

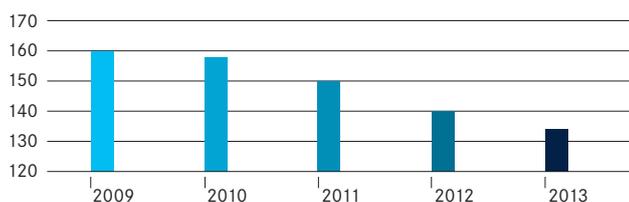
Five new assistance systems in the Mercedes-Benz

Sprinter. One of the main activities during the development of the new Sprinter was the creation of a whole series of new assistance systems, including world firsts for the van segment. Among the systems premiered are Crosswind Assist, COLLISION PREVENTION ASSIST, Blind Spot Assist, Highbeam Assist and Lane Keeping Assist. The many new assistance systems underscore Mercedes-Benz Vans' role as a safety technology pioneer and a driving force for innovation. Crosswind Assist is a milestone in safety technology. Within the limits of what is physically possible, the system almost completely offsets the effects that gusts of wind have on the vehicle. It greatly reduces driver stress, as motorists no longer have to steer as much against sudden gusts of wind. Crosswind Assist uses the standard-fitted ESP[®] sensors to determine the force exerted by crosswinds and gusts on the vehicle. To counteract this force, the assistance system brakes specific wheels on the windward side of the van. This causes the vehicle to steer in the direction of the wind and prevents it from drifting, which would have dangerous consequences.

C.42

Average CO₂ emissions of the new car fleet of Mercedes-Benz Cars in the EU

CO₂/km



Environmental protection

A comprehensive approach to environmental protection.

Daimler is strongly committed to improving the environment and the quality of life in the geographic locations and social settings in which we operate. Protecting the environment is a primary corporate objective of the Daimler Group. Environmental protection is not separate from other objectives at Daimler; instead, it is an integral component of a corporate strategy aimed at long-term value creation. For Daimler, a focus on the highest possible product quality includes compliance with stringent environmental standards and the sparing use of vital natural resources. Our measures for manufacturing environmentally friendly products therefore take the entire product lifecycle into account – from design, production and product use all the way to recycling and disposal. The environmental and energy-related guidelines approved by the Board of Management define the environmental and energy-related policy of the Daimler Group. This expresses our commitment to integrated environmental protection that begins with the underlying factors that have an impact on the environment, assesses the environmental effects of production processes and products in advance, and takes these findings into account in corporate decision-making.

€2.9 billion for environmental protection. In 2013, we continued to energetically pursue the goal of conserving resources and reducing all relevant emissions. We have kept a close eye on the effects of all our processes, ranging from vehicle development and production to recycling and environmentally friendly disposal. We increased our expenditure for environmental protection by 4% to €2.9 billion in 2013.

Further reduction of CO₂ emissions from cars. Mercedes-Benz made intensive efforts early on to reduce the fuel consumption of its vehicles while enhancing their performance – and thus increasing driving enjoyment and safety margins. With a fleet average of 134 g/km (2012: 140 g/km), we once again significantly reduced the average CO₂ emissions of the cars we sell in the European Union in 2013. More than 50 Mercedes-Benz models emit less than 120 g CO₂/km, and over 100 models bear the energy efficiency label A+ or A. [↗ C.42](#)

One example of these models is the E 220 BlueTEC BlueEFFICIENCY Edition¹. With emissions of 114 grams of CO₂ per kilometer, it is not only the most efficient vehicle in its segment but also conforms to the Euro 6 emissions standards. Consequently, it is ranked in the best efficiency class: A+. The E 300 BlueTEC Hybrid² emits even less CO₂. This car combines a 150-kW four-cylinder diesel engine with a 20-kW electric motor and consumes only 4.1 liters/100 km on average (NEDC combined). That corresponds to CO₂ emissions of 107 grams per kilometer.

1 E 220 BlueTEC BlueEFFICIENCY Edition: fuel consumption in l/100 km urban 5,6 – 5,4 / extra-urban 4,1 – 3,7 / combined 4,6 – 4,4; CO₂ emissions in g/km combined 122 – 114.

2 E 300 BlueTEC HYBRID: fuel consumption in l/100 km urban 4,2 – 4,2 / extra-urban 4,2 – 4,1 / combined 4,2 – 4,1; CO₂ emissions in g/km combined 110 – 107.

Innovative technologies for locally emission-free mobility will enable us to further reduce the fuel consumption and CO₂ emissions of our vehicles. Our goal is to reduce the CO₂ emissions of our new-vehicle fleet in the European Union to 125 g/km by 2016. We have also continuously reduced the pollutant emissions of our cars in recent years: by more than 80% since 1995 and by 23% in the past five years. We have achieved even more dramatic reductions with our BlueTEC diesel cars. Thanks to BLUETEC technology, we are a world leader for diesel vehicles. Automobiles equipped with this technology conform to the strictest emissions standards and are the cleanest diesel cars in the world. Moreover, the percentage of our new cars equipped with state-of-the-art Euro 6 technology is significantly higher than that of any other manufacturer.

Economical and low-emission commercial vehicles.

We have also continuously reduced emissions of CO₂ and other pollutants from our commercial vehicles in recent years. Along with the introduction of BLUETEC technology, these reductions have been achieved through more efficient new engines, axle ratios better suited to specific needs, and improvements in tires and aerodynamics. Daimler is the first manufacturer to offer its entire European product range in a Euro VI version. This development began in 2011 with the launch of the new Actros for long-distance road haulage. It was followed in 2012 by the Antos for heavy-duty distribution transportation. In 2013, we introduced the Arocs for the construction sector and the Atego for light-duty distribution transportation. We completed our Mercedes-Benz Trucks product offensive with the Mercedes-Benz Unimog and Mercedes-Benz Econic special vehicles, which have been rolling off the assembly line in Würth equipped with BLUETEC 6 technology since the fourth quarter of 2013. Despite complex exhaust-gas aftertreatment, our new Euro VI engines consume up to 4% less fuel than the predecessor Euro V engines. We are also leading the way with the introduction of the latest exhaust technology in the bus sector. All Mercedes-Benz and Setra model series are now available with Euro VI technology. In 2013, we also set a new benchmark for fuel efficiency on the North American truck market with the launch of our new heavy-duty Freightliner Cascadia Evolution. Thanks to its new Detroit DD15 engine equipped with proven Daimler BLUETEC exhaust technology and its improved aerodynamics, the new heavy-duty truck consumes 7% less fuel than the predecessor model. This was measured and confirmed by an independent agency in the course of a one-week test drive across the United States.

Hybrid technology can also greatly reduce the consumption of diesel fuel – particularly in buses and in commercial vehicles used for distribution transportation. For example, the FUSO Canter Eco Hybrid consumes up to 23% less fuel than a comparable diesel truck, depending on use, and the Freightliner M2e Hybrid consumes up to 30% less fuel than a conventional diesel-powered M2 106. No other commercial vehicle manufacturer has more experience or has done more testing in the areas of alternative drive systems and electric mobility. We also have the most extensive lineup of series-production vehicles in this field, ranging from vans and trucks to buses. On the road worldwide, there are more than 1.2 million environmentally friendly Daimler commercial vehicles equipped with SCR technology, as well as a further 21,000 vehicles with alternative drive technology.

In Europe, we aim to reduce the fuel consumption of our truck fleet by an average of 20% between 2005 and 2020. Compared with the year 2005, we already achieved a reduction of 10% in fuel consumption and CO₂ emissions with the launch of the new Actros model series in 2011, and we are working systematically on achieving the next 10%.

First series-produced Euro VI-compliant regular-service bus.

The new Mercedes-Benz Citaro is the first regular-service bus with engines that conform to the Euro VI emissions standards to go into series production significantly in advance of the new emission standards. The emissions of a Citaro equipped with Euro VI exhaust technology have been reduced by about 80% compared to those of its predecessors, which significantly improves the quality of the urban environment. At the same time, fuel costs for bus operators are being reduced, because the new city buses consume around 8% less diesel fuel. Economy is improved through an intelligent combination of an all-new engine generation and the supply of power to auxiliary systems from an energy recovery module. By the end of 2013, approximately 1,200 Mercedes-Benz and Setra buses equipped with environmentally friendly Euro VI exhaust technology had already been delivered to customers.

FUSO Canter Eco Hybrid and Daimler FleetBoard receive sustainability award.

Daimler Trucks was presented with the “European Transport Award for Sustainability 2014” for two of its products in November 2013. This international award is given by the editors of “Transport,” the newspaper for the freight transport sector. Representatives from business, research and the media make up the seven-member panel that judged the applications submitted. The panel members made their choices based on the criteria of economy, environmental impact and social responsibility. The FUSO Canter Eco Hybrid won by a sizable margin in the category “Distribution transportation truck up to 12 tons.” The truck’s great economy is due to its highly efficient enhanced drive technology. The Global Hybrid Center in Japan developed a parallel hybrid architecture in which a supplementary electric motor is located between the clutch and the transmission. The FUSO Canter Eco Hybrid’s drive technology is based on this architecture. The new Canter Eco Hybrid’s operating strategy is to start moving using only the electric drive. This also makes it very quiet. The diesel engine engages at a speed of around ten kilometers per hour. Depending on how much power is needed, the electric motor also supports the diesel engine for acceleration at higher speeds.

The Daimler FleetBoard consulting service was awarded first prize in the category “Driver and transportation management systems.” Many transport companies use the FleetBoard consultants to sustainably integrate telematics and transport management into the existing IT landscape and thus improve their transportation processes. Moreover, FleetBoard helps its clients to permanently cut fuel consumption and reduce wear and tear by adopting an efficient driving style. Taken together, these measures make a company’s operations noticeably more sustainable. In this way a smaller CO₂ footprint is achieved along the entire logistics chain.

The world's most modern wind tunnel. Through a variety of improvements, we have substantially reduced the noise produced by our cars, trucks and buses – and we plan to reduce it further in the future. The new aeroacoustic wind tunnel in Sindelfingen is helping us reach that goal. This facility, which occupies 4,200 square meters and went into operation in 2013, is setting new standards in flow quality and metrology. In the aeroacoustic wind tunnel, we carry out measurements of air resistance, acoustic properties and flow fields at simulated speeds of up to 265 km/h. The testing done at this new facility provides the foundation for reducing the air resistance of our vehicles, and as a result their fuel consumption and CO₂ emissions. This testing also provides information about how to prevent wind noise at high speeds – an important consideration when it comes to comfort.

Mercedes-Benz is the pacesetter in the field of aerodynamics, and in almost every vehicle class we make the cars with the best aerodynamic values. Some of the latest examples are the CLA, which has a drag coefficient (cd) of 0.22 – the lowest in the world for a series-production vehicle – and the new S-Class, which has a cd value of 0.23.

Lower weight, more recyclates and more natural materials. We want to make our vehicles lighter while further reducing the environmental impact of the materials used in their production. To achieve these goals, we are using new lightweight materials and components. In addition, we are increasingly using renewable resources and recycled materials.

Lightweight construction can reduce the weight of a vehicle without compromising safety and comfort. Material selection, component design and manufacturing technology all play key roles in lightweight engineering. Not every material is suitable for every component. At 35%, the bodywork accounts for the largest portion of a vehicle's total weight. After that comes the running gear at 25%, the comfort and safety equipment at 20%, and the engine and transmission also at 20%. This distribution means that the most effective way to reduce vehicle weight is to focus on the body. So instead of using conventional types of steel, we are increasingly employing high-strength and ultra-high-strength alloys in our bodywork. Lightweight engineering in the new S-Class has enabled us to make improvements in the body and other components that have reduced the vehicle's weight by almost 100 kilograms compared with the previous model.

Carbon dioxide as a future refrigerant. The debate about refrigerants for cars' air conditioning was at the focus of public interest for several months in 2013. The only currently available refrigerant that meets the legal limits is a chemical compound by the name of R1234yf. The safety risks connected with that refrigerant that Daimler has identified in several tests ultimately led to the decision to use the safe and environmentally friendly refrigerant CO₂ in the future. CO₂ is neither flammable nor toxic and it cools very quickly. We are therefore working hard on the development of CO₂ air conditioning. Until the new technology is ready for application, Daimler will continue to use the refrigerant R134a with its proven safety properties, like most of the other automobile manufacturers. According to an EU directive, this is allowed until the end of 2016, depending on the date and other details of a vehicle's type approval. All models of the Mercedes-Benz and smart brands have the relevant type approval with Europe-wide validity.

Extensive recyclability of old vehicles. To make our vehicles more environmentally friendly, we are reducing our automobiles' emissions and the resources they consume over their entire lifecycle. We therefore pay close attention to creating a recycling-friendly design even at the development stage. Up to 85% of the materials in all Mercedes-Benz models are recyclable and as much as 95% of the materials are reusable.

Other proven elements of our recycling concept are the resale of inspected and certified used parts, the reconditioning of parts that have been replaced, and the workshop disposal system MeRSy Recycling Management.

Avoiding waste. In the area of waste management, Daimler believes that recycling and the prevention of waste are better than disposal. Accordingly, the reconditioning and reuse of raw, process and operating materials has been standard practice at our plants for many years. In order to avoid the creation of waste from the outset, we use innovative technological processes and environmentally aware production planning. Waste materials that are unavoidable are generally recycled. As a result, the recycling rate for waste at our plants is over 90% on average. At some plants almost 100% of the waste is now recycled, meaning that waste destined for landfills has been almost completely eliminated.

As we pursue our environmental protection activities, we rely on comprehensive environmental management systems. Today, more than 98% of our employees worldwide work in plants whose environmental management systems have been certified as conforming to the ISO 14001 or EMAS environmental standards.

Extensive measures for environmental protection in production. In recent years, we have been able to limit the energy consumption, CO₂ emissions, production-related solvent emissions and noise pollution at our plants with the help of environmentally friendly production processes. As a result, energy consumption during the period from 2008 to 2013 increased at a rate of 1.2% to 11.1 million megawatt-hours, which was well below the rate of production growth. Thanks to a transition to lower CO₂ energy carriers and more efficient energy generation, CO₂ emissions decreased during the same period by 11.2% to a total of 3.4 million tons. With our ongoing energy savings projects, we were also able to at least partially compensate for the additional energy consumption that resulted from the significant increase in production and the ramp-up of two new plants, one in India and one in Hungary. The increase in energy consumption compared with the previous year was therefore disproportionately low at 2.7%, and CO₂ emissions were at the level of the prior year. With resource-conserving technology such as circulation systems, we kept our water consumption stable between 2008 and 2013, despite significant growth in production.