with sustainable energy carriers. There was also a consensus that most of the strategies and tools required are already available.

The framework conditions have to be appropriate

However, sustainable energy carriers and technologies are currently too expensive for large-scale use. To pick up the necessary pace in the defossilization of the vehicle sector, they must be scaled up through extensive investment and thus made competitive on the market. For example, fertilizer and steel production alone, as well as marine and aviation fuels, require 300 million tons of green hydrogen per year to become sustainable. Two major projects on the African continent were presented at the conference as examples of how hydrogen can be produced in such large quantities from wind and solar power in the future in an economically attractive way. However, the experts also insisted on a faster expansion of electrolyzer capacities and hydrogen filling stations in Germany. In their eyes, the currently lacking reliable political and economic framework is the biggest hurdle to overcome in order to tackle such projects with investment security.

The participants discussed the conversion of existing natural gas infrastructure for the storage and distribution of hydrogen as a cost-effective and, above all, quick solution. As existing permits also apply to hydrogen, this approach promises significant time savings compared to new construction. At the same time, the impact on nature, for example through excavation work, and the disruption to local residents would be minimized.

In the area of BEVs, solid-state batteries can represent a fundamental advance in terms of energy density, durability and safety. Here, too, the focus is on achieving economies of scale in cell production to be able to offer this new generation of batteries at competitive costs. The conference also presented and discussed solutions for a sensible charging behavior of electric vehicles (charging as quickly as necessary, not as quickly as possible) and the supply of sustainable electrical energy for mobility.

The pressure for a lower cost level must come from the regulatory side, for example via CO_2-pricing – globally harmonized if possible – which is used to enforce sustainable solutions. Financing models that provide special incentives for green investments could be another building block for faster decarbonization.

Holistic thinking is key

For climate protection to succeed, all stakeholders must think and plan holistically – putting the focus on tank-to-wheel or tailpipe emissions is clearly not enough: instead, the entire ecological footprint of a means of transportation must be put to the test over

its entire life cycle (LCA – Life Cycle Assessment). This includes not only the sustainable generation, storage and distribution of electricity and green fuels, but also the entire automotive value chain from development and production through to recycling (“cradle-to-grave”). By analyzing the entire carbon footprint, more and more market players are creating transparency about the true sustainability of their technology. Regarding the CO_2-backpack of an electric vehicle in production, a model of a sustainable industry only indicated 2,000 kilometers of travel required to offset the CO_2-emissions of a conventional combustion engine vehicle.

In summary, “Fit for 55” is still an achievable and mandatory goal to effectively counteract climate change if the corresponding actions are being applied. The required technologies are basically developed and available but need to be evolved into the breadth of OEM product portfolios. Now, it is up to politics to create the appropriate framework conditions to achieve a large-scale distribution, market penetration and planning security as quickly as possible.

Footage

Caption: At the FEV International Zero CO_2 Mobility Conference 2023 in Berlin, participants discussed actions and technologies to achieve the "Fit for 55" goals with zero-emission mobility.
Source: FEV

About FEV

FEV has always pushed the limits.
FEV is a globally leading engineering provider in the automotive industry and internationally recognized leader of innovation across different sectors and industries. Professor Franz Pischinger laid the foundations by combining his background in academia and engineering with a great vision for continual progress. The company has supplied solutions and strategy consulting to the world's largest automotive OEMs and has supported customers through the entire transportation and mobility ecosystem.

As the world continues to evolve, so does FEV.
That’s why FEV is unleashing its technological and strategic expertise into other areas. It applies its forward thinking to the energy sector. And its software and system know-how will enable the company to lead the way making intelligent solutions available to everyone. FEV brings together the brightest minds from different backgrounds and specialties to find new solutions for both current and future challenges.

But FEV won’t stop there.
Looking ahead, FEV continues to push the limits of innovation. With its highly qualified > 7,300 employees at more than 40 locations globally, FEV imagines solutions that don’t just meet today’s needs but tomorrow’s. Ultimately, FEV keeps evolving – to a better, cleaner future built on sustainable mobility, energy

and software that drives everything. For the company’s partners, its people and the world. #FeelEVolution