Press release

Stuttgart, July 23, 2025

MAHLE goes full speed ahead with decarbonization

- Technology diversity is and remains the strategic approach of MAHLE
- Addition of further sustainable drive system technologies to e-mobility accelerates climate protection
- MAHLE calls for the revision of CO_2 legislation in Europe in the near future to take account of sustainable internal combustion engines and fuels
- MAHLE CEO Franz: “We need technology diversity in regulations – for climate protection, to strengthen the European automotive industry and to safeguard employment in Europe.”
- At IAA Mobility, MAHLE is showcasing technologies for accelerating electrification and reducing CO_2 emissions in road traffic
- Efficiency improvements not only with respect to products but also business processes with a view to boosting competitive strength and resilience

Technology diversity is and remains the strategic approach of MAHLE and the most promising way to reduce greenhouse gas emissions rapidly and effectively. In view of the sluggish ramp-up of e-mobility, MAHLE considers that it is necessary to offer other types of electrification such as hybrid vehicles or range extenders in addition to pure battery-electric vehicles and for politicians to make these options possible. At the MAHLE Tech Day in Stuttgart, CEO Arnd Franz called for the rapid revision of carbon dioxide legislation in Europe to take into account sustainable internal combustion engines and climate-neutral fuels. “As a supplier, we need technology neutrality in legislation. So that we can make rapid progress with climate protection. So that the expertise and innovative strength of the European automotive industry can continue to flourish in Europe. So that jobs remain in Europe and Europe’s economy can recover its old strength.” In a volatile and extremely challenging business environment, the automotive supplier is focusing even more strongly on efficiency improvements – not only with respect to its products but also in its business processes with a view to further strengthening its competitiveness and resilience. At IAA Mobility in Munich, MAHLE is showcasing technologies for accelerating electrification and reducing CO_2 emissions in road traffic. IAA Mobility is being held from September 9 to 14, 2025, and the MAHLE stand is located in Hall A1.

Technology neutrality to reduce CO_2 emissions and boost the economy

“We have a clear commitment to climate protection. And to e-mobility. We are ready,” Arnd Franz told an audience of international journalists on Wednesday. In addition to products for pure e-mobility, MAHLE is also focusing its efforts on hybrid vehicles and advanced range extenders to boost the ranges of electric vehicles and to make it easier for customers to change over from pure ICE vehicles. Especially China is currently recording strong growth in these electric drive systems. It is forecast that the share of electric vehicles with range extenders in worldwide production of electrified passenger cars and light commercial vehicles will grow by 15 percent per year up to 2030. MAHLE intends to share in this growth.

The MAHLE CEO also mentioned the high decarbonization potential of renewable fuels, which is not yet being fully tapped. “Any plan for rapid and effective climate protection in road traffic is incomplete without renewable fuels. In addition to hydrogen, especially in the transport sector, biofuels can make an effective contribution to individual mobility,” he emphasized. He added that this would allow more rapid progress, especially with respect to the vehicle fleet. The share of renewable fuels, i.e. biofuels and synthetic fuels, used in road traffic would need to rise to 30 percent by 2030 in order to reach the climate goals. “MAHLE technologies already allow the direct use of renewable fuels without any compromises.”

Franz said that Europe was facing a crucial decision for the future with respect to CO_2 emissions regulations. “The revision of CO_2 legislation in Europe must not be delayed. Internal combustion engines operated using climate-neutral fuels must be recognized as part of the solution.“ In the present regulatory situation, he said that MAHLE as a company was forced to consider a stop of all investments for the expansion and replacement of capacities for sustainable internal combustion engines in Europe. If the EU was not prepared to change its position with regard to a ban on ICE vehicles, such an investment stop would be the logical consequence.

With its MAHLE 2030+ strategy, MAHLE, as a globally active automotive supplier, covers all types of powertrain which can make a key contribution to climate protection: electrification and sustainable internal combustion engines as well as thermal management to boost the efficiency and performance of the two technologies.

Efficiency drives the transformation

In a challenging business environment where trade relations face global uncertainties, MAHLE is increasingly committed to efficiency in connection with the current transition. This also applies to its processes, with a view to enhancing its competitiveness and becoming more crisis-proof.

An example of successful efficiency measures is the new company structure that MAHLE has recently implemented throughout the world from its own resources in only 200 days. This also included the repositioning of purchasing and the strengthening of regional responsibilities with a view to reacting more effectively to customers' local requirements. The group's internal cost effectiveness and profitability program "Back on Track 2025" continues to run at full speed. The plants are also working consistently on efficiency improvements. This approach includes initiatives to reduce energy consumption such as the shut-off management of production equipment or the installation of photovoltaic thermal systems.

MAHLE is also expanding the use of artificial intelligence (AI) within the company. The use of machine learning in selected areas optimizes both direct production and indirect processes. Furthermore, generative AI is being put to successful use in product development in order to save time and resources in the development of future-oriented innovations. The most recent development example is the bionic radial blower for air conditioning systems – inspired by a penguin's flippers – which MAHLE will be showcasing at IAA Mobility.

MAHLE at IAA Mobility 2025

Under the motto of "Efficiency^3", MAHLE is presenting the latest developments in its three strategic areas at this year's IAA Mobility in Munich: a range extender to boost the range of electric vehicles, a compact thermal management module with integrated heat pump to significantly extend the range of electric vehicles and ethanol-compatible engine components which will considerably reduce both the fuel consumption and the CO_2 emissions of internal combustion engines.

Dr. Marco Warth, Vice President Corporate Research and Advanced Engineering at MAHLE, said: "At MAHLE, we not only define efficiency as the optimum relationship between effort and results – we also breathe life into this principle with innovative solutions that conserve resources, save energy and boost the transition to sustainable mobility."

Range extender system ensures progress with battery-electric vehicles

Many car drivers have a positive attitude to e-mobility. However, it has become clear that they wish to combine the benefits of an electric car with the security offered by additional range. Electric vehicles with range extenders can therefore help to further accelerate the adoption of electric vehicles by relieving consumers' range anxiety. Range extenders supply energy for the electric motor when the charge of the vehicle battery has been depleted.

The new range extender from MAHLE, which is being showcased for the first time at IAA Mobility, will increase the market acceptance of battery-electric vehicles throughout the world and allow the cost-effective, resource-efficient

“rightsizing” of batteries without customers having to accept long waits at battery charging stations on long trips.

The new system, with a rated continuous output of 85 kilowatts (kW), consists of an especially efficient high-voltage generator powered by a compact internal combustion engine. The heart of the 800 V generator is a permanently excited electric generator with a fully integrated cooling system. In addition to a high peak efficiency in excess of 97 percent, this design ensures a high continuous performance density (in excess of 50 kW per liter), minimizing material and space requirements as well as costs. One of the special features of the MAHLE design is the high-performance direct cooling of the rotor, which significantly reduces the need for heavy rare earth elements, among other benefits.

The boosted high-tech internal combustion engine used in the range extender features MAHLE jet ignition combustion technology, direct injection, turbocharging and Miller valve timing, i.e. the special control of the intake valves of an internal combustion engine to allow more efficient combustion and ensure lower pollutant emissions. In range extender operation, the engine offers a high efficiency of more than 42 percent and its noise level is inconspicuous.

“It is small, lightweight, easy to integrate and conserves resources – MAHLE’s range extender is a convincingly compact, efficient power pack for drive systems,” said Warth. The technology toolkit for range extender engines is also supplemented by specially developed engine components such as pistons and valves. In the WLTP (Worldwide Harmonized Light Vehicles Test Procedure), enormous ranges of up to 1,350 km can be achieved, depending on the vehicle and the battery size.

Thermal management module boosts efficiency and range

MAHLE has developed a new thermal management module that boosts the system efficiency of an electric vehicle and therefore also the range available with a battery charge. MAHLE is showcasing the product as a world premiere at IAA Mobility. As the central interface for the entire cooling and refrigerant cycle of the vehicle it ensures that each component of the drive and energy storage system is maintained at the right temperature at all times under all climate conditions at the same time as ensuring a comfortable climate in the passenger compartment.

Especially heating the passenger compartment in the winter is a challenge with electric vehicles. As an electric drive system generates significantly less heat than an internal combustion engine, very little energy from this source is available for heating. The heat required for the passenger compartment must be generated in addition to the operation of the drive system. High efficiency is essential as the energy storage facility of the vehicle is the traction battery. Energy used for heating is not available for propulsion.

To ensure maximum range per battery charge even when heating is needed in the winter, MAHLE has integrated a high-efficiency heat pump in the thermal management module. The module combines air conditioning compressor, heat exchanger, refrigerant pumps, sensors and valves in a single unit. This reduces space requirements, development work and costs. In addition, the overall system is considerably more efficient, allowing the range to be boosted by up to 20 percent compared with a system using electric heaters.

“The advantage of MAHLE in our competitive environment is our comprehensive components and systems expertise developed through our in-house development and production activities. This way, we can offer holistic solutions which are perfectly harmonized with each other,” said Marco Warth.

The module is designed for R1234yf, the refrigerant currently used, but can also be operated with the alternative future refrigerant R290 (propane) with minor modifications. “This provides automakers with security for the future when integrating the system in current vehicle platforms as extensive design modifications will not be needed to change the system over to the new refrigerant,” Warth explained. Thanks to the modular, compact system design, only three refrigerant pumps instead of four will be needed for the vehicle. The system is currently being developed and series production will start within the next two years.

Bionic radial blower – form follows nature

At IAA Mobility, MAHLE is showcasing as a European premiere a ground-breaking radial blower for automotive air conditioning systems that boosts efficiency at the same time as significantly reducing noise levels. This product has been developed especially for vehicles with challenging installation space conditions and takes nature as its model. The aerodynamic shape of the blower blades is inspired by the flippers of a penguin, which glides nimbly and rapidly through the water.

Thanks to its innovative design, the bionic blower is four decibels (dB) or 60 percent quieter than a conventional component. At the same time, its efficiency is improved by about 15 percent as the motor requires less energy as a result of the optimized design. MAHLE is setting new standards with this innovative design. The bionic radial blower can be used in all types of passenger cars as well as light and heavy commercial vehicles.

The development process was considerably accelerated by the use of an in-house AI tool and the first prototypes were produced within a very short space of time. The engineers at MAHLE call this process, in which they guide the AI system and feed it with data and information, “superhuman engineering”. This process created more than 30 million virtual designs in a very short space of time.

Ethanol engine – MAHLE is ready for sustainable fuels

MAHLE underscores its technology diversity in the drive system sector with components for internal combustion engines that can be operated on renewable fuels. Life cycle analyses have shown that carbon dioxide emissions can be reduced by up to 70 percent in operation on pure ethanol (E100).

With a new system consisting of pistons, piston pins and rings, called a “power cell unit”, as well as valve sets, MAHLE has taken into consideration the special requirements for ethanol operation. The optimization of components within the overall system ensures minimum lubricating oil consumption with high resistance to wear, corrosion and thermal stress. The benefits are lower greenhouse gas emissions and the conservation of valuable resources. In addition, the power cell unit allows fuel savings of up to 1.5 percent. This convincingly demonstrates that there is still potential for improvement even after more than 100 years of engine development and that CO_2 savings can be achieved.

Note for journalists: This press release and the accompanying photo material can be found at https://newsroom.mahle.com/press/en/

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IAA world premiere: The range extender system from MAHLE consists of a highly efficient high-voltage generator driven by a small internal combustion engine.

IAA world premiere: The new thermal management module from MAHLE with integrated heat pump allows 20 percent more range for electric vehicles.

MAHLE's power cell unit designed for E100 operation reduces fuel consumption and carbon dioxide emissions.

IAA European premiere. The flippers of a penguin were the model for the aerodynamic, slightly curved shape of the blades of the bionic radial blower for automotive air conditioning systems.

Arnd Franz, Chairman of the Management Board and CEO of MAHLE

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About MAHLE

MAHLE is a leading international development partner and supplier to the automotive industry with customers in both passenger car and commercial vehicle sectors. Founded in 1920, the technology group is working on the climate-neutral mobility of tomorrow, with a focus on the strategic areas of electrification and thermal management as well as further technologies to reduce carbon emissions, such as fuel cells or highly efficient, clean combustion engines that also run on renewable fuels, such as hydrogen. Today, one in every two vehicles globally is equipped with MAHLE components.

MAHLE generated sales of €11.7 billion in 2024. Employing just under 68,000 people at 135 production locations and 11 technology centers, the company is represented in 28 countries. (as at: 12/31/2024)

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