

# Climate protection

## Materiality and goals

GRI 103-1/-2

Targets	Target horizon	Status as of 2021
<b>Climate protection as it relates to our vehicles and services</b>		
Mercedes-Benz offers battery electric vehicles (BEVs) in all the divisions in which the brand is represented.	2022	10 models
We increase the share of plug-in hybrids and all-electric vehicles to as high as 50 per cent.	2025	12 per cent
All new vehicle architectures are exclusively electric.	2025	According to plan
Customers are offered the choice of at least one all-electric vehicle in every segment.	2025	According to plan
The CO <sub>2</sub> emissions of Mercedes-Benz's fleet of new vehicles are reduced by more than 40 per cent. <sup>1</sup>	2030	According to plan
Mercedes-Benz is all-electric — wherever market conditions allow.	By the end of this decade	According to plan
A fleet of new Mercedes-Benz vehicles that are CO <sub>2</sub> neutral along all stages of the value chain.	2039	According to plan
<b>Climate protection in the supply chain</b>		
Mercedes-Benz plans to procure only CO <sub>2</sub> neutral production materials.	2039	89 per cent of all suppliers <sup>3</sup>
<b>Climate protection in production</b>		
The manufacturing operations in our Mercedes-Benz production plants are CO <sub>2</sub> neutral worldwide.	2022	According to plan
Mercedes-Benz to reduce CO <sub>2</sub> emissions at its plants (Scope 1 and 2) by 50 per cent. <sup>2</sup>	2030	85 per cent <sup>4</sup>

<sup>1</sup> Compared to 2018 and pertaining to the use phase (🔗 [well-to-wheel](#)); corresponding to the target of the 🔗 [Science Based Targets initiative \(SBTi\)](#).

<sup>2</sup> Compared to 2018. This target has been confirmed by the Science Based Targets initiative (SBTi).

<sup>3</sup> Measured on the basis of the annual procurement volume and assured by signature.

<sup>4</sup> Target achievement level

About one fifth of all greenhouse gas emissions in Europe are produced as a result of the transport of people and goods on streets and roads. The Mercedes-Benz Group is taking deliberate measures to counteract this trend and has made climate protection a core element of its business strategy. Our goal is to make our entire new vehicle fleet CO<sub>2</sub> neutral across all stages of the value chain by 2039.


In order to achieve this goal, we are transforming the products and services that are at the heart of our business operations. We are thus creating innovative, noticeably more sustainable solutions in order to live up to our social responsibility and at the same time reinforce people's trust in the Mercedes-Benz brand.

That's because sustainability is one of the brand promises of Mercedes-Benz.

This principle will continue to drive our actions in the future, not only with regard to our strategic brand decisions but also for our direct contact with customers. We want to enable our customers to experience sustainability at every point of contact with us. We are promoting climate protection with equal ambition in all upstream and downstream phases of the automotive life cycle — from the supply chain and our own manufacturing operations to the use and disposal of the vehicles.

In October 2020 Mercedes-Benz AG signed 🔗 [The Climate Pledge](#). The Climate Pledge, is a voluntary

commitment to fulfil the goals of the Paris Agreement on climate change ten years earlier than prescribed. Companies are called on to become CO<sub>2</sub> neutral by 2040. By joining this initiative we reaffirmed our intention to continue moving systematically towards emission-free mobility and sustainable vehicle production.

In July 2020 Mercedes-Benz AG also became a founding member of the international climate protection initiative Transform to Net Zero, which was launched by Microsoft. Through this membership we have further reinforced our commitment to the goals mentioned above. Nine renowned companies from diverse sectors and countries of origin are pooling their expertise in this initiative. Our shared goal is to improve the framework conditions for the  **decarbonisation** of the economy and society all over the world.

# Climate protection as it relates to our vehicles and services

## Strategy and concepts

### Reduction of CO<sub>2</sub> emissions from road traffic

GRI 103-1

For the Mercedes-Benz Group, the Paris Agreement represents more than just an obligation; our commitment to its targets stems from our fundamental convictions. We believe that it is our mission to contribute to CO<sub>2</sub> neutral mobility around the world.

With respect to CO<sub>2</sub> emissions from road traffic, EU legislation focuses on reducing the emissions of new vehicles, for which it defines concrete targets. According to the proposed European Commission regulation that was published in July 2021, the CO<sub>2</sub> emissions of cars are to be reduced by 55 per cent (previously 37.5 per cent) by 2030 compared to the base year of 2021. The CO<sub>2</sub> reduction requirement for 2025 will stay at 15 per cent relative to 2021. The proposed legislation also states that the average CO<sub>2</sub> emissions should be 0 g CO<sub>2</sub>/km in 2035.

The Mercedes-Benz Group realises that achieving this target will require a high level of investment. In order to finance it, we intend to increasingly use new tools such as [Green Bonds](#) in the future. Green bonds offer environment-oriented investors the opportunity to directly participate in the implementation of our technological strategy. However, the broad-based success of low-emission mobility requires not only sustainable investment but also the corresponding framework conditions. From our current perspective, we need ambitious CO<sub>2</sub> pricing systems for fossil fuels and the creation of a comprehensive charging infrastructure as well as a hydrogen filling station network.

### On the road to a climate-neutral future

In order to achieve its long-term climate-protection goal of becoming CO<sub>2</sub> neutral by 2039, Mercedes-Benz is planning the complete electrification of its product range. By the end of this decade, Mercedes-Benz wants

to be all-electric wherever market conditions allow. This strategic step from electric-first to electric-only will accelerate the transformation of Mercedes-Benz to an emission-free, software-driven future. We underscored this fact during the UN Climate Change Conference in Glasgow in November 2021, when we signed the [COP26 Declaration on accelerating the transition to 100 per cent zero-emission cars and vans](#). In the declaration, the Mercedes-Benz Group was the only German automaker to confirm that it is working to offer only emission-free cars and vans in leading markets from 2035.

Mercedes-Benz's Ambition 2039 strategy aims not only to help make the world climate-neutral but also to get our customers enthusiastic about such a climate-neutral future. For many customers, it's important that the products they use do not impact the environment and that they do not have to make any compromises while using these products in their daily life. With its product range, Mercedes-Benz wants to fulfil both of these customer requirements.

## Environmental aspects during product development

GRI 103-2

Mercedes-Benz has set itself the goal of developing products that are especially environmentally friendly and energy-efficient in their respective market segments. Our environmental and energy guidelines define how we intend to reach this goal. Product development plays a key role in this regard: a vehicle's environmental impact — including its emissions of CO<sub>2</sub> and pollutants — is already largely determined during the first phases of its development. The earlier in the development process we take environmental aspects into account, the more efficiently we can minimise the environmental impacts of our vehicles.

## Making life cycle assessments

GRI 305-1/-/2/-3

In order to evaluate the environmental compatibility of a vehicle, Mercedes-Benz carries out life cycle assessments. We systematically examine a vehicle's CO<sub>2</sub> emissions and other environmental effects throughout its entire life cycle — from the extraction of raw materials and vehicle production to product use and recycling. Among other things, these analyses have made it clear that as more and more vehicles are electrified, the focus is shifting towards other factors, such as the production of the high-voltage battery and the generation of the electricity for charging the battery. Beginning with the EQS, battery cells are produced with CO<sub>2</sub> neutral electricity and the Group is promoting battery charging with electricity from sustainable sources.

➤ [Life cycle assessment of the EQS 450+](#)

We record and publish the key figures for the life cycle assessments in line with the basic principles of the [Greenhouse Gas \(GHG\) Protocol](#).

We correspondingly divide our greenhouse gas emissions into three categories called the Greenhouse Gas Scopes. Scope 1 comprises all the emissions we cause ourselves through the combustion of energy carriers at our production locations, such as the generation of electricity and heat in our own power plants. Scope 2 includes all emissions that are due to external providers from whom we purchase energy in forms such as electricity and district heating. Scope 3 includes all the emissions that are generated before (upstream of) or after (downstream of) our business operations. For example, Scope 3 includes the CO<sub>2</sub> emissions that arise in the supply chain (purchased goods and services), as a result of our vehicles' operation in customers' hands (the use phase, including the production of fuel and electricity), or in the recycling phase of the vehicles.

The GHG Protocol specifies a total of 15 categories of Scope 3 emissions. The emissions are determined on the basis of comprehensive methodological considerations and complex calculations. Most (approximately 80 per cent) of our reported Scope 3 emissions are generated during the use phase — in other words, during the production of fuel, and the generation of electricity ([well-to-tank](#)) and the driving operation of our products ([tank-to-wheel](#)). About 17 per cent of our

indirect Scope 3 emissions are due to the supply chains that provide us with goods and services.

We determine the CO<sub>2</sub> emissions of our vehicles in the use phase on the basis of our worldwide sales figures and the fleet's average normalised CO<sub>2</sub> emissions figure. For this calculation, we assume that each vehicle travels 20,000 kilometres per year. We also assume that each car is used for a period of ten years. The average total mileage thus amounts to 200,000 kilometres per vehicle.

At the moment, it is safe to assume that Scope 3 reporting will play an important role in the struggle to limit climate change in the future. We expect that this will create more transparency and trigger a competition among CO<sub>2</sub> emitters to develop the most effective way to limit the greenhouse gases that are damaging the climate.

➤ [Scope 1-, Scope 2- and selected Scope 3-CO<sub>2</sub> emissions in tons per vehicle Mercedes-Benz Cars & Vans](#)

➤ [Scope 1, 2 and 3 emissions worldwide Mercedes-Benz Cars & Vans](#)

## Responsibilities

GRI 103-2

Corporate management is responsible for setting strategic goals, including targets for reducing our CO<sub>2</sub> emissions, and for monitoring the progress made in achieving these goals. The Product Steering Board (PSB) is responsible for monitoring the development of the CO<sub>2</sub> emissions of the car fleet in markets in which such emissions are regulated. It is also responsible for providing forecasts. The CO<sub>2</sub> Project and Steering Committee (CO<sub>2</sub> PSC) does the same for the van fleet. In their evaluations, these bodies take into account a variety of factors, including the increasing degree of vehicle electrification and the changes that have been made to legal requirements, for example those related to the introduction of the new [WLTP](#) certification procedure. The PSB is assigned to the Committee for Model Policy and Product Planning, while the CO<sub>2</sub> PSC is assigned to the Van Executive Committee. They report directly to the Board of Management of Mercedes-Benz Group AG. On the basis of these reports, the Board of Management then decides on the requisite measures. In the short term, market-related measures for controlling prices and volumes can also have an impact on

the achievement of CO<sub>2</sub> targets. For this reason, these measures are also discussed with the Board of Management within the framework of the regular reporting on the current state of [CO<sub>2</sub> fleet compliance](#).

The primary responsibility for ensuring compliance with climate protection requirements is split between several units and Board of Management members. The development units of the vehicle divisions are responsible at the vehicle level. For cars and vans, these are the “Drive Systems Product Group” development unit, the product groups of the vehicles and Mercedes-Benz Vans Development. The Board of Management of Mercedes Cars & Vans is responsible for the production plants and the company-owned sales and service outlets. Mercedes-Benz Group AG monitors the implementation within the framework of its Group management.

### **An interdisciplinary team is working on achieving CO<sub>2</sub> neutrality**

At Mercedes-Benz Cars & Vans, an interdisciplinary team consisting of environmental experts, buyers, developers, logistics specialists, production specialists, strategists and sales experts is working to make our new-car fleet CO<sub>2</sub> neutral by 2039. This team monitors the CO<sub>2</sub> emissions and manages the measures for reducing them.

The Corporate Environmental Protection unit, for example, calculates the CO<sub>2</sub> emissions of all model series and all drive types at Mercedes-Benz Cars & Vans and conducts environmental and life cycle assessments for the vehicles. The Procurement unit at Mercedes-Benz is working together with around 2,000 tier 1 suppliers in order to also make the supply chain CO<sub>2</sub> neutral. Our logistics experts are addressing the emissions caused by the delivery of goods, sales operations and shipments to distribution hubs. Their goal is to avoid shipments as much as possible and to optimise routes and transport systems. The teams are also applying additional measures for achieving CO<sub>2</sub> neutrality in areas such as production and customer-specific charging concepts.

The majority of the CO<sub>2</sub> emissions in the life cycle of a vehicle are generated during the use phase, i.e. while driving. That's why the teams are supplemented by CO<sub>2</sub> strategists who specialise in tank-to-wheel emissions.

They analyse how much CO<sub>2</sub> our vehicles actually emit out on the road. This information, in turn, provides the basis for reducing CO<sub>2</sub> emissions.

## **Measures**

### **More environmentally friendly product development**

Mercedes-Benz systematically tests the environmental friendliness of future products.

An important tool in this process is the ongoing documentation of the development process. Here we define specific characteristics and target values — for example, for fuel consumption and pollutant emissions that must be achieved for every vehicle model and every engine variant. We also use these target values to assess the progress we make in the course of product development and implement any corrective measures that may be necessary.

### **An all-electric product range**

We want to accelerate the pace at which we are expanding our range of electric vehicles. Our research and development work is correspondingly vast and between 2022 and 2026 we want to invest a total of over €60 billion in the transformation to an emission-free and software-powered future. In this way, we are continuously expanding the portfolio of Mercedes-Benz with further models. Mercedes-Benz also offers a wide variety of transport solutions that do not produce local emissions for the commercial vans sector.

In addition, Mercedes-Benz Mobility's Green Mapping concept is helping to transform transport into electric mobility. Since late 2020, customers who have leased or financed their Mercedes from Mercedes-Benz Mobility AG have been able to switch from a combustion-engine vehicle to a hybrid or an electric one without any change in their monthly payments. At the end of 2021, Green Mapping was employed in twelve markets.

## Alternative drive systems at Mercedes-Benz Cars<sup>1</sup>

		2020	2021
Worldwide	Hybrid	115,191	178,526
	Electric drive	47,672	90,082
	Alternative drive systems (total)	162,863	268,608
	<b>MBC unit sales (total)</b>	<b>2,202,579</b>	<b>2,093,476</b>
Europe	Hybrid	91,427	135,431
	Electric drive	37,013	64,966
	Alternative drive systems (total)	128,440	200,397
	<b>MBC unit sales (total)</b>	<b>626,655</b>	<b>548,960</b>

<sup>1</sup> Retail unit sales Mercedes-Benz Cars (incl. V- and X-Class)

## Alternative drive systems at Mercedes-Benz Vans<sup>1</sup>

		2020	2021
Worldwide	Electric drive	4,519	9,216
	<b>MBV unit sales (total)</b>	<b>325,771</b>	<b>334,165</b>
Europe <sup>2</sup>	Electric drive	3,229	7,074
	<b>MBV unit sales (total)</b>	<b>180,754</b>	<b>179,601</b>

<sup>1</sup> Retail unit sales Mercedes-Benz Vans (commercial)

<sup>2</sup> Vans that are registered as passenger cars + light commercial vehicles (class N1 vehicles)

## EQ models: future-oriented and battery-powered

Since 2018 we have been offering battery-powered automobiles under the Mercedes-EQ brand. We are continuously expanding this brand's portfolio through the addition of more models.

In August 2021, our Cars division launched the first all-electric luxury EQS sedan on the car market. The EQS 450+ (WLTP: combined electrical consumption: 19.8–15.7 kWh/100 km; combined CO<sub>2</sub> emissions: 0 g/km) has a range<sup>1</sup> ([according to WLTP](#)) of up to 784 kilometres. The all-electric EQS is the company's first automobile whose structure is not derived from that of a combustion engine model, but instead based on a modular electric architecture: the wheelbase, the track and many other system components (especially the batteries) are variable due to the modular system. This enables them to be used on any scale and for any model. As a result, the vehicle concept is designed to fulfil all of the requirements for a family of battery-powered luxury

and upper-range models. The EQE business sedan and the EQS and EQE SUV variants are to be followed by additional models equipped with the modular electric architecture.

Our EQA offers all-electric driving for the compact class. Smart assistants support the driver in many areas, including accident avoidance, an anticipatory, efficient operation and navigation with [Electric Intelligence](#).

As a seven-seater<sup>2</sup>, the new EQB offers room for a variety of family constellations and many different transport requirements. Moreover, it combines design elements that are typical of the Mercedes-EQ with a distinctive angular appearance. In Europe, the EQB 350 4MATIC (WLTP: combined electrical consumption: 19.2–18.1 kWh/100 km; combined CO<sub>2</sub> emissions: 0 g/km) has a WLTP-range<sup>1</sup> of up to 419 km.

The EQV is the first MPV from Mercedes-EQ with a purely battery electric drive system that enables it to drive

<sup>1</sup> Electricity consumption and range were determined on the basis of Regulation (EU) 2017/1151.

<sup>2</sup> The two seats in the third row can be used by people up to 1.65 metres tall.

locally emission-free. The EQV 300 (NEDC: combined electrical consumption: 27.1–26.3 kWh/100 km; combined CO<sub>2</sub> emissions: 0 g/km)<sup>1</sup> has a WLTP-range<sup>2</sup> of up to 363 kilometres. In addition, the EQV is integrated into a digital environment that combines intelligent navigation with active range management and cloud-based services and apps. In 2022, it is to be followed by an all-electric small van with up to seven seats for families and people who enjoy leisure activities.

### **Plug-in hybrids for reliable ranges**

🔗 **Plug-in-hybrids** are an important transitional technology on the road to CO<sub>2</sub> neutral all-electric mobility. Mercedes-Benz offers an efficient drive system package for this purpose. At the end of 2021, customers could choose between more than 20 model variants. This combination of an electric drive system and a combustion engine enables locally emission-free driving. The drive system, which consists of an electric motor and a high-voltage battery, ensures that the vehicle has a purely electrical range sufficient for most daily trips. Ranges of over 70 kilometres (🔗 **WLTP-TML**) are possible in the compact segment and, in some cases, of over 100 kilometres (WLTP-TML) in the luxury segment. Mercedes-Benz wants to gradually roll out this technology across its entire vehicle range — from the A-Class to the S-Class and from the GLA to the GLE.

### **Mercedes-Benz Vans**

Mercedes-Benz Vans wants to continue to play the leading role in electric mobility and has firmly anchored this goal in its strategy by means of the “lead in electric drive” claim. As a result, all of the model series are being systematically electrified. Today, body manufacturers and customers can already choose from three battery-powered vans: the eVito panel van, the eSprinter and the eVito Tourer. The new Citan is also due to become available with a battery-electric drive system in 2022, thus expanding the electric product portfolio of the commercially oriented small van segment.

### **The next-generation eSprinter**

Mercedes-Benz Vans is also systematically implementing its strategy with the next-generation eSprinter. The attributes of this model series were defined in close

cooperation with customers. Three battery and many body variants — from panel vans to a chassis for box bodies — will enable it to penetrate into new customer segments and markets, including the United States and Canada. Depending on the configuration, the range will be more than twice that of the current eSprinter. Production is scheduled to ramp up in stages in Charleston, South Carolina (United States), Düsseldorf and Ludwigsfelde, beginning in the second half of 2023. Mercedes-Benz AG is investing around €350 million in the next-generation eSprinter, whose production is scheduled to be CO<sub>2</sub> neutral.

### **Sustainability and climate protection in urban short-range distribution**

Our technology vehicle SUSTAINER demonstrates how environmentally compatible a van can be. Based on a Mercedes-Benz eSprinter, SUSTAINER combines many innovations that improve the quality of life in cities, preserve the climate and the environment and enhance the safety and health of drivers and other road users. Among other things, the all-electric van has a roof-mounted solar panel that generates green electricity for the vehicle. Under good conditions, this can enable the vehicle to travel 2,500 kilometres per year in Baden-Württemberg, for example.

🔗 **Resource conservation**

### **eVans: all-electric vehicle architecture**

Mercedes-Benz Cars & Vans aims to offer all new vehicle architectures as exclusively electric systems, beginning in 2025. As a result, Mercedes-Benz Vans is also developing a new all-electric vehicle architecture called VAN.EA.

### **Services**

The majority of the CO<sub>2</sub> emissions of automobiles are generated while driving. That's why Mercedes-Benz wants to help the users of its vehicles to drive in a climate-friendly manner and encourage them to purchase locally emission-free vehicles. We offer our customers a variety of services for this purpose.

### **App helps buyers reach a decision**

Is an electric vehicle or a plug-in hybrid right for my daily life? By analysing an individual's driving behaviour, the EQ Ready app supports drivers who are wondering whether it would make sense for them to switch to

<sup>1</sup> Electricity consumption was determined on the basis of Regulation (EC) No. 692/2008.

<sup>2</sup> The range was determined on the basis of Regulation (EU) 2017/1151.



an electric vehicle. For this purpose, Mercedes-Benz “gamifies” the process: users take part in a seven-day challenge, during which they playfully obtain a lot of useful information about electric mobility. In addition to data about their potential energy requirements, users can simulate the duration of different charging solutions in real time and view the various regional charging infrastructures. The app has been available in around 30 countries worldwide since 2020. To date, it has evaluated almost two million trips for its users. Every week, our users analyse 24,000 “green” trips.

The eVan Ready app was developed specifically for commercial users. In addition to the same basic functions of the EQ Ready app, eVan Ready offers many additional features for such users. Among other things, users can check whether they could also use one of our electric vans to drive their routes. The eCost Calculator enables users to find out whether an electric Mercedes-Benz van would be a good option for them from a financial standpoint. Together with the users, we also analyse the charging infrastructure at their respective locations. We also show them what measures are necessary for the efficient operation of individual vehicles as well as large or small fleets.

### **App collects data about individual fuel consumption**

In Europe, Mercedes-Benz AG offers transparent information and ways of comparing the fuel consumption of its vehicles. Since 2020, customers have been able to use the free Mercedes me app to voluntarily determine and anonymously share and compare their fuel consumption data with the drivers of similar vehicles. The app is available for almost all model series. The information can also be viewed at our [website](#). A new feature that was introduced during the reporting year enables visitors of the website to select a vehicle of their choice and view the fuel consumption curves of all of the drivers.

The initial data show that individual fuel consumption figures can be lower or higher than the [WLTP certification value](#). Deviations from the [WLTP cycle](#) may be due to many different factors such as road conditions, loads, weather conditions or, in particular, individual driving styles. In the future we plan to offer individual tips for saving fuel depending on driving style.

### **Saving energy with Eco Coach**

Since the end of 2020, Mercedes-Benz has been offering an app with individual energy savings tips to its customers driving plug-in hybrids and electric vehicles. Called the Mercedes me Eco Coach, this app analyses the user’s driving and charging behaviour and provides personalised tips on how the driver can reduce his or her CO<sub>2</sub> footprint and extend the life of the vehicle’s battery.

We especially use gamified measures to motivate drivers of plug-in hybrids to charge their vehicles more often and thereby reduce their actual fuel consumption and CO<sub>2</sub> footprint. People who use the app get reward points that they can redeem in selected European markets for the offsetting of CO<sub>2</sub> or convert into Mercedes me Charge vouchers.

### **Charging infrastructure**

#### **GRI 203-1**

From today’s perspective, the future of private mobility is electric. To make this possible, the charging infrastructure has to make rapid progress. That’s why Mercedes-Benz is continuously working to make the charging of electricity more convenient, faster and more accessible — at home, at the workplace and in public spaces.

### **Fast and easy charging**

The charging of electric vehicles should be as quick and convenient as possible. To enable this, Mercedes-Benz employs globally standardised processes and a large network of partners, Mercedes me Charge. It is one of the world’s largest charging networks and is continuously expanding. As of January, over 685,000 alternating and direct current charging points worldwide had been integrated. Of these, more than 275,000 are in Europe and over 65,000 in the United States and Canada. In Europe alone, more than 850 different operators of public charging stations have charging points that the customers of Mercedes me Charge can access.

The Mercedes me App and the on-board navigation system show drivers the exact position, current availability and prices at appropriate charging stations. On this basis, our navigation system calculates the optimal route, including stops for charging. At the charging station, the driver is authenticated via the display in the MBUX multimedia system, the Mercedes me app or the



Mercedes me Charge charging card. The customer only has to enter his or her payment method once. Thereafter, each charging process is automatically deducted from the user's bank account, even when it takes place abroad. Each individual charging is collected into a clearly structured invoice every month.

With the launch of the EQS, we introduced a new function, Mercedes me Charge Plug & Charge, which makes handling even easier, because charging, including the payment function, begins as soon as the cable is inserted — an additional authentication step is not necessary. Communication between the vehicle and the charging station takes place directly via the charging cable.

### **More sustainable charging**

In March 2021, Mercedes-Benz launched Green Charging in Europe. Mercedes me Charge enables our customers with EQ models and plug-in hybrids to charge sustainable energy at public charging stations. Green Charging offsets the electricity used during charging by subsequently feeding energy from renewable sources into the grid. Green Charging was launched on the United States and Canadian markets in August 2021.

In the life cycle of an electric vehicle, power from renewable energy sources is a significant factor in the effort to avoid CO<sub>2</sub> emissions. Based on the current EU electricity mix, around 50 per cent of a battery electric vehicle's CO<sub>2</sub> footprint is generated during the use phase and is therefore due to its being charged with electricity whose generation has resulted in the emission of CO<sub>2</sub>. People are often unaware of whether a public charging station offers green electricity or electricity from non-renewable sources. The supply of the charging current is the responsibility of the charging point's operator. Green Charging is an integral part of Mercedes me Charge in order to counteract this lack of transparency and promote the use of electricity from renewable sources.

Green Charging ensures that the corresponding amount of green electricity is fed into the grid after the charging process is finished. For this purpose, it uses proofs of origin that verifiably certify the energy's origins and serve as a kind of birth certificate for electricity from renewable sources. Green electricity is defined by the EKOenergy environmental label and supplied by

certified energy generation systems. In addition, incentives are provided for investing in renewable energy production facilities.

Moreover, it makes customers aware of how their charging behaviour affects their personal CO<sub>2</sub> footprint. Green Charging-compatible charging points are displayed by the vehicle's head unit and the Mercedes me App. The Mercedes me App provides precise figures of the CO<sub>2</sub> reduction achieved during the charging processes. As a result of Green Charging, Mercedes-Benz is the first automaker to offer its customers a proprietary service for the reduction of CO<sub>2</sub> emissions during the use phase.

### **Expansion of the IONITY fast-charging network**

Within the scope of the IONITY joint venture, Mercedes-Benz AG is working to create a high-performance fast-charging network for electric vehicles in Europe. IONITY aims to safeguard private electric mobility by means of a standardised charging network along the most important pan-European motorways with the intention of speeding up the adoption of electric mobility within the market.

Over 400 IONITY fast-charging stations were in operation at the end of 2021. Each charging station has several charging points, all of which are operated with 100 per cent green electricity. The high charging power of up to 350 kW per charging point enables correspondingly designed vehicles to charge their batteries quickly. All of the IONITY charging points are integrated into the Mercedes me Charge system and can be conveniently used by means of Plug & Charge.

In November 2021, the company revealed its IONITY 2.0 growth strategy for the accelerated expansion of its fast-charging network. The strategy aims to increase the number of locations to over 1,000 by 2025. In the future, they will also be located along federal roads and near urban centres. Some locations will also have innovative flagship concepts for making travel more convenient and improving the charging experience. Provided the authorities approve the transaction, the existing shareholders and the new shareholder BlackRock will together invest €700 million for the achievement of IONITY 2.0.

### Charging network: cooperation with Shell

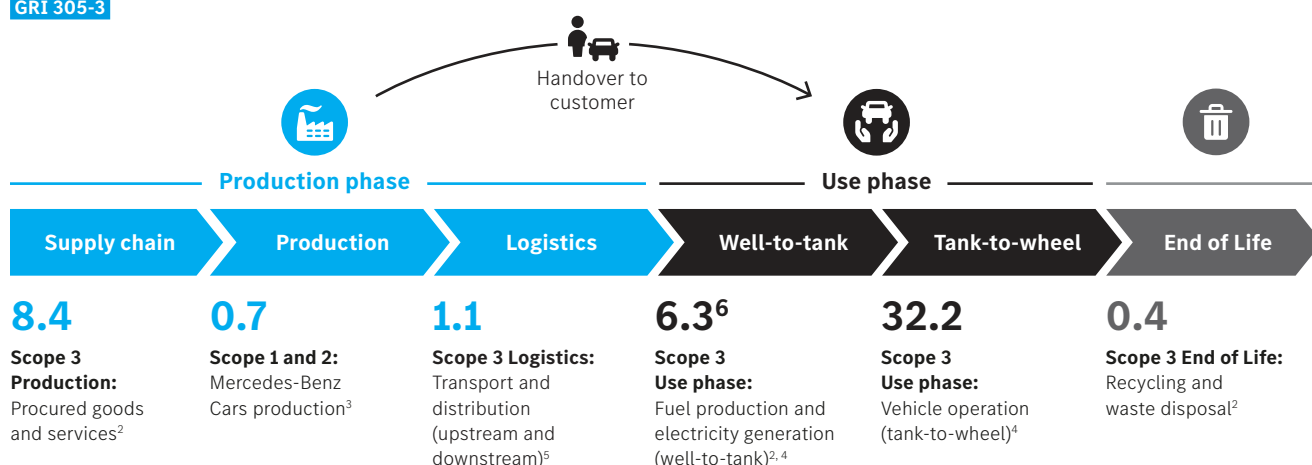
Since July 2021, Mercedes-Benz AG has also been co-operating with the petroleum and natural-gas company Shell to expand its charging network. The aim is to provide the drivers of our electric automobiles with better access to Shell's Recharge network, which is planned to encompass over 30,000 charging points in Europe, China and North America by 2025, including more than 10,000 fast-charging stations.

### Flexible charging system for EQ vehicles and plug-in hybrids

Since August 2021 Mercedes-Benz has been offering a flexible charging system that includes various adapters for household power sockets, industrial sockets and public charging stations and wallboxes. The adapters can be connected to the charging system by means of plug and play. It also incorporates a Type 2 connector that is permanently connected to the system. The vehicle can thus be charged

## Scope 1-, Scope 2- and selected Scope 3-CO<sub>2</sub> emissions in tons per vehicle, Mercedes-Benz Cars (2021)<sup>1</sup>

GRI 305-3



<sup>1</sup> For calculation basis see appendix [7 Calculation and documentation of CO<sub>2</sub> emissions](#) and chapter [7 Making life cycle assessments, 7 Calculation of CO<sub>2</sub> emissions](#)

<sup>2</sup> See [Life cycle assessments of our vehicles](#) and internal life cycle assessment studies

<sup>3</sup> See [7 key figures environment](#)

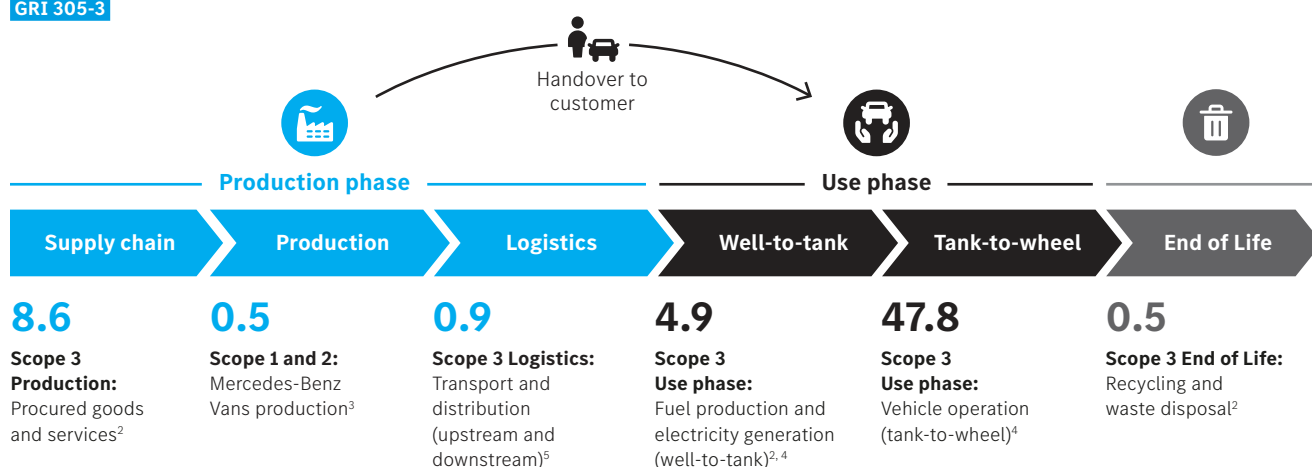
<sup>4</sup> Driving emissions of Mercedes-Benz Cars fleet (EU, China, USA and RoW) standardised, mileage: 200,000 km, for data basis see chapter [7 Development of CO<sub>2</sub> emissions](#)

<sup>5</sup> Forecast value

<sup>6</sup> Incl. Green Charging: Contribution per vehicle -0.03 t CO<sub>2</sub>

## Scope 1-, Scope 2- and selected Scope 3-CO<sub>2</sub> emissions in tons per vehicle, Mercedes-Benz Vans (2021)<sup>1</sup>

GRI 305-3



<sup>1</sup> For calculation basis see appendix [7 Calculation and documentation of CO<sub>2</sub> emissions](#) and chapter [7 Making life cycle assessments, 7 Calculation of CO<sub>2</sub> emissions](#)

<sup>2</sup> Internal life cycle assessment studies

<sup>3</sup> See [7 key figures environment](#)

<sup>4</sup> Driving emissions of Mercedes-Benz Cars fleet (EU, China, USA and RoW) standardised, mileage: 200,000 km, for data basis see chapter [7 Development of CO<sub>2</sub> emissions](#)

<sup>5</sup> Forecast value

at up to 22 kW at almost any alternating-current source. The system is compatible with all of the electric vehicle and plug-in hybrid models of Mercedes-Benz AG.

### Expansion of the charging infrastructure at Mercedes-Benz locations

Mercedes-Benz AG is continually expanding the charging infrastructure at its own locations. We have put more than 4,000 charging points into operation since 2013. In 2022 we will continue to forge ahead with the expansion of charging stations at employee parking

lots with about 900 charging points. This provides the employees with a broad range of charging options.

In the charge@work project, we have been consolidating our efforts to establish an intelligent charging infrastructure at all Group properties in Germany since 2013. We provide this infrastructure not only to parking spaces, car parks and customer centres but also to our in-house development test rigs and proving grounds. Our charging stations are supplied with 100 per cent certified green electricity.

### Scope 1, 2 and 3 emissions worldwide for Mercedes-Benz Cars<sup>1,5</sup>

Scope 3	2020		2021	
	Specific CO <sub>2</sub> in t/car	Absolute CO <sub>2</sub> in t/million t <sup>4</sup>	Specific CO <sub>2</sub> in t/car	Absolute CO <sub>2</sub> in t/million t <sup>4</sup>
Procured goods and services <sup>6</sup>	8.1	17.0	8.4	17.0
Logistics	1.0 <sup>2</sup>	2.1 <sup>2</sup>	1.1 <sup>2</sup>	2.2 <sup>2</sup>
Business travel	0.006	0.012	0.009	0.019
Employee traffic	0.060	0.125	0.053	0.107
Use phase of our products (well-to-tank)	5.6	11.8	6.3 <sup>3</sup>	12.7 <sup>3</sup>
Use phase of our products (tank-to-wheel)	33.7	70.4	32.2	65.5
Recycling and waste disposal <sup>6</sup>	0.4	0.8	0.4	0.8
<b>Scope 1 and 2</b>				
Manufacture	0.8	0.9 <sup>4</sup>	0.7	0.7 <sup>4</sup>
<b>Total</b>	<b>49.7</b>	<b>103.2</b>	<b>49.1</b>	<b>99.2</b>

1 Values are rounded

2 Forecast value

3 Incl. Green Charging: Contribution per vehicle -0.03 t CO<sub>2</sub>

4 Absolute Scope 3 emissions relate to retail sales (2020: 2,087,200; 2021: 2,032,663; unaudited). Absolute Scope 1 and 2 emissions relate to vehicles produced from fully consolidated locations, excluding third-party products (2020: 1,230,733; 2021: 1,132,213; unaudited)

5 For calculation basis see appendix [7 Calculation and documentation of CO<sub>2</sub> emissions](#) and chapter [7 Making life cycle assessments, 7 Calculation of CO<sub>2</sub> emissions](#)

6 See [Life cycle assessments of our vehicles](#) and internal life cycle assessment studies

### Scope 1, 2 and 3 emissions worldwide for Mercedes-Benz Vans<sup>1,4</sup>

Scope 3	2021	
	Specific CO <sub>2</sub> in t/van	Absolute CO <sub>2</sub> in t/million t <sup>3</sup>
Procured goods and services <sup>5</sup>	8.6	3.4
Logistics	0.9 <sup>2</sup>	0.4 <sup>2</sup>
Business travel	0.007	0.003
Employee traffic	0.039	0.015
Use phase of our products (well-to-tank)	4.9	1.9
Use phase of our products (tank-to-wheel)	47.8	18.9
Recycling and waste disposal <sup>5</sup>	0.5	0.2
<b>Scope 1 and 2</b>		
Manufacture	0.5	0.2 <sup>3</sup>
<b>Total</b>	<b>63.3</b>	<b>25.0</b>

1 Values are rounded

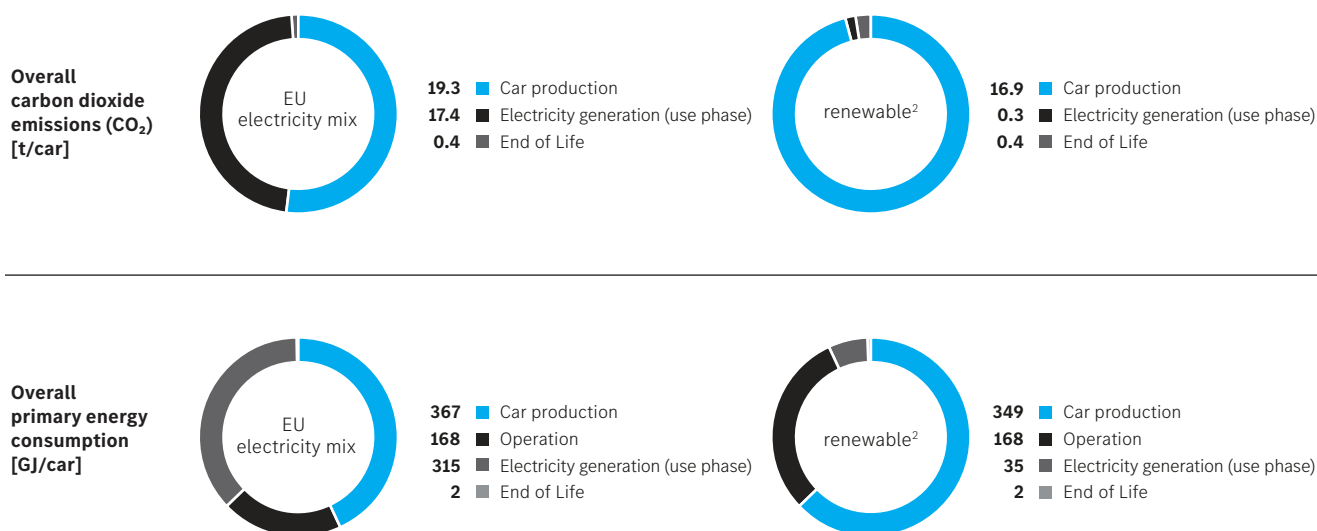
2 Forecast value

3 Absolute Scope 3 emissions relate to retail sales (2021: 394,978; unaudited). Absolute Scope 1 and 2 emissions relate to vehicles produced from fully consolidated locations, excluding third-party products (2021: 336,847; unaudited)

4 For calculation basis see appendix [7 Calculation and documentation of CO<sub>2</sub> emissions](#) and chapter [7 Making life cycle assessments, 7 Calculation of CO<sub>2</sub> emissions](#)

5 Internal life cycle assessment studies

## Life cycle assessment of the EQS 450+<sup>1</sup>



1 WLTP: EQS 450+ combined electrical consumption 19.8-15.7 kWh/100 km, CO<sub>2</sub> emissions 0 g/km;  
 Electricity consumption was determined on the basis of Regulation 2017/1151/EC.  
 2 Renewably generated energy for cell production and charging current

(values are rounded)

## Board of Management remuneration on the basis of key CO<sub>2</sub> figures

In addition to other criteria from areas such as environmental protection, social commitment and corporate governance, the Mercedes-Benz Group has, since 2020, been including the achievement of CO<sub>2</sub> fleet targets as a factor for determining the annual bonus for the Board of Management and executives. During the reporting year, we continued to differentiate this incentive system and intensified it. We think it helps motivate people to achieve the specified sustainability targets.

## Effectiveness and results

### The effectiveness of our management approach

**GRI 103-3**

The Mercedes-Benz Group's management approach to climate protection is based on the Ambition 2039 targets. They are an expression of our commitment to the Paris Agreement on climate change. We have also defined the measures that we plan to use to attain these goals. We use internal and external performance reviews to evaluate their effectiveness. To this end, we conduct internal reviews at the level of the specialist units several times a year. Externally, we commission an

auditing company to audit selected goals and measures. In addition, Mercedes-Benz Cars & Vans has defined a concrete CO<sub>2</sub> reduction pathway in line with the standards of the Science Based Targets initiative (SBTi). The SBTi has confirmed that this pathway conforms to the Paris Agreement on climate change.

Furthermore, we conduct dialogues regarding climate protection and we use the knowledge gained in this way to review our management approach and adjust it as needed. For example, we hold in-depth discussions with environmental institutes and NGOs during our annual [Sustainability Dialogue](#). We also conduct talks on the subject of climate protection with our Board of Management throughout the year. In addition, the feedback we continually receive from the government, the public and our other stakeholders lets us know how the sustainability goals we have set for ourselves are being perceived and evaluated

## Results

### Calculation of CO<sub>2</sub> emissions

**GRI 305-3**

Most of our CO<sub>2</sub> emissions are generated during the use phase of a vehicle. But greenhouse gas emissions are also generated in other segments of a vehicle's life

cycle, and we take that into account in our overall CO<sub>2</sub> balance. We record the key figures we need for life cycle assessments and publish them in line with the 2004 Corporate Accounting and Reporting Standard of the Greenhouse Gas Protocol Initiative.

We have used these principles to calculate the emissions of the entire life cycle of the Mercedes-Benz Cars fleet worldwide. For 2021 we calculated an average CO<sub>2</sub> value of 49.1 tons per vehicle. We have used these principles to calculate the emissions of the entire life cycle of the Mercedes-Benz Vans fleet worldwide. For 2021 we calculated an average CO<sub>2</sub> value of 63.3 tons per vehicle. 52.7 tons of this is due to the use phase, which in the case of vans is dominated by commercial goods transport with vehicles in the 3.5 ton/5 ton segment.

[↗ Scope 1, 2 and 3 emissions worldwide Mercedes-Benz Cars & Vans](#)

## Development of CO<sub>2</sub> emissions

**GRI 305-5**

### Europe

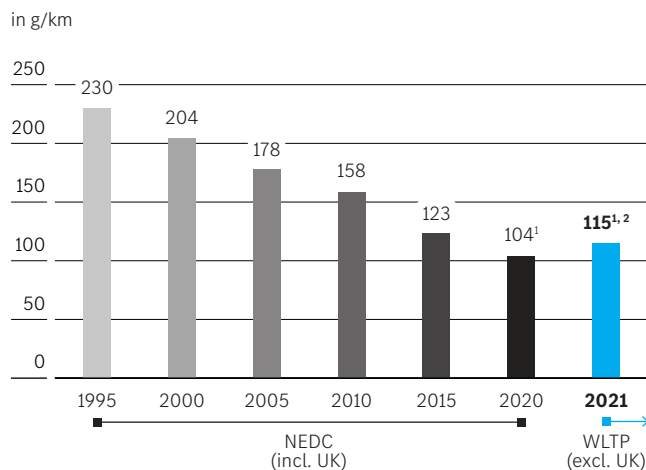
Mercedes-Benz has defined the CO<sub>2</sub> emissions of its fleet of new cars in Europe as a significant non-financial performance indicator. The Outlook shows how we expect the CO<sub>2</sub> emissions of our car fleet in Europe to develop.

[🌐 Outlook, AR 2021](#)

In the reporting year, the average CO<sub>2</sub> emissions of our total passenger car fleet in Europe (European Union, Norway and Iceland) as measured on the basis of legal regulations decreased to an estimated 115 g/km (WLTP, including vans that are registered as passenger cars). This means that we achieved the CO<sub>2</sub> targets in Europe (European Union, Norway and Iceland) in 2021. Since 2021, in line with the regulatory requirements, this value has been based on the WLTP certification process and is thus not comparable with the prior year's value.

## Development of average CO<sub>2</sub> emissions of the Mercedes-Benz passenger car fleet in Europe

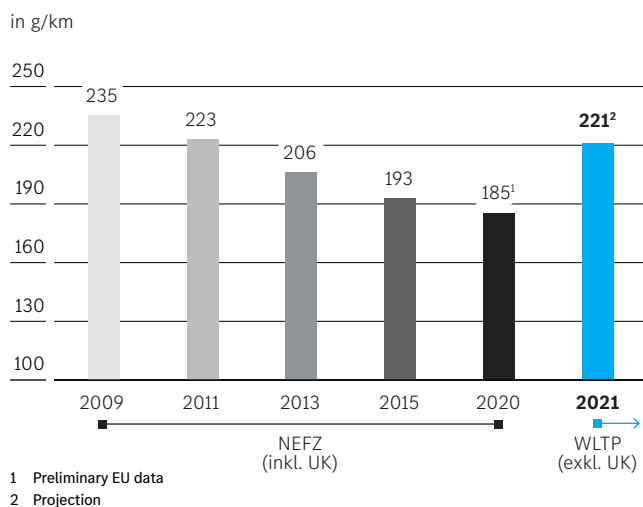
**GRI 302-5**



We expect that our fleet's average CO<sub>2</sub> emissions in Europe (European Union, Norway and Iceland) in 2022 will once again be lower than the figure that was recorded in 2021. This development has been especially favoured by the fact that all-electric and plug-in hybrid vehicles continue to increase their share of our total car sales.

In the reporting year, the average CO<sub>2</sub> emissions of our light commercial vehicles ([👁 Class N1 vehicles](#)) in Europe (European Union, Norway and Iceland) as measured on the basis of the legal regulations amounted to 221 g/km (WLTP). As a result, we expect to be below the CO<sub>2</sub> target. In 2022 we expect the continued expansion of our battery-electric product portfolio (launch of the eCitan) to reduce CO<sub>2</sub> emissions further.

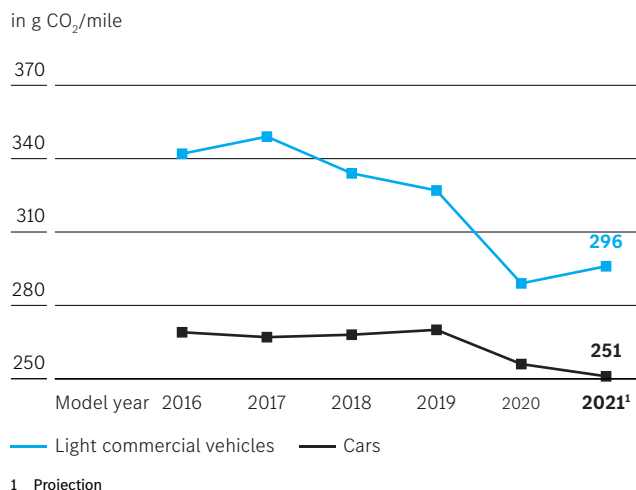
### Development of average CO<sub>2</sub> emissions of the Mercedes-Benz van fleet in Europe



### United States

In the United States, two separate fleet values are in use for limiting greenhouse gases and fuel consumption in vehicle fleets: the [greenhouse gas \(GHG\) emission standards](#) and the [Corporate Average Fuel Economy standards \(CAFE\)](#). For the 2021 model year, the GHG fleet value was 251 g CO<sub>2</sub>/mi for the passenger car fleet and 296 g CO<sub>2</sub>/mi for the fleet of vans and SUVs registered as light trucks (on the basis of the most recent forecast). Thus we were not able to achieve our average fleet targets of 194 g CO<sub>2</sub>/mi for the car fleet and 259 g CO<sub>2</sub>/mi for the fleet of vans and SUVs registered as light trucks. However, we were able to close the remaining gap by purchasing external credits.

### Mercedes-Benz GHG values for cars and light commercial vehicles in the United States



The models of the Mercedes-Benz Sprinter are subject to the GHG regulation for Classes 2b/3. The CO<sub>2</sub> targets in these classes depend on the payload, the towing capacity and the drive type of the vehicles. In the reporting year, the CO<sub>2</sub> emissions of our vehicles were 472 g CO<sub>2</sub>/mi, which is lower than the target value of 495 g CO<sub>2</sub>/mi. We expect our figures to also be lower than the CO<sub>2</sub> target values in the years ahead.

### China

In China, domestic and imported cars are reported separately and according to fleet consumption values, unlike in Europe and the United States. This means the figures for the imported fleet are relevant for our wholly owned subsidiary Mercedes-Benz China (MBCL). The fuel consumption target was 7.16 l/100 km, and the achieved value was 8.24 l/100 km (preliminary figure for the fleet's fuel consumption; if the off-cycle technologies are also included, the final fuel consumption figure may be better). Since 2021, in line with the regulatory requirements, this value has been based on the WLTP certification process and is thus not comparable with the prior year's value. External credits will be purchased at short notice in order to close consumption gaps in the fleet's achievement of the target. We aim to achieve our emission targets in China in the medium term together with our joint venture partner Beijing Benz Automotive (BBAC) by expanding our range of all-electric vehicles and plug-in hybrids.

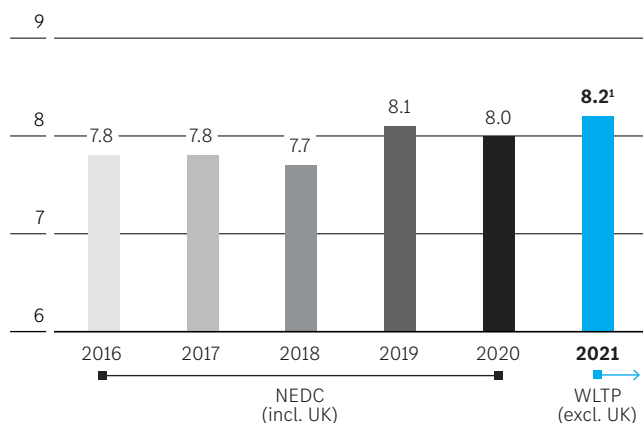
The V-Class and Vito models, which are produced by the joint venture Fujian Benz Automotive Co., Ltd. (FBAC), form another domestic fleet. The value achieved was 9.27 l/100 km (without off-cycle technology); the target value was 8.09 l/100 km. At the moment, the fleet balance can be offset by means of a credit transfer. This situation is not likely to change until 2026, because the fleet consists of only a single vehicle type.

Legal limits on the fuel consumption and/or CO<sub>2</sub> emissions of car fleets and light truck fleets exist today in many other markets as well, although the target values differ from market to market. The relevant countries here include major sales markets for our products — for example Switzerland, Canada, Japan, South Korea, Brazil, India and Saudi Arabia. We also take these target values into account as we further develop our product range.

### Fuel consumption of the Mercedes-Benz car fleet in China

GRI 302-5

in l/100 km



1 Preliminary value without off-cycle technologies



# Climate protection in the supply chain

## Strategy and concepts

### Climate-protection goal: CO<sub>2</sub> neutrality

GRI 103-1

Through its Ambition 2039, the Mercedes-Benz Group aims to achieve CO<sub>2</sub> neutrality in less than 20 years. In doing so, the company is taking into account the entire value chain, including its partners and suppliers. That's because our supplier network plays a crucial role in the attainment of the climate-protection goals. For example, the production of an all-electric vehicle generates about twice as much CO<sub>2</sub> as that of a conventional combustion-engine vehicle. This is primarily due to the lithium-ion batteries.

## Measures

### Environmental impact in the supply chain

GRI 103-2 GRI 308-1

Mercedes-Benz Group AG implements various projects and measures in order to avoid and reduce CO<sub>2</sub> emissions in its supply chains for services as well as for production and non-production materials.

In 2020, Mercedes-Benz AG also began to send an Ambition Letter about CO<sub>2</sub> neutrality to its suppliers of production materials. By signing this document, they commit themselves to supply Mercedes-Benz AG only with products that are CO<sub>2</sub> neutral over their life cycle — and thus to pursue our climate-protection goals — by 2039 at the latest.

#### ➔ Effectiveness and results

On the way to climate neutrality, Mercedes-Benz Cars & Vans also pursues selected focal points for production materials. In a first step, we investigated which players and which stages of the supply chain produce large amounts of CO<sub>2</sub> emissions. We then defined quantitative intermediate targets for CO<sub>2</sub> emissions in our supply chains. These targets were derived on the basis

of the results of our supplier talks and set with the help of external experts. We are focusing on materials and components that emit large amounts of CO<sub>2</sub> during production, e.g. steel, aluminium, certain types of plastic and batteries. To conclude, we integrated the target values into our criteria for the awarding of contracts. When awarding contracts for our Mercedes-Benz Modular Architecture (MMA) electric vehicle platform for compact and mid-range models, we employ the CO<sub>2</sub> and recycle requirements as key criteria for all areas. During the reporting year, suppliers assured us that they would fulfil our targets for more than 40 contracts awarded for this model series alone. This means that they will continuously reduce the CO<sub>2</sub> emissions of materials and components that cause high CO<sub>2</sub> emissions in particular, as well as increasing the amount of secondary raw materials.

In 2021, we developed requirements and guidelines for the calculation of CO<sub>2</sub> emissions in order to provide suppliers with guidance and obtain uniform, and thus comparable, supplier data.

The Mercedes-Benz Group is also cooperating with organisations such as  CDP (formerly Carbon Disclosure Project) so that it can depict the environmental impact of its supply chains even more transparently. In 2021, for example, we took part successfully in the CDP Supply Chain Programme for the third time. As part of this programme, we ask our suppliers to report to us about their environmental impact and climate protection efforts. CDP provides the corresponding tools for recording, assessing and publishing environmental and climate data. We contacted our main suppliers regarding this in 2021. They account for around 84 per cent of the annual procurement volume of Mercedes-Benz Cars & Vans. Around 90 per cent of them took part in the survey.

We also expect our suppliers of production materials to operate with an environmental management system that is certified according to ISO 14001 or EMAS.

Depending on the specific risks, this also applies to suppliers of non-production materials and services. If a supplier does not have a certified environmental management system, the supplier is given two years to set up such a system and have it certified. If this is not done, the supplier may be excluded from receiving new orders.

Depending on the risk, environmentally sensitive contracts for the purchase of non-production materials and services will, in future, also require proof of an energy management system, in the form of ISO 50001, for example. Moreover, suppliers of services and of non-production materials for CO<sub>2</sub>-intensive commodities will also be requested to sign the Ambition Letter that requires them to make their production CO<sub>2</sub> neutral or to provide their services in a CO<sub>2</sub> neutral fashion by no later than 2039. Depending on the project in question, CO<sub>2</sub> reduction measures will also be agreed upon during the contract award process for suppliers of non-production materials and service providers, for example by utilising electricity from renewable energy sources when fulfilling the order.

### CO<sub>2</sub> neutral production materials

The Mercedes-Benz Group is working together with suppliers to develop measures for reducing the CO<sub>2</sub> emissions of the procured production and non-production materials and the supply of goods to the plants (inbound logistics). Beginning in 2039 we want Mercedes-Benz AG to procure only production materials that have been manufactured in a CO<sub>2</sub> neutral fashion.

To this end, Mercedes-Benz AG has signed agreements with its strategic battery cell partners for the procurement of battery cells whose production is CO<sub>2</sub> neutral. Two of these partners began to supply Mercedes-Benz in 2021, commencing with battery cells for the EQS. The production of these battery cells is CO<sub>2</sub> neutral, which enables us to reduce the emissions for a cell by about 30 per cent. The inspection and certification organisations SGS and DEKRA have examined and confirmed that the cells are manufactured in a CO<sub>2</sub> neutral manner by the suppliers.

We have also launched similar initiatives in other parts of our supply chain so that we and our partners can jointly reduce CO<sub>2</sub> emissions step by step. An example of this is our involvement in the Swedish startup H2

Green Steel. The results also benefit the other business units of Mercedes-Benz Group AG.

### Production materials: Cooperation with suppliers

#### Supplier survey regarding green electricity

The generation of the electricity consumed also plays a major role for the CO<sub>2</sub> emissions in the supply chain. From May to June 2021, Mercedes-Benz AG asked its key suppliers how much of the electricity they consume comes from renewable energy sources. The survey covered both the electricity that suppliers generated themselves and the power that they procured from external producers. We use the results for environment-related analyses of our supplier network and for concrete supplier assessments and dialogues.

#### Award for suppliers

The Mercedes-Benz Group considers climate protection and resource conservation in the supply chain to be an element of its cooperative partnership with suppliers. The public recognition of good performance in this regard is also important to us. During the reporting year, we therefore presented the [Daimler Sustainability Recognition](#) to suppliers for outstanding sustainability achievements in the categories of climate protection and resource conservation. In 2021, we honoured the American steel supplier Big River Steel for its especially sustainable steel production. A total of three suppliers were nominated for their innovative concepts for the use of secondary materials and for CO<sub>2</sub>-reduction measures at their production facilities.

## Effectiveness and results

**GRI 103-3** **GRI 308-2**

We continuously monitor the progress that we make with our Ambition 2039 targets for cars. One of the reference points that Mercedes-Benz Cars Procurement and Supplier Quality uses for this is the number of suppliers who have agreed to the letter of intent regarding Ambition 2039. The results show that Mercedes-Benz AG's supplier network has largely agreed to the Group's climate-protection goals as formulated in Ambition 2039. Around 90 per cent of our suppliers (as measured on the basis of the annual procurement volume) have signed the Ambition Letter to express their commitment to supply the Group only with CO<sub>2</sub> neutral products by 2039. Climate neutrality

is incorporated into the terms of contract, and the Ambition Letter is a key criterion for the awarding of contracts. This means that if a supplier refuses to sign the ambition letter, we will not consider this supplier for future contracts. By 2039 at the latest, only production materials that are CO<sub>2</sub> neutral at all stages of the value chain will be allowed to enter the plants of Mercedes-Benz.

# Climate protection in production

## Strategy and concepts

### Implementation of the Paris Agreement — CO<sub>2</sub> neutral production from 2022

In its sustainable business strategy the Mercedes-Benz Group has set itself the holistic goal of making the mobility of the future more sustainable. One important target is the reduction of greenhouse gas emissions. This applies not only to our mobility solutions but also to our own production plants. By pursuing our goal of making our production processes CO<sub>2</sub> neutral we are fulfilling our voluntary commitment to the Paris Agreement and complying with other national and international climate-protection guidelines.

The expansion of electric mobility is the key for making mobility more sustainable in the future, which is why Mercedes-Benz has flexibly planned its global manufacturing network for the production of all-electric vehicles. The plans call for eight Mercedes-EQ electric vehicles to roll off the assembly lines at seven locations. Moreover, all of the car and battery assembly locations operated by the Mercedes-Benz Group will have climate-neutral production processes from 2022.

### Responsibilities and organisation

#### GRI 103-2

The Mercedes-Benz Group operates more than 30 production facilities all over the world that are subject to a variety of regional and national laws. The environmental and climate-protection measures at our production locations are controlled and coordinated across business units by three regional committees: Germany/Europe, North and South America and Africa/Asia. The committees let our experts form networks between companies and plants and share information about legislation, processes and innovations. In addition, these committees draw up globally valid internal standards and procedures.

### CO<sub>2</sub> neutral sales

Climate protection is a matter for the entire value chain. Due to its many locations, the sales organisation of Mercedes-Benz also has considerable potential to drastically reduce CO<sub>2</sub> emissions. The company-owned sales and service outlets of Mercedes-Benz AG in Germany are striving to become CO<sub>2</sub> neutral by the end of 2022.

However, the associated investments in energy efficiency and renewable energies are not only contributing to climate protection. They also produce financial benefits due to rising energy prices and various political decisions. For example, climate-protection measures also have a high marketing potential for our car dealerships, because they are the main point of contact for customers and are very visible at the local level.

### European Union Emissions Trading System

Industrial facilities that generate CO<sub>2</sub> emissions as a result of the combustion of fossil fuels and whose approved [thermal output](#) exceeds 20 MW are required by law to participate in the [EU Emissions Trading System \(EU ETS\)](#). The operators of such facilities are required to calculate on an annual basis the CO<sub>2</sub> emissions they generate, report the figures to the responsible authorities, and then submit to the same authorities CO<sub>2</sub> emission permits in the amount of the reported CO<sub>2</sub> emissions. The company is permitted to generate one ton of CO<sub>2</sub> per CO<sub>2</sub> emission permit (European Union Allowance — EUA). The permitted total number of EUA certificates within the EU's emissions trading program is limited. A small number of EUA certificates are assigned to industrial plants free of charge. Fewer and fewer free CO<sub>2</sub> emission permits are issued each year, which means that by the end of the fourth trading period (2021 to 2030) the number of such permits available to the automotive industry and many other sectors will have been reduced to zero. A large portion of the CO<sub>2</sub> emission certificates needed must therefore be acquired at a cost via EUA auctions, the emission permit market or direct trading. At the Mercedes-Benz Group, an

in-house committee consisting of experts from various departments defines the procurement strategy and the risk management for the EUA certificates needed by the Group.

More than half of the CO<sub>2</sub> emissions generated at the Mercedes-Benz Group's European production locations are currently covered by the EU Emissions Trading System. We are using various measures to try to further reduce our CO<sub>2</sub> emissions. These include projects to increase energy efficiency and expand the capacity of systems that generate heat and electricity from renewable sources.

### **German National Emissions Trading System**

Since the beginning of 2021, Germany has also had a legally prescribed fuel emissions trading process that complements the European emissions trading scheme. The new Fuel Emissions Trading Act (BEHG) has introduced CO<sub>2</sub> pricing by means of a national emissions trading process for amounts that are not subject to the EU Emissions Trading System (EU ETS). The law applies to the heating and transport sectors in particular. Accordingly, the Mercedes-Benz Group must ensure the acquisition of certificates for the fossil fuels it uses that are not subject to the EU ETS.

## **Measures**

### **Procuring green electricity**

Mercedes-Benz has committed itself to consistently reducing CO<sub>2</sub> emissions caused by vehicle production and energy supply at its plants, or to eliminate them completely wherever possible. The procurement of green electricity plays a key role in these efforts. Beginning in 2022, worldwide all of the Mercedes-Benz Group's own production plants will obtain externally generated electricity exclusively from renewable sources.

In Germany, Mercedes-Benz is cooperating with the energy supplier Enovos and the Norwegian energy producer Statkraft to expand its portfolio of green electricity. This electricity mix consists of solar, wind and hydro power. The electricity is generated by a variety of facilities, including a solar park near Ingolstadt as well as hydroelectric power stations and more than 200 wind turbines throughout Germany. This green electricity is generated

at the same rate as it is consumed. This ensures that the company's exact electricity requirements are met by green power from the grid with an accuracy of 15 minutes.

Since early 2022, all of the company-owned sales and service outlets in Germany have been procuring electricity from renewable sources. This enables the annual CO<sub>2</sub> emissions from building operation to be cut by around half.

### **Generation of green electricity**

#### **GRI 302-1**

Another major pillar of CO<sub>2</sub> neutral production at Mercedes-Benz involves increasing the generation of energy from renewable sources at the various locations.

The production of the EQS at Factory 56 in Sindelfingen since May 2021 is a great example of the sustainable and CO<sub>2</sub> neutral vehicle production of the future at Mercedes-Benz: the plant is a zero carbon factory. A photovoltaic (PV) system not only covers around 30 per cent of the hall's needs annually with self-generated green electricity but also charges a stationary energy storage unit from Mercedes-Benz Energy. The latter has a capacity of 1,400 kWh and serves as a buffer on days when there is little sun, for example.

PV systems for the self-generation of green electricity are also to be installed on existing buildings at five Mercedes-Benz locations in Germany in 2022. PV systems are to be set up on further buildings in the future, if possible.

In addition, Mercedes-Benz U.S. International, Inc. (MBUSI) and the utility company Alabama Power received approval in December 2021 for a solar energy project in Lowndes County, south of Montgomery. The resulting Letohatchee solar park will supply our production plant in Tuscaloosa, Alabama (United States) with power from the sun in the future. Commercial operations are scheduled to begin in March 2024.

### **More sustainable heat supply**

The Mercedes-Benz Group is also reducing CO<sub>2</sub> emissions arising from the plants' heat supply. Among other things, the company plans to use biogas, biomass, geothermal energy and solar heating systems and to commission heat pumps powered by green electricity.

Beginning in 2022, Mercedes-Benz Cars wants to gradually increase the procurement of biogas for the production processes at German locations. The Mercedes-Benz Vans plant in Ludwigsfelde (Germany) procures district heating. More than 45 per cent of this heat comes from renewable sources of energy and reduces the CO<sub>2</sub> emissions from our Sprinter production at the location.

### **Offsetting CO<sub>2</sub> emissions**

The Mercedes-Benz Group has, since early 2022, been offsetting all the CO<sub>2</sub> emissions at its production facilities that have been as yet unavoidable by means of carbon offsets from qualified climate protection projects.

Such residual emissions are released above all by our cogeneration facilities that use natural gas to produce electricity and heat. All of the offsetting projects comply with the high quality standards of the [Clean Development Mechanism \(CDM\)](#). Moreover, they are validated according to the [Gold Standard](#). The climate-protection projects not only avoid CO<sub>2</sub> emissions but also promote sustainable, socially beneficial and environmentally friendly development in many ways in the countries where the projects take place. Our portfolio also includes offsetting projects that promote a renewables-based energy supply, for example energy from geothermal sources in Indonesia and energy for the reduced-CO<sub>2</sub> purification of drinking water in Uganda.

### **Global battery production network**

The vehicle portfolio of Mercedes-Benz Cars & Vans is set to become all-electric by 2030. In this process, the local production of batteries is a crucial element for flexibly and efficiently meeting the global demand for electric vehicles. As a result, Mercedes-Benz is continuing to expand its global battery production network, which is an important component of its global production network.

In the future, this battery production network is to consist of factories on three continents. We are already producing battery systems in Kamenz, Saxony, in Stuttgart-Hedelfingen and in Bangkok (Thailand), Beijing (China) and Jawor (Poland). The battery factories in Esslingen-Brühl near Stuttgart and in Tuscaloosa, Alabama (United States) are currently preparing themselves for the production launch in 2022.

In order to further increase capacities in our global battery production network, we will cooperate even more strongly with the company GROB from Mindelheim, which specialises in battery facility technology. Our goal is to jointly develop and set up assembly systems for upcoming battery modules and systems. These facilities will produce the batteries for our EQ models that will roll off the assembly line beginning in 2025.

Moreover, Mercedes-Benz plans to work together with partners worldwide to build eight factories for the production of battery cells.

This will enable Europe to remain a centre of the automobile industry even in the electric age. Here, Mercedes-Benz intends to work together with new partners to develop future cells and modules and efficiently produce them at four locations. To this end, Mercedes-Benz has a holding in the European battery cell manufacturer Automotive Cells Company (ACC).

### **More sustainable transport logistics**

Whether going by ship, plane, train or truck, our global transport logistics system now serves 30 production plants on four continents and customers all over the world. The Mercedes-Benz Group transported around 2.3 million vehicles worldwide in 2021 and about 3.7 million tons of production materials in Europe during the first half of 2021 alone. Our global transport volume amounted to around 260,000 standard containers of sea freight and about 120,000 tons of air freight.

Our aim is to further reduce the associated CO<sub>2</sub> emissions. One of the levers here is our logistics network, which we are continuously optimising. Our main goal here is to connect the transport hubs with one another as effectively as possible so that the driving distances can be reduced and the capacity of the transport systems is better utilised. Innovative transport concepts and new modes of transport also play a major role in reducing emissions.

We now select logistics concepts not only on the basis of their costs, duration and transport quality but also according to their CO<sub>2</sub> emissions. When choosing providers of logistics services, we also take sustainability criteria into account. Among other things, we determine whether service providers have environmental certificates and use

environmentally compatible equipment or low-emission trucks that meet the latest Euro emissions standards.

In particular, Mercedes-Benz is steadily increasing the volumes it transports via the railroad network. For example, the production materials for the Mercedes-Benz car plants in Germany and the plant in Kecskemét (Hungary) have been transported in trains powered by green electricity since as early as 2020.

In addition, we are reducing the CO<sub>2</sub> emissions not only on railways but also from ship-borne freight. At the beginning of 2021, we launched a joint project together with a transport service provider. In this project, a ship fuelled with biofuel transported more than 1,000 Mercedes-Benz vehicles from Bremerhaven via South Africa to Australia. The CO<sub>2</sub> emissions were reduced by about one third compared to conventional ship propulsion fuels.

From June to September 2021, Mercedes-Benz became one of the first automakers to take part in a CO<sub>2</sub> neutral cargo flight route, with the aim of decarbonising air shipments. The planes on the transport route from Frankfurt to Beijing use sustainable aviation fuel (SAF), which is made of waste biomass such as used cooking oil (UCO). SAF causes around 80 per cent less CO<sub>2</sub> emissions per flight than conventional aviation fuel.

### **More sustainable sales operations**

Mercedes-Benz wants to make its sales operations more sustainable and climate-friendly. However, this is only possible with the support of our sales partners. We have published two information brochures to help them operate and build Mercedes-Benz sales outlets in a more sustainable and climate-friendly manner.

The first brochure was released in November 2020. It provides instructions on how to reduce CO<sub>2</sub> emissions in dealerships. A total of 28 measures are presented. They range from minor adjustments in building operation to detailed renovation measures and the local generation of renewable energies. The second information brochure has been available since March 2021. It addresses sustainable construction and covers a building's entire life cycle, from the planning stage and the production of the construction materials to demolition and the recycling or disposal of the rubble.

In July 2021, the Mercedes-Benz Group also launched the online training course "Sustainability at Mercedes-Benz Retail" for its car dealerships. The course is targeted at managers and employees working in Sales and After Sales. The first part of the course teaches theoretical content, such as the fact that sustainability is a key element of our strategy. The second part addresses practical concerns and, among other things, shows what sustainability means for dealerships in concrete terms and how they can contribute to sustainability.

## **Effectiveness and results**

### **The effectiveness of our management approach**

**GRI 103-3**

The Mercedes-Benz Group uses internal and external tools to determine how much progress its plants are making in achieving the climate-protection targets. The Mercedes-Benz Group has defined the parameters for in-house reviews, and it regularly monitors these parameters. An external auditing firm annually evaluates a selected number of our corporate goals and their implementation. We use the results of these evaluations to adapt and improve our climate-protection measures.

### **Results**

**GRI 302-1 GRI 305-5**

For years now, Mercedes-Benz has been systematically recording all climate-protection measures in a database. This data enables us to efficiently manage our corporate objectives, because the respective measures can be saved and monitored in the database along with the corresponding calculations for CO<sub>2</sub> reductions. These include measures such as the technical optimisation and automation of the control system in order to adjust the operating modes of our ventilation systems. We also optimise our painting processes and the associated facilities. The reduced energy consumption ensures that CO<sub>2</sub> emissions from energy generation can be effectively avoided.

During the reporting year, Mercedes-Benz Cars & Vans employed a bundle of measures that enabled it to cut CO<sub>2</sub> emissions from production by about 16 per cent compared to 2020.

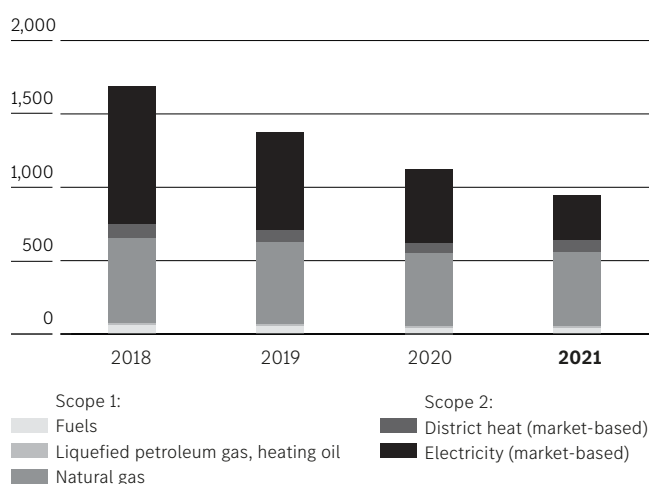


In the reporting year, renewable energy accounted for 78 per cent (1,500 GWh) of the total electricity consumption at Mercedes-Benz Cars production plants and for 34 per cent (1,550 GWh) of the total energy consumption. At Vans, renewable energy accounted for 64 per cent (181 GWh) of total electricity consumption and for 20 per cent (197 GWh) of total energy consumption.

## Direct and indirect CO<sub>2</sub> emissions from production

GRI 302-1/-5

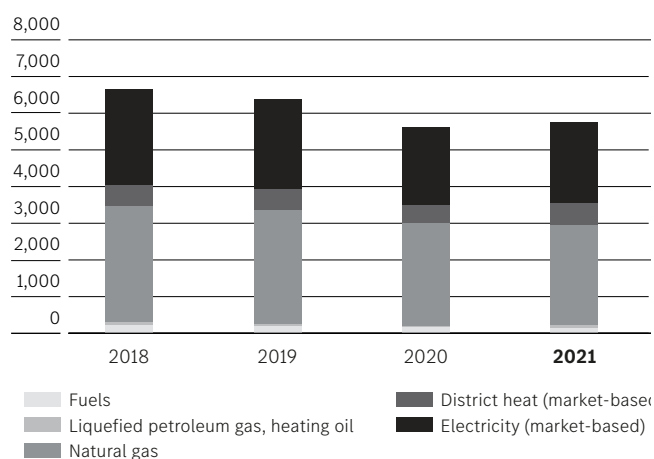
in 1,000 t



## Energy consumption in production

GRI 302-1/-5

in GWh



## CO<sub>2</sub> emissions from energy consumption<sup>1</sup> (in 1,000t)

GRI 305-1/-2

	2017	2018	2019	2020	2021 <sup>2,3</sup>
CO <sub>2</sub> direct (Scope 1)	1,192	1,247	1,239	1,027	681
CO <sub>2</sub> indirect (Scope 2) — market-based	1,763	1,687	1,276	1,035	466
CO <sub>2</sub> indirect (Scope 2) — location-based	2,041	1,985	1,706	1,492	1,123
<b>Total — market-based</b>	<b>2,955</b>	<b>2,934</b>	<b>2,516</b>	<b>2,062</b>	<b>1,148</b>
<b>Total — location-based</b>	<b>3,233</b>	<b>3,232</b>	<b>2,946</b>	<b>2,519</b>	<b>1,805</b>

1 Since 2016, the "market-based" and "location-based" accounting approaches have been implemented in accordance with GHG Protocol Scope 2 Guidance. Since then, the market-based approach has been the standard accounting method.

2 These data include Mercedes-Benz Cars & Vans. The spin-off and hive-down of the Daimler commercial vehicle business as an independent company makes it impossible to compare these data with the data from the previous years.

3 These data have been adjusted due to the spin-off and hive-down of the Daimler commercial vehicle business as an independent company, nonetheless, they still contain minor uncertainties as adjustments for combined locations and units can first be made in financial year 2022.

## Specific CO<sub>2</sub> emissions (in kg/vehicle)<sup>1</sup>

GRI 305-1/-2

		2017	2018	2019	2020	2021
Cars	CO <sub>2</sub> direct (Scope 1)	250	267	279	326	349
	CO <sub>2</sub> indirect (Scope 1) — market-based <sup>2</sup>	565	562	431	426	306
	<b>Total — scope 1 &amp; 2</b>	<b>815</b>	<b>829</b>	<b>711</b>	<b>752</b>	<b>655</b>
Vans	CO <sub>2</sub> direct (Scope 1)	340	355	346	333	353
	CO <sub>2</sub> indirect (Scope 2) — market-based <sup>2</sup>	157	196	160	147	141
	<b>Total — scope 1 &amp; 2</b>	<b>497</b>	<b>551</b>	<b>506</b>	<b>479</b>	<b>493</b>

1 Excluding CO<sub>2</sub> from liquid fuels

2 Since 2016, the "market-based" and "location-based" accounting approaches have been implemented in accordance with GHG Protocol Scope 2 Guidance. Since then, the market-based approach has been the standard accounting method.



# Air quality

## Materiality and goals

GRI 103-1/-2

### Targets

### Target horizon

Our objective is to ensure that our entire new vehicle fleet no longer has any relevant impact on nitrogen dioxide pollution in urban areas.

2025

The Mercedes-Benz Group's corporate responsibility as an automaker includes our efforts to bring individual mobility, climate protection and air quality into harmony. The air quality in cities is an important focus of our sense of responsibility for the environment. Legislators all over the world have set standards for emissions in

order to regulate emissions of harmful substances such as nitrogen oxides and particulates and to reduce air pollution. These emission limit values have become ever more stringent over the past few years. We are continuously developing our technologies in order to remain below these limit values today and in the future.

## Strategy and concepts

### Reduction of airborne pollutants — vehicle-related and in production operations

GRI 103-1/-2

In order to reduce the pollutant emissions of our vehicles, we specify certain properties and necessary measures in the concept and/or the requirement specifications for major assemblies. These concept and requirement specifications are approved by the Committee for Model Policy and Product Planning. This is Mercedes-Benz Cars' highest body and determines all product-related topics.

We have set ourselves the following goal for Mercedes-Benz's entire new car fleet: The fleet shall no longer have any relevant impact on NO<sub>2</sub> emissions in urban areas from 2025. In addition, we want to develop further measures in order to reduce the particulate pollution due to our vehicles.

But not only our vehicles are a source of air pollution emissions — our plants also contribute. Lowering the airborne emissions from our plants is a constant task and a challenge — for our plant and facility planning teams and our daily operations.

Depending on their type and size, the plants in Germany are legally obliged to appoint an Immission Control Officer. Depending on the material in question, the maximum values and requirements for emissions and immissions are set by law. These values are the standard for our production plants and product developers. During the reporting year we adopted an internal standard covering the creation of an Air Emission Inventory applicable throughout the Group for production and sales locations and repair workshops. This contains the definitions of the principles of how we avoid, minimise or eliminate airborne pollutants, noise and odours that arise from our plants or facilities.

Volatile organic compounds (VOCs), in particular those produced in our paint shops, are especially important in this regard. In addition, our furnaces and energy generation systems release nitrogen oxides and sulphur oxides as well as particulate matter. The latter also occurs in the extraction of welding smoke

from the bodyshell areas. All three are also significant air pollutants that must be reduced.

### Technical Compliance Management System

Reducing or completely eliminating air pollutants requires exact knowledge of the processes and the framework conditions. For this reason, Mercedes-Benz Cars & Vans supports its employees in the automotive divisions with a technical compliance management system (tCMS). Its objective is to safeguard compliance with all legal and regulatory requirements throughout the product development and certification process. The tCMS defines values, principles, structures and processes in order to provide our employees with guidance and orientation especially with regard to challenging questions on how to interpret technical regulations.

Mercedes-Benz Cars & Vans has also created dedicated expert units for technical compliance in the development departments of vehicle-related divisions. Among other things, these expert units manage a network of technical compliance contact persons within development and certification departments. This network serves as a link between operating units and the compliance organisation. It supports the development departments in matters of technical compliance. Complex questions regarding technical compliance are evaluated and then decided in an interdisciplinary process that takes into account technical, legal and certification-relevant criteria (tCMS committees).

#### [Compliance with technical and regulatory requirements](#)

Our BPO whistleblower system is also available as a contact partner for reporting technical compliance violations. We have been operating the BPO since 2006. We urge the employees of the Group as well as external parties to report any suspicious facts relating to violations of the laws or of our internal regulations via this system. Examples of such violations include infringements of technical provisions or environmental protection regulations.

#### [The BPO whistleblower system](#)

## Measures

### Measures in the development and production processes

Product design is a central starting point for the Mercedes-Benz Group to improve our performance from the ground up in the area of air pollution emissions. We are continually working on and investing in technologies and measures in order to further improve air quality.

#### New emissions laboratory in operation

The new emissions laboratory in Immendingen (ELI) at the Mercedes-Benz AG Testing and Technology Centre commenced regular operation at the beginning of 2021. Construction of the laboratory had started in summer 2018.

In the ELI, Mercedes-Benz car and van models are metrologically tested on [roller test rigs](#). Conventional emission measurements are carried out on hybrid and combustion-engine vehicles; we test electric vehicles with respect to their electrical parameters such as electricity consumption and range. In addition, mountain drives at altitudes of up to 4,000 metres above sea level and at temperatures ranging from -30°C to +50°C can now be simulated — it is no longer necessary to carry out expensive extreme tests on the road.

The ELI also has additional laboratory and workshop areas that are used, for example, for tests of on-board diagnostics systems and to prepare for [Real Driving Emissions \(RDE\)](#) test drives with the portable emission measurement system.

The test stands initially ran in single-shift operation; this was changed to two-shift operation in September. Approximately 6,000 [roller test rig hours](#) are available per year.

#### Diesel engines cause less nitrogen oxide emissions

The Mercedes-Benz Group has further reduced the NO<sub>x</sub> emissions of its diesel engines. This was possible thanks to an innovative overall package of engine and exhaust gas aftertreatment. We have consistently introduced this solution to the market in the form of the current engine generation OM 654 and 656, and have been continuing its further development since then.

Vehicles with diesel engines of the latest generation have low NO<sub>x</sub> emissions in real driving operation — on many journeys they actually record values according to the RDE measuring process that are significantly lower than the current laboratory threshold limit of 80 mg/km. They achieve average NO<sub>x</sub> emission values of around 20 to 30 mg/km in long-term operation over many thousands of kilometres under RDE conditions.

Replacing the fleet of existing old diesel vehicles with vehicles with the latest diesel technology, which is certified according to the [Euro 6d-TEMP](#) or [Euro 6d](#) standards, is an effective measure to further reduce NO<sub>2</sub> emissions in road traffic. This is shown by our internal study. For this study we installed measuring points at various locations in Germany and carried out detailed modelling of the emission behaviour of our Euro 6d vehicles. This enabled us to very precisely investigate how the emissions effected the NO<sub>2</sub> pollution. The measurements were carried out at what are known as NO<sub>2</sub> hotspots, i.e. locations with particularly high emission levels.

At Mercedes-Benz Cars, the entire new car fleet for Europe has been certified according to the Euro 6d-TEMP standard or better since June 2019 and according to Euro 6d since the fall of 2020 — and thus before this was legally required. As of 1 January 2021 all newly registered cars must conform to the Euro 6d emissions standard. This was made possible by the expanded exhaust gas aftertreatment system using an additional [underfloor SCR catalytic converter](#), as well as other measures.

#### Reduced solvent emissions in production

The Mercedes-Benz Group seeks to be a leader in dealing with the production-related emissions of VOCs in the automotive sector. VOCs — volatile organic compounds — are a group of highly volatile organic hydrocarbons. These substances can easily pass from the liquid to the gaseous phase and are frequently harmful to human health. In automobile production VOCs are primarily released in the vehicle painting process. Different countries use a variety of methods to define and record VOCs; as a result, it is difficult to achieve uniform worldwide documentation. Moreover, the documentation of these emissions must comply with various legislative limit value specifications.

In order to minimise its VOC emissions, Mercedes-Benz AG has concluded a public-law contract with the City of Sindelfingen. This contract stipulates that at the Mercedes-Benz Sindelfingen plant, we may not release emissions of more than 20 grams of VOCs per square metre of painted vehicle surface. Measurements show that the emissions actually released in our plant are much lower than this limit.

### **Measures in the use phase**

IT solutions and intelligent integrated use concepts enable both an efficient drive system and exhaust gas cleaning in addition to a further reduction in pollutant emissions. The Mercedes-Benz Group has also developed comprehensive concepts for air quality in the vehicle cab for the protection of the driver and passengers.

### **Software update improves nitrogen oxide emissions**

The Mercedes-Benz Group develops software updates for all of its diesel vehicles in Europe that are certified according to the Euro 6b and Euro 5 emissions standards. These updates improve the vehicles' nitrogen oxide emissions in real driving operation by an average of between 25 and 30 per cent.

As early as 2017, the Mercedes-Benz Group announced that it would offer voluntary software updates for several million diesel vehicles in Europe. We have in addition been carrying out recalls — during which software updates are also applied — at the order of Germany's Federal Motor Transport Authority (KBA) since 2018. The recalls ordered apply to a number of vehicle models (cars and vans) that comply with the Euro 6b or Euro 5 emissions standards. The voluntary service measure for vehicles that are not included in the recall is meanwhile continuing as planned.

### **Hardware retrofit supported**

Mercedes-Benz Group AG is participating in a hardware retrofit programme for diesel vehicles that was initiated by the German federal government. Specifically, Daimler has agreed to provide a financial subsidy of up to €3,000 (gross) per vehicle for hardware retrofitting if certain conditions are met. The hardware retrofitting must be developed and offered by a third-party supplier and approved by Germany's Federal Motor Transport Authority (KBA). The offer is aimed at private holders of affected

Mercedes models whose primary residence is in a priority region. These regions were defined by the German Ministry of Transport and Digital Infrastructure in 2017.

In the summer of 2019, the KBA approved retrofit solutions for various vehicle models. The retrofitted vehicles must comply with the NO<sub>x</sub> limit value of 270 mg/km in real driving operation under specific conditions. This is intended to guarantee that the retrofitting significantly reduces NO<sub>x</sub> emissions in permanent operation.

In 2019, we set up a special website to make it as simple and fast as possible for our customers to apply for the subsidy. Interested parties can visit this website in order to carry out a non-binding check as to whether they fulfil the precise requirements for receiving the subsidy. Customers can also use this website to request payment of the subsidy after the approved retrofit hardware has been installed.

The air quality in the 15 priority regions has improved demonstrably since 2017. At the Neckartor measuring point in Stuttgart, for example, the annual average NO<sub>2</sub> value for 2020 was below the EU limit of 40 µg/m<sup>3</sup>. The programme will continue until further notice despite the fact that demand for the hardware retrofit has dropped considerably.

### **Mercedes-Benz SUSTAINER actively improves air quality**

Particulate pollution levels due to road traffic play an important role in urban air quality. The SUSTAINER technology platform from Mercedes-Benz Vans, which is based on the eSprinter, was presented in 2021. It brings together a large number of innovative solutions for more sustainable delivery transport — and actively contributes to improved air quality in cities in the process. In addition to a battery electric drive system, the SUSTAINER features two particulate filters on board. These filters compensate for the particulate emissions up to a particle size of ten µm in the vehicle's immediate surroundings by more than 50 per cent — 35 per cent while charging and 15 per cent in driving operation. The underbody particulate filter is positioned close to the rear axle, at the location of one of the highest concentrations of particulates in the vehicle's surroundings. This filter captures the particulates that are stirred up by the SUSTAINER and other vehicles while driving.



The second filter is integrated into the front module and, together with the extractor fan already fitted in the vehicle, filters particulates out of the air. This enables it to also filter the surrounding air at low driving speeds and during the charging process. In addition, low-emission and low-wear brake discs and low rolling resistance tyres with less wear reduce the technology platform's own particulate emissions.

### **Local measures for improving air quality**

Intelligent mobility and logistics concepts can also help to improve the air quality in cities. To this end, the Mercedes-Benz Group has launched some local measures on its own initiative.

We have set up a Corporate Mobility working group at the Sindelfingen location. This group, which meets regularly, deals with the employees' environmentally friendly mobility. The working group met once in each quarter during the reporting year and will be continued in 2022. Internal experts from the technical service (employee mobility), factory planning, works council and plant security have discussed innovative sharing solutions and shuttle services as well as how tried-and-tested solutions can be improved.

A CarSharing app for the fleet was introduced at the Sindelfingen location during 2021. As part of this pilot project employees are able to borrow and return the vehicles in the plant exclusively via the app, without the need for a key handover. The app will be introduced at further plant locations in 2022.

In addition, the working group joined representatives from the Cities of Böblingen and Sindelfingen to examine the accessibility of the Mercedes-Benz plant, i.e. how travel to and from the plant could be made more environmentally friendly for the employees. As a result, several municipal bicycle paths now extend to the gates of the Sindelfingen plant and traffic lights switch more favourably for pedestrians and cyclists.

As part of the local "Mobilitätspakt Rastatt" (Rastatt Mobility Pact) we have above all concentrated on improving the services offered by local public transport. One project addressed the cross-border commuting of employees between Rastatt and the Alsace region as well as the conditions that have to be created so that

the plant can provide cross-border shuttle bus transport for about 700 shift employees. The plans for these shuttle buses are expected to be drawn up by mid-2022.

Furthermore, since October 2021 our employees have also been able to hire electric scooters from an external provider for the journey to the Rastatt plant. The scooters can be parked at the cycle parking facilities outside the plant site — the plant has made this possible specially for the provider. The conditions for the hire of the electric scooters are determined by the provider. More and more employees have now made use of the electric scooters. Because this reduces the number of road kilometres driven, it can also contribute to reducing pollutant and CO<sub>2</sub> emissions and ensuring a smoother flow of traffic within cities.

### **Reducing internal emissions and allergens**

Clean air and allergy-tested surfaces in vehicle interiors are very important for the safety and comfort of the occupants. During the model development stage, the Mercedes-Benz Group therefore makes sure that emissions in the interior and allergens are reduced. We also use filters in the air conditioning system to prevent the intake of allergens. Since 2016, many of our car model series have borne the seal of quality of ECARF, the European Centre for Allergy Research Foundation, for their interiors. The ECARF seal is awarded to products whose anti-allergenic properties have been demonstrated in scientific studies.

The following measures are also helping to reduce interior emissions and allergenic substances in our vehicles:

- Further development of the delivery specifications with regard to emissions and odours in vehicle interiors — including limit values for suppliers
- Continuous component optimisation and further development of the materials and manufacturing processes used for interior components
- Monitoring of interior emissions by means of measurements in the in-house vehicle testing chamber

## Effectiveness and results

### The effectiveness of our management approach

GRI 103-3

The Mercedes-Benz Group regularly checks the plants' compliance with the internal and external environmental protection requirements and reporting obligations as part of the environmental management activities at its production facilities. Among other things, checks are carried out to see whether the plants' operations are in compliance with the laws regarding airborne emissions. In the event of any incidents relevant to environmental protection occurring, we document them and take all necessary measures to eliminate possible damage. The management system is monitored both by external auditors as part of the certification process (ISO 14001, EMAS) and by internal environmental risk assessments (environmental due diligence process).

The Mercedes-Benz Group takes the pollutant emissions of its vehicles into account at an early stage of the development process. We specify particular characteristics and target values for every vehicle model and every engine variant in the documentation that accompanies the development process. We also use these specifications to assess the milestones we reach in the course of product development. For this purpose, we compare the current status of a project with the target values and take corrective measures if necessary.

### Results

Due to their low emissions, our current Mercedes-Benz vehicles that comply with the emissions standard Euro 6d only have an extremely small effect on NO<sub>2</sub> pollution in cities. The results are based on measurements of NO<sub>x</sub> emissions and detailed modelling of the NO<sub>2</sub> immission in local areas subject to high traffic. One point shown by the data is that if every one of the 60,000 vehicles that pass the Neckartor in Stuttgart every day were replaced by a Mercedes-Benz vehicle with emissions standard Euro 6d, the NO<sub>2</sub> emissions from the year 2019 would be reduced from 28 µg/m<sup>3</sup> to below 2 µg/m<sup>3</sup>.

### Settlement of the legal dispute concerning diesel emissions

GRI 307-1

During 2020, Mercedes-Benz Group AG — formerly Daimler AG — and its subsidiary Mercedes-Benz USA LLC (MBUSA) took another important step toward legal certainty in connection with various diesel-related proceedings in the United States. After the US regulatory authorities approved a settlement of civil and environmental claims in September 2020, this settlement was approved by the United States Federal Court for the District of Columbia in the course of the reporting year. With this court approval, the settlement has now taken effect. The regulatory proceedings regarding the emission control systems of approximately 250,000 diesel vehicles in the United States have thus come to a conclusion.

Mercedes-Benz Group AG has cooperated with the United States regulatory authorities to the fullest extent during the investigation of these events. We did not receive any Notice of Violation from the [EPA](#) or the [CARB](#) in the course of these proceedings. In contrast to the settlement agreements of other manufacturers, we were also not placed under the supervision of an external compliance monitor.

As is specified in the settlement agreements, Mercedes-Benz Group AG and Mercedes-Benz USA LLC contest the allegations of the authorities and the claims of the consumers participating in the class action and do not admit to any liability to the United States, California, the plaintiffs, or in any other way. The settlements conclude the pending civil proceedings against Mercedes-Benz Group AG by the US authorities without establishing whether functionalities in the vehicles are inadmissible defeat devices.

On the basis of the existing compliance programme, Mercedes-Benz Group AG consolidated its existing processes and structures into a Group-wide technical Compliance Management System (tCMS) in 2016, and has since then instituted a series of measures to reinforce technical compliance. We have invested in the necessary resources and created positions in order to carry out these measures. The elements of the tCMS are listed in the Compliance Operating Plan, which is an annex to the settlement agreement with

the US government. As part of the settlement with the US authorities, Mercedes-Benz Group AG promised to continue developing its present tCMS.

A detailed description of the institutional proceedings related to diesel emissions can be found in the company's risk reporting.

[🌐 Risk and Opportunity Report, AR 2021](#)

The European Commission, Mercedes-Benz Group AG and other German car manufacturers also agreed on a settlement during the reporting year and thus concluded the proceedings regarding anti-competitive behaviours in connection with the development of SCR catalytic converter systems for cars with diesel engines. The proceedings related to the period between 2009 and 2014.

## Airborne emissions (in t)

**GRI 305-7**

	2017	2018	2019	2020	2021 <sup>1,2</sup>
Solvents (VOC)	7,735	7,929	7,506	6,483	<b>3,780</b>
Sulphur dioxide (SO <sub>2</sub> )	57	61	60	40	<b>13</b>
Carbon monoxide (CO)	2,203	2,515	1,962	1,502	<b>1,269</b>
Oxides of nitrogen (NO <sub>x</sub> )	1,185	1,050	1,568	1,349	<b>625</b>
Dust (total)	150	182	228	270	<b>149</b>

<sup>1</sup> These data include Mercedes-Benz Cars & Vans. The spin-off and hive-down of the Daimler commercial vehicle business as an independent company makes it impossible to compare these data with the data from the previous years.

<sup>2</sup> These data have been adjusted due to the spin-off and hive-down of the Daimler commercial vehicle business as an independent company, nonetheless, they still contain minor uncertainties as adjustments for combined locations and units can first be made in financial year 2022.



# Resource conservation

## Materiality and goals

GRI 103-1/-2

Target	Target horizon
Proportion of secondary raw materials per vehicle <sup>1</sup>	2030
– Cars + 40%	
– Energy consumption per vehicle <sup>2</sup>	2030
– Cars – 43%	
– Vans – 25%	
– Water consumption per vehicle <sup>2</sup>	2030
– Cars – 33%	
– Vans – 28%	
– Waste for disposal per vehicle <sup>3</sup>	2030
– Cars – 82%	
– Vans – 85%	

<sup>1</sup> On average for the Mercedes-Benz car fleet without smart and vans  
<sup>2</sup> In production, as compared to the average for 2013/2014  
<sup>3</sup> In production, as compared to 2018

The worldwide consumption of resources is growing — with negative consequences for the environment and society. That's why the goal of the Mercedes-Benz Group is to increasingly decouple our consumption of resources from the growth of our production volume. We intend to reduce our use of resources per vehicle. Our objective here is to help promote both economic growth and sustainability. Our plan can only succeed if

we systematically conserve resources and continue to close recycling loops. For example, we are increasingly using secondary materials and renewable raw materials in our vehicles. In order to also reduce our energy and water consumption and waste generation, we are constantly working to make our production processes more efficient and more environmentally friendly.



# Resource-efficient vehicles

## Strategy and concepts

### Decoupling resource consumption from growth

GRI 103-1

The global economy is growing, and the demand for mobility is increasing. These trends are accompanied by intensified resource consumption that can be detrimental to the environment and society. For example, in many cases the extraction and further processing of primary raw materials is energy-intensive and leads to the emission of pollutants into water, soil and air. No less important is the fact that the use of natural resources also harbours social risks. A fair distribution of raw materials, secure access to clean drinking water, and preventing the violation of human rights in the course of raw material extraction are only a few of the problematic issues.

Today the vehicles of the Mercedes-Benz Group mainly consist of materials such as steel, iron, aluminium and plastic. These materials are expected to be still available in sufficient amounts in the future. However, natural resources are required for their production. We want to keep this consumption of natural resources as low as possible. Our scrap aluminium, for example, is recycled and reused among others in our vehicles via the material cycle. We are also continuing to work on creating completely closed cycles in this area. This will not only conserve valuable resources but also reduce CO<sub>2</sub> emissions, because large amounts of energy are needed for aluminium smelting.

Battery-electric drive systems are a key stage on the way to achieving CO<sub>2</sub> neutrality. The expansion of electric mobility is causing changes in the requirements for specific raw materials. Examples include cobalt and lithium as well as nickel, graphite, manganese and copper in varied amounts. We evaluate these raw materials in comprehensive raw material assessments in order to counteract potential risks for the environment and

human rights. In addition, we have a long-term supply strategy for all of the raw materials that we procure directly or indirectly. In the case of critical raw materials, the strategy focusses on in-depth research into substitution technologies and on ensuring raw materials are responsibly procured.

Moreover, we have invested in resource-efficient technologies and production processes for batteries for several years, and we are working on further decreasing the use of critical materials. For example, cobalt accounts for less than 10 per cent of the cathodes of the battery cells in the EQS. This is a much lower amount than in the previous battery generation. Our objective is to dispense with materials such as cobalt altogether by using post-lithium-ion technologies with new material compositions. Our holistic battery strategy also aims to further optimise recyclability and implement the related measures.

#### ➤ Battery development

As a result, the Mercedes-Benz Group's vision is to transform its entire value chain into as closed a cycle as possible. One of the ways to do this is to return our production waste and end-of-life materials to the material cycle. The same applies to the batteries from electric vehicles, which still contain a great deal of valuable materials. The recycling and reuse of these and many other raw materials is the focus of our current strategic activities and will remain so in the future. It's equally important and necessary to integrate our suppliers even more closely into our processes — for example, through dialogues and clearly defined targets. We are also actively engaged in various initiatives that, among other things, have set themselves the goal of reducing the resource consumption of important raw-material industries.

### Resource use

GRI 103-2 GRI 301-1

At the Mercedes-Benz Group, the units that are mainly responsible for resource conservation are vehicle con-

cepts, vehicle development, procurement, production planning and production. We make decisions concerning these areas in the specialist committees responsible for the respective model series. These committees consist of the respective subsection representatives and expert groups such as those dealing with specific groups of materials. Corporate management is always involved in fundamental decision-making regarding design concepts, manufacturing technologies and the utilisation of materials. When making such decisions, the management takes multiple factors into account. These include costs, resource-efficient technologies, the use of alternative materials such as secondary materials and renewable raw materials and the potential for industrialisation. During this process, the company's management examines to what extent the results of development can be transferred to large-scale industrial production, for example with regard to the use of raw materials.

## Decoupling

Global  
vehicle sales



Promoting the circular economy  
Reducing resource consumption



Resource consumption

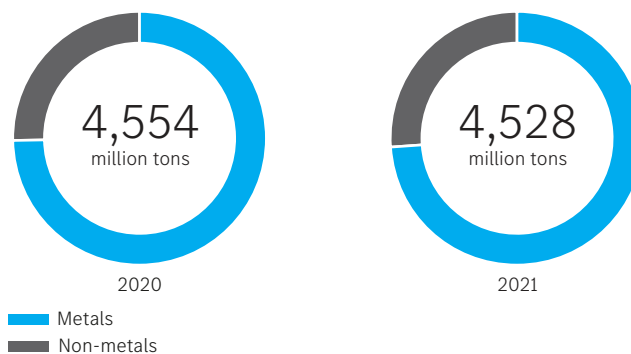
Time

Mercedes-Benz Cars & Vans consumes around 4.5 million tons of raw materials each year to manufacture its products. Some of these substances can be categorised as scarce or critical. We focus especially on the continuous reduction of the amount of these raw materials that is needed per vehicle. To this end, we are already using the “Design for Environment” approach during the vehicle development stage. This means that we design our vehicles to be as resource-conserving and environmentally friendly as possible over their entire life cycle. The cornerstones of this approach are life cycle assessments, lightweight engineering, the use of [recyclates](#) and recycling.

## Materials — use of metals & non-metals

GRI 301-1

Use of metals and non-metals



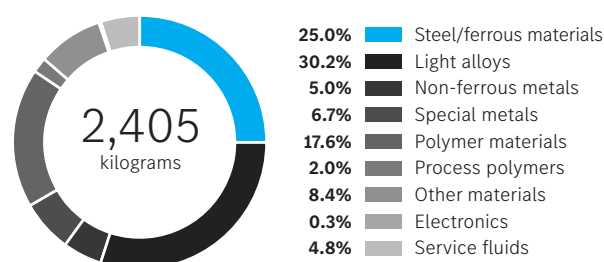
## Making life cycle assessments

Mercedes-Benz Cars & Vans makes life cycle assessments to determine the environmental compatibility of its vehicles. We systematically examine a vehicle's environmental effects throughout its entire life cycle — from the extraction of raw materials and vehicle production to product use and recycling. In order to evaluate its resource efficiency, we take a number of additional factors into account, such as the medium-term and long-term availability of raw materials, acceptance by the public and the vehicle's various social and environmental effects and risks. We also use life cycle assessments in our development work, to evaluate and compare different vehicles, components and technologies.

[Life cycle assessment of the EQS 450+](#)

## Material composition EQS 450+<sup>1</sup>

GRI 301-1



(values are rounded)

<sup>1</sup> WLTP: EQS 450+ combined electrical consumption 19.8-15.7 kWh/100 km, CO<sub>2</sub> emissions 0 g/km; Electricity consumption was determined on the basis of Regulation 2017/1151/EC.



### Identifying critical raw materials

Several types of raw materials that are needed for the production of electric vehicles are associated with certain risks. In order to better assess how critical the use of a raw material is or can become, Mercedes-Benz Cars & Vans teamed up with partners from industry and science in 2015 to conduct the ESSENZ research project. The result has been a holistic approach that our engineers are already following in the early phases of vehicle development. The use of the ESSENZ method is based on the life cycle assessment methodology, which makes it possible to systematically analyse the environmental effects of a vehicle along its entire life cycle. The ESSENZ approach not only examines the geological availability of a raw material but also takes socio-economic factors and social and societal risks into account.

### Resource conservation along the supply chain

**GRI 103-1/-2** **GRI 308-1**

The supply chain plays an important role in our efforts to conserve resources. Mercedes-Benz Group AG wants to decouple resource consumption from economic growth. To achieve this goal, it is relying on the support of its suppliers. With their help, we want to continuously increase the proportion of secondary and renewable materials in our vehicles.

We also expect our suppliers of production materials to operate with an environmental management system that is certified according to ISO 14001 or EMAS. Depending on the specific risks, this also applies to suppliers of non-production materials, such as painting services. If a supplier does not have a certified environmental management system, the supplier is given two years to set up such a system and have it certified. If this is not done, the supplier may be excluded from receiving new orders. We also request that our suppliers adhere to the [Supplier Sustainability Standards](#) and the associated environmental aspects.

In view of this, Mercedes-Benz AG carried out a risk analysis in 2018 that identified steel, aluminium and plastics as especially important materials. We need large volumes of these materials for the production of our vehicles, and their extraction and processing also consume large amounts of energy and resources. In 2020, Mercedes-Benz AG defined secondary material targets for these resources for Mercedes-Benz Cars & Vans

and incorporated these targets in all contract award requirements.

[Production materials: Cooperation with the suppliers](#)

## Measures

### Battery development

Batteries are a key component of electric mobility. At the Mercedes-Benz Group, experts from a variety of disciplines deal with all aspects of this storage technology, ranging from fundamental research to production maturity.

We have invested in resource-efficient technologies and production processes for batteries for several years. Moreover, we are continuously working to optimise the current lithium-ion battery. Here we are pursuing two goals: we want to steadily reduce the use of critical materials such as cobalt in our batteries, and we also want to only procure battery cells containing cobalt and lithium from audited mines. For example, our suppliers will procure raw materials for battery components exclusively from mines that have been audited in accordance with the Standard for Responsible Mining of the [Initiative for Responsible Mining Assurance \(IRMA\)](#).  
[Stakeholder involvement](#)

We are working hard to develop low-cobalt or cobalt-free technologies that conserve our resources. The production of the batteries also plays an important role in the holistic assessment of the value chain. As a result, Mercedes-Benz Group AG has signed agreements with two strategic battery cell suppliers, stipulating that it would only procure CO<sub>2</sub> neutral battery cells from 2021. Our holistic battery strategy also aims to further optimise recyclability and implement the related measures.  
[CO<sub>2</sub> neutral production materials](#)

New technologies enable us to consistently reduce the consumption of raw materials while maintaining long ranges. This is impressively demonstrated by our VISION EQXX technology vehicle. Moreover, the Mercedes-Benz Group is conducting research on next-generation alternative battery systems with the aim of shortening development cycles, improving the energy density of our batteries and reducing charging times.

The Mercedes-Benz Group is systematically expanding its research and development activities so that new technologies can be used in series production as early as possible. For example, we are steadily increasing our expertise regarding the technological evaluation of materials and battery cells.

However, we also rely on strong partnerships and cooperative ventures. For example, we are cooperating with the Chinese company Contemporary Amperex Technology Co. Limited (CATL) to drive forward the development of current and future battery technologies, which will be used in many Mercedes-Benz vehicles in the years ahead. In cooperation with Sila Nano, we are working on increasing the energy density of lithium-ion batteries. We want to achieve this goal by increasing the proportion of silicon in the anode. In November 2021, we also formed a partnership with Factorial for the development of solid-state battery technology. In this partnership, the two companies want to jointly develop cutting-edge battery technologies that range from the cell and the modules all the way to the integration in the vehicle battery. The first prototype cells are to be tested in 2022.

Moreover, the introduction of a modular battery architecture in the EQS already enables our customers to adjust the energy content and thus the range to their needs. We will continue this strategy for the upcoming compact and mid-range automobile platform.

## Recycled and renewable raw materials

### GRI 301-2

The closing of material cycles and the use of renewable raw materials are key measures for the responsible utilisation of resources. In order to achieve these goals, the Mercedes-Benz Group uses resource-efficient technologies and production processes. We are also increasingly using secondary materials and renewable resources in our vehicles.

Mercedes-Benz has set itself the target of increasing the share of secondary raw materials in its car fleet to an average of 40 per cent by 2030. Since 2005, Mercedes-Benz has also ensured transparency concerning which products secondary raw materials are used in. We use [environmental certificates \(360° Environmental Check\)](#) that are open to public view for

this purpose. Among other things, these certificates show which components are partly made of resource-conserving materials.

## Use of recyclates

Mercedes-Benz uses many components made of recycled materials in its products, depending on the specific vehicle variant and the technical requirements.

One example of this is the all-electric Mercedes-Benz EQC (EQC 400 4MATIC: NEDC: Combined electrical consumption: 21.9–19.4 kWh/100 km; CO<sub>2</sub> emissions combined: 0 g/km)<sup>1</sup>. Customers can order this vehicle with seat cover textiles made of 100 per cent recycled PET bottles. A total of 43 major components that are mostly made of plastic, such as wheel arch linings and underbody panelling, have been replaced with recycled materials. This also applies to a multitude of small parts such as pushbuttons, plastic nuts and cable fasteners. Altogether, we manufacture components with a total weight of 36.9 kilograms partly from recycled materials.

The EQS contains over 80 kilograms of components made of resource-conserving materials. In May 2021, the Hamburg plant began series production of an injection-moulded load compartment cavity for the EQS. It marked the first time that this component was manufactured from such materials for the EQS. An innovative hybrid injection-moulding process (SpriForm) is used to make the component, 60 per cent of which consists of recyclates. Moreover, polypropylene plastic (PP) can be easily recycled, which conserves resources. In the new E-Class, 80 per cent of the bottom of the load compartment cavity is to be made of recyclates.

In May 2021, we switched the floor coverings of the EQS to [tufted velour](#), a new recycling yarn. It consists of regenerated nylon and is made from waste nylon, such as old fishing nets, fabric remnants from mills, and carpets. It has the same properties as nylon made of new raw materials. By using regenerated nylon, we are reducing CO<sub>2</sub> emissions and also closing material cycles.

In order to further promote the creation of a circular economy, we also teamed up with UBG Materials in 2020.

<sup>1</sup> Electricity consumption was determined on the basis of Commission Regulation (EC) No 692/2008.

This Israeli startup turns previously non-recyclable household waste into a filler for plastics. This substitute material for plastic is completely recycled and recyclable. It will soon be used for the series production of various plastic components such as cable ducts.

In May 2021, UBQ Materials and Mercedes-Benz AG received the Sustainability Award in Automotive 2021 in the “Best Startup” category. The two companies received the award for their joint work on the development of sustainable car parts. The Sustainability Award in Automotive honours companies whose products, processes and initiatives have a positive and holistic influence on the sustainability of the automotive industry and make a major contribution to at least one of the UN’s 17 Sustainable Development Goals.

The use of recycled materials is also receiving increased political support. For example, the European Commission has supplemented the European End-of-Life Vehicles Directive 2000/53/EC with the European plastics strategy, which requires more recycled materials to be used in vehicle production. Ever since 2000, our specifications for new Mercedes-Benz cars have required a minimum proportion of components containing recycled materials. This proportion varies depending on the vehicle’s model and series.

In order to further promote the use of recycled materials, the Mercedes-Benz Group is encouraging its experts to share information with one another and with suppliers of automobile components and recyclates. Before contracts are awarded and during the joint design of components, suppliers of the Mercedes-Benz Group have to present newly developed recycled materials and determine whether it is possible to switch components to the use of recyclates. Technical issues can be directly discussed.

### **Use of renewable raw materials**

The Mercedes-Benz Group can also reap many benefits from the use of renewable raw materials. By using them we can reduce the weight of components. Moreover, their CO<sub>2</sub> balance is almost neutral when their energy is recovered, because only as much CO<sub>2</sub> is released as was absorbed by the plant during its growth. Last but not least, renewable raw materials help to reduce the consumption of fossil resources. We utilise a broad

range of renewable raw materials such as hemp, kenaf, wool, paper and natural rubber.


The new Mercedes-Benz S-Class shows how many components can be partially manufactured from renewable raw materials. For the interior we developed a microsandwich material that is reinforced with natural fibres in many components. It is used in the map pockets in the door trims, in the tensioning part of seat backrests and for the rear shelf. This material weighs 40 per cent less than a comparable conventional component. The lower weight leads to a decreased need for primary energy along the vehicle’s path from production to use and finally to the end-of-life phase. Moreover, the material, which is made of natural fibres, is very break-resistant and thus contributes to vehicle safety.

Another example is the SUSTAINEEER, which is based on the eSprinter. This technology platform has underbody panelling made of recycled polypropylene, scrap tyres and the filler UBQ, which, in turn, is manufactured from recycled household waste. These panels are recyclable and biodegradable. In addition, they contain no formaldehyde and can be coated to make them waterproof. All of the wood elements are FSC®-certified. This means that the wood comes from sustainably managed forests.

### **Lightweight engineering**

Intelligent lightweight construction can reduce the weight of a vehicle without compromising our high standards of safety and comfort. This means that we need to select the right materials. Component design and manufacturing technology also play an important role. At 35 per cent, the bodyshell accounts for the biggest share of the total weight of a car with a conventional drive system. This is followed by the suspension at 25 per cent, the comfort and safety equipment at 20 per cent and the engine and transmission at 20 per cent. Thus the most effective approach is to focus on the vehicle’s bodyshell.

Aluminium is especially ideal for lightweight construction because it is light, stable and has other positive properties. For the bodyshell, the Mercedes-Benz Group is increasingly using aluminium alloys for exposed automotive panelling (bonnet, wing, roof, boot lid) and reinforcement components (inner part of the bonnet, roof reinforcements).

The new Mercedes-Benz S-Class offers a look at what can already be achieved with a holistic lightweight construction concept. It makes the vehicle up to 65 kilogram lighter than the predecessor model. The bodyshell is produced by means of an aluminium-steel hybrid construction process. Mercedes-Benz has significantly increased the percentage of aluminium in this process compared to that of the predecessor model; all of the components except for the main floor now consist of aluminium. By comparison with the predecessor model series, the bodyshell of the new S-Class is 30 kilograms lighter. The brand has also paid particular attention to the topic of  “**unsprung mass**”. As a result, weight-optimised and aerodynamic aluminium rims that can further reduce fuel consumption are now available for the S-Class.

## Production materials: Cooperation with the suppliers

### GRI 308-2

Mercedes-Benz AG is continuously cooperating with its suppliers to develop materials and alloys that contain as high a proportion of secondary materials as possible in order to reduce the use of primary materials. We are also involved in a dialogue with them in order to prevent other sustainability-related risks. For example, we explicitly oppose all forms of illegal deforestation.

## Aluminium

Aluminium is not only lightweight but can also be recycled many times without a loss of quality. Moreover, its recycling process requires only about five per cent of the energy that would be needed to produce new aluminium. That's why Mercedes-Benz AG is making increased use of this light metal and is working together with its suppliers to create aluminium alloys that contain a proportion of scrap. For example, we developed aluminium alloys that contain recycled scrap aluminium from sources such as end-of-life vehicles, façade panels or packaging — known as end-of-life scrap. At the same time, they also meet the high standards for properties such as crash resistance, durability and corrosion resistance that Mercedes-Benz AG requires for alloys used in structural die-cast components. The body of the upcoming Mercedes AMG-SL contains selected cast components made of such a secondary aluminium alloy. This reduces the CO<sub>2</sub> emissions from aluminium production by more than 90 per cent. In addition to the increased use of recycled aluminium, Mercedes-Benz AG also ensures that

the primary material is sustainable. For example, suppliers of the European foundries and press shops will only be awarded contracts in future if the primary aluminium used comes from sources certified by the Aluminium Stewardship Initiative (ASI) — i.e. if it has been certified according to the ASI standard from the mine to the rolling mill. Moreover, we are already procuring CO<sub>2</sub>-reduced material for our foundry in Mettingen.

### Involvement in raw material initiatives

#### Aluminum supply chain

## Steel

Mercedes-Benz AG is working together with its steel suppliers to make the steel supply chain more sustainable. In doing so, we are consciously focussing on the avoidance and reduction of CO<sub>2</sub> emissions rather than on offsetting carbon emissions.

In 2021, Mercedes-Benz became the first automaker to participate in the Swedish startup H2 Green Steel (H2GS). As the startup's preferred partner, we want to launch CO<sub>2</sub>-free steel in a variety of vehicle models from as early as 2025. This will be another important step in the direction of CO<sub>2</sub> neutrality. H2GS produces CO<sub>2</sub>-free steel by using hydrogen and electricity from exclusively renewable sources. By way of comparison, the conventional blast-furnace process generates on average more than two tons of CO<sub>2</sub> for every ton of steel produced.

Since 2020 we have been procuring steel from the US manufacturer Big River Steel. Through the use of recycled scrap steel and renewable energies, this steel reduces the CO<sub>2</sub> emissions from steel manufacturing for Mercedes-Benz products by more than 70 per cent compared to the conventional blast-furnace process.

Since 2021 Mercedes-Benz has also been procuring more environmentally friendly flat steel products from Salzgitter Flachstahl GmbH. CO<sub>2</sub> emissions have been decreased by more than 60 per cent compared to the conventional steel production process. This significant CO<sub>2</sub> reduction is achieved through the use of almost 100 per cent scrap metal in an electric steel-melting shop.

In 2021 we also formed a partnership with the Swedish manufacturer SSAB AB for the delivery of CO<sub>2</sub>-free steel for our products. Together the partners are already laying the groundwork for putting green steel into vehicles

as soon as possible. The first prototype body parts made of CO<sub>2</sub>-free steel are already being planned this year.

### Leather

Mercedes-Benz clearly positions itself against all forms of illegal deforestation. We request from our suppliers that the supply chains of the products that we procure from them do not cause any kind of illegal clear-cutting and do not threaten or destroy high conservation value forests. This is also specified in our awarding requirements.

During the reporting year, we entered into a dialogue with all of our leather suppliers in order to identify sustainability-related risks (e.g. illegal deforestation) and where necessary promote the implementation of improvement measures. In addition, all of our leather suppliers have confirmed in writing that their leather comes from cattle that live outside the regions Amazônia, Cerrado, Pantanal, Gran Chaco, Mata Atlântica and Chocó-Darién in South America, where the danger that they graze on illegally cleared forest areas is very high. Only a small percentage of the leather in our supply chains comes directly from Brazil. We are currently examining various measures for addressing risks related to the procurement of leather from Brazil.

We take information about violations of our requirements seriously and investigate them.

## The circular economy

### GRI 301-3

The overarching goal of the [circular economy](#) is to maintain the value of products, components and materials as long as possible. This basic principle has also been embedded in EU legislation since 2015. The Mercedes-Benz Group too is increasingly depending on measures that promote the circular economy. In doing so, we employ a [hierarchy of waste](#). The top goal is to avoid waste. In order to reach this goal, we are working to extend the service life of all vehicle components — for example, by using especially long-lasting materials. We are also using resources efficiently and reducing the use of raw materials that are only available in limited amounts. Only then do we move down the hierarchy of waste to measures for reusing various components and parts and for recovering materials by means of recycling.

### Reuse — new life for used parts

The Mercedes-Benz Used Parts Center (MB GTC) is an important element of the recycling chain for keeping raw materials within the business cycle. This captive specialist enterprise was founded in 1996 and dismantles more than 5,000 vehicles each year, ranging from end-of-life automobiles to preowned vehicles and vehicles that have been wrecked in an accident. Our experts inspect the used parts, which have to meet the same high quality standards as new components. They are then sold to workshops and end customers so that they can be used for [fair-value-based repairs](#).

Used parts that do not pass the strict quality inspections are not reused as spare parts. If that is the case, we aim to regain important materials such as copper from wires, gold from connector contacts and platinum and rhodium from [catalytic converters](#). In addition to precious metals, many components also contain aluminium and iron scrap, glass (panes) and plastic. Even used tyres can be reused as [aggregate](#) in road construction.

### Remanufacturing — value retention for prolonging life

In remanufacturing, the Mercedes-Benz Group reconditions used vehicle parts in order to subsequently reuse them. In the process, the used Mercedes-Benz genuine parts for cars, vans and trucks are reconditioned in such a way that their functionality, safety and quality correspond to those of a new part. The vehicle parts are only recycled when they can no longer be reused in a vehicle.

Remanufacturing makes it possible to avoid waste, conserve raw materials and reduce energy consumption. A calculation certified by TÜV SÜD shows that remanufacturing a Type NAG2 transmission saves about 215 kilograms of CO<sub>2</sub> and 3,074 MJ (854 kWh) of energy compared to a new part.

### Re-utilisation of high-voltage batteries

The lithium-ion battery is the centrepiece of the electric vehicle. However, the production of the battery requires a great deal of energy. Besides, lithium-ion batteries contain a number of valuable raw materials such as lithium and cobalt. For this reason, the Mercedes-Benz Group strives to reuse batteries before they are recycled. Reprocessing a used battery consumes much less energy and raw materials than producing a new one.

And every reprocessed battery reduces the volume of waste, because it forestalls the production of a new battery to meet the demand for spare parts or other applications.

Defective batteries are reprocessed for reuse in vehicles. Because of our high quality standards, this is the fate of most of the batteries that are sent to our central reprocessing plant in Mannheim. After being reprocessed in line with the requirements of series production, the batteries' function and quality are closely inspected. Batteries that are no longer suitable for reuse in a vehicle — for example, because of a reduced capacity — can be reused in a stationary energy storage unit. This is how we improve the life cycle assessment of electric vehicles while also contributing to the establishment of a sustainable energy industry. Mercedes-Benz Energy GmbH, based in Kamen, Germany, is a subsidiary of Mercedes-Benz AG and responsible for the development of such innovative energy storage solutions. It uses the automotive battery technology that is employed in the electric and hybrid vehicles from Mercedes-Benz and smart. By creating stationary energy storage units, Mercedes-Benz Energy GmbH and its partners from the energy industry are, in a sense, taking batteries out of electric vehicles and connecting them to the grid. The spectrum of Mercedes-Benz Energy's large-scale storage systems ranges from **units for offsetting peak demand** and black starts (ramping up a power station independently of the grid) to the uninterrupted supply of electricity. The company especially focusses on second-life applications and spare-part storage units. Many energy storage units of this kind, with a total capacity of more than 95 MWh, are already operating in Germany.

The first second-life battery storage system went online in Lünen, Westphalia in October 2016. Battery systems that have yet to be installed in electric vehicles, and have instead remained in stock as spare parts, can also be used as energy storage units. The energy storage units in Hanover and Elverlingsen are examples of this. Moreover, a partnership agreement for the use of stationary energy storage systems for hydroelectric power plants was signed in December 2020 by Mercedes-Benz Energy and ANDRITZ Hydro GmbH, a subsidiary of the international technology group ANDRITZ AG.

In addition to various large-scale projects, Mercedes-Benz Energy has, since 2020, been offering a flexible container storage system, the Mercedes-Benz energy storage unit. The electricity supply of Factory 56 in Sindelfingen demonstrates a use case for this energy storage solution. A pilot plant of this system at Factory 56 was the first innovative direct-current system to be installed at a Mercedes-Benz facility to feed electricity directly into the plant's direct-current network without any inverters and losses. A stationary energy storage unit consisting of vehicle batteries with a total capacity of 1,400 kWh is connected to the direct-current system. It can also store solar energy and release it on overcast days. The hall is also supplied with electricity purchased from renewable energy sources.

### **Recycling — keeping the end in mind from the very start**

#### **GRI 306-4**

When developing products, the Mercedes-Benz Group keeps the circular economy in mind from the very start, and it prepares a recycling concept for each new vehicle model. This process includes analysing all the components and materials to find out how suitable they are for the various stages of the recycling process. As a result, all Mercedes-Benz car models are 85 per cent recyclable in accordance with ISO 22628. They also comply with the European End-of-Life Vehicles Directive 2000/53/EC, which specifies that 95 per cent of the materials in cars and vans with a gross vehicle weight of up to 3.5 tons have to be capable of being reused or recovered.

### **Mercedes-Benz recycles drive batteries**

Once it is no longer possible to recondition or reuse a battery, it is recycled in order to recover valuable raw materials. Today we are already able to go far beyond the recycling quotas that are prescribed for drive batteries by the battery law. The battery housings, the cables and the busbars can be recycled without any difficulty. Recycling the battery modules, which contain most of the valuable materials, is somewhat more complicated. The processes already exist, but they still need to be further developed so that the valuable raw materials can be recovered in as pure a state as possible.

The basic goal is to increase recycling rates even further. The vision is to use the old batteries of today as a

“raw materials mine” for the batteries of tomorrow. In order to reach this goal, Mercedes-Benz is involved in the research and development of new recycling technologies and promotes their establishment on the market. We are cooperating with specialised partner companies to further optimise the recycling process, and we are also participating in sponsorship and research projects.

The number of batteries to be recycled will rise steadily as electric vehicles increasingly penetrate the market. In view of the life cycle of electric vehicles, we expect significant amounts of recyclable material to become available in the 2030s. To enable this potential to be used as effectively as possible, we plan to build a battery recycling factory at our location in Kuppenheim. Our aim is to create and secure recycling capacities and the related expertise. The production launch is scheduled for 2023, depending on the results of our promising talks with the authorities.

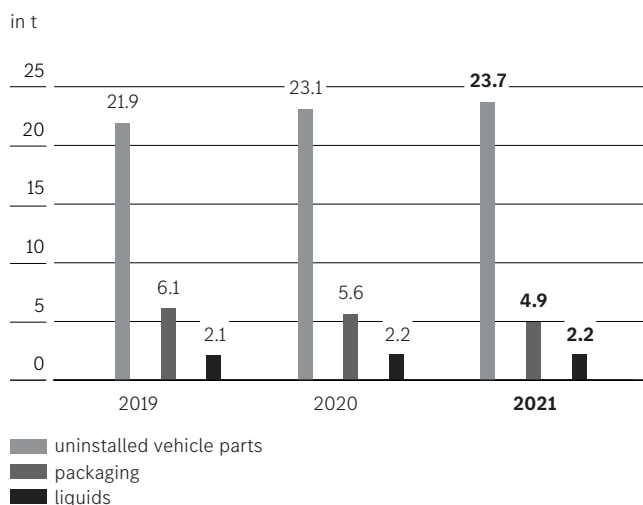
framework of the Mercedes-Benz development system. Mercedes-Benz is currently cooperating with the development unit and with procurement to optimise the related processes and the data quality.

## Results

**GRI 306-5**

Waste material created during the maintenance or repair of our vehicles is collected and recycled via MeRSy — Mercedes-Benz Recycling System, our system for the management and disposal of workshop waste (uninstalled vehicle parts, liquids and spare parts packaging). During the reporting year, MeRSy collected a total of 23,700 tons of uninstalled vehicle parts, 2,200 tons of liquids and 4,900 tons of packaging and forwarded them for recycling.

### Removal of workshop waste with MeRSy



## Effectiveness and results

### The effectiveness of our management approach

**GRI 103-3**

In its management approach to resource conservation, the Mercedes-Benz Group aims to increasingly decouple resource consumption from sales growth. To this end, we have defined the guidelines in our vehicle specifications and introduced the corresponding measures. The goals and guidelines are being observed within the



# Resource conservation in production

## Strategy and concepts

### More environmentally friendly production

GRI 103-1

Not only the use of resources in the vehicle but also the consumption of resources in production plays an important role in the environmental compatibility of vehicles. For this reason, the Mercedes-Benz Group is working continuously to make production more efficient and more environmentally friendly. In order to reduce the environmental footprint of our production processes, we want to use less water, energy and raw materials.

One important lever for reaching this goal is our measures to increase our energy efficiency. By becoming more energy-efficient we decrease our energy consumption and conserve resources while reducing the CO<sub>2</sub> emissions of our production processes. We also want to reduce our water consumption — for example, by closing water cycles. Conserving resources also means reducing waste volumes. Accordingly, we are intensifying our efforts to use lower volumes of raw materials and other materials at our locations.

### Group-wide resource management

GRI 102-29/-30/-31 GRI 103-2

Shrinking the environmental footprint of our production processes is an integral part of our business strategy. In order to ensure efficient, high-quality, legally compliant and environmentally friendly manufacturing operations, we have established environmental management systems in accordance with EMAS or ISO 14001 at our production locations. Since 2012 we have also introduced energy management systems certified in accordance with the DIN EN ISO 50001 standard at our German production locations. These energy management systems are certified at regular intervals. We are currently also implementing ISO 50001 systems at a number of individual locations outside Germany. In accordance with the standard, we have embedded environmental and energy management within our organisation. By means

of these systems we aim to achieve efficient, high-quality production processes that are also environmentally compatible, safe and in conformity with the law. The individual divisions and production locations are similarly responsible for the conservative use of resources. They set overarching and location-specific targets and report on these topics to the respective management. This procedure is the result of our system of targets, which was adopted by the Board of Management as a component of the sustainable business strategy.

Among other things, these environmental and energy management systems ensure clear areas of responsibility as well as transparent and standardised compliance with internal and external regulations for environmental protection and energy efficiency. In addition, they ensure that our production facilities worldwide engage in comprehensive reporting. Within the framework of our local environmental management systems and the overarching, company-wide risk assessments, we monitor the legally compliant operation in the areas of waste management, airborne emissions, wastewater discharge, soil/groundwater contamination and the handling of environmentally hazardous substances. In the event of any relevant shortcomings, we document and eliminate them.

The effectiveness of the management systems is monitored by external auditors as part of the certification process (ISO 14001, EMAS, ISO 50001), as well as in the environmental sector by internal environmental risk assessments (environmental due diligence process).

## Environmental risk assessment



As early as 1999, we developed an environmental due diligence method in order to ensure transparency regarding potential environmental risks at our production locations, assess these risks and take the necessary preventive measures. Since then we have employed this method throughout the company — both internally at all production locations in which the company has a majority interest, as well as externally in connection with our planned mergers and acquisitions. We also have a standardised process in place for inspecting and assessing the Group's consolidated production sites every five years. The results of this process are reported to the respective plant and company management so that any necessary optimisations can be carried out. In addition, we annually assess the extent to which our recommendations for minimising risks at the locations have been put into practice. The objective of our environmental risk assessments is to ensure that we meet high environmental standards at all of our production locations around the world.

Between 2000 and 2019 we concluded four cycles of risk assessments at the production locations of Mercedes-Benz Cars & Vans. The fifth round of the environmental risk assessments commenced in 2019 and will run until 2023.

Travel restrictions and lockdown regulations due to the covid-19 pandemic prevented the location inspections from taking place as planned in 2020 and 2021. The inspections that had to be cancelled will now be carried out over the next few years so that Mercedes-Benz AG

can retain the five-year rhythm. We are continuing the internal reporting process, as well as our controlling of the improvement measures, as usual.

## Measures

### Training sessions on environmental protection

The Mercedes-Benz Group conducts environmental protection courses at its locations. The important content of our training courses includes waste and hazardous materials management, water pollution control, wastewater treatment, emergency management in case of environmentally relevant malfunctions and the planning of plants and workplaces in accordance with environmental protection principles.

The frequency and the content of our training sessions for employees depend on legal requirements as well as on local conditions. These requirements can differ depending on the location. In Germany, the corporate function "Sustainability, Group Environmental Protection & Energy Management" offers annual training courses for qualifying the officers responsible for air and water pollution control and waste management as required by German law.

### Reduction of energy consumption

**GRI 302-4/-5**

The Mercedes-Benz Group regularly measures and assesses essential energy consumption in order to identify and take advantage of savings potential in the

areas of production and infrastructure. Energy consumption is systematically recorded in a Group-wide database.

In order to save energy, we have, for example, optimised the switching times of lighting and ventilation systems at our locations and replaced conventional light sources with LEDs. In addition, we have implemented new lighting control concepts, including dimming functions. We've also optimised the controls of building technology systems and introduced a demand-oriented [airflow management system](#).

Furthermore, the Mercedes-Benz Group always looks for high levels of energy efficiency when it is purchasing new production facilities or converting buildings. We focus on the control systems for all technical installations and components, as well as a transparent system for measuring consumption. For example, we consider it important to have production equipment that can be switched off during breaks and non-production times and can be operated efficiently even under [partial-load](#) conditions. Moreover, we are sensitising the workforces at the plants to the issue of energy conservation by means of various measures such as generally visible tips, training courses and energy measurements in the production facilities. We're also conserving energy by means of many different technical measures, including an intelligent robot control system, highly efficient [turbo compressors](#) for centralised compressed air production and the systematic reduction of the [base load](#) of management and production units. Furthermore, we are striving toward an efficient control system for all of our energy supply and building technology facilities.

During the reporting year, Mercedes-Benz AG used highly efficient robots to assemble the new S-Class and the EQS. This enabled energy consumption to be significantly reduced compared to the predecessors.

In addition, Mercedes-Benz increased the energy efficiency of its plant in Tuscaloosa, Alabama (United States) in 2021 by, among other things, optimising existing ventilation systems, switching to LED lighting and using a highly efficient cooling unit for the new battery factory, which will commence operation in 2022.

At all Vans locations, we are optimising and expanding the technical systems for the recovery of waste heat from our processes. During the reporting year, a new heat recovery system was, for example, installed in the paint booths of the plant in North Charleston, South Carolina (United States). This allows heat energy to be recovered and fed back into the painting process.

The Mercedes-Benz Van plant in Düsseldorf optimised ventilation systems during the reporting year. Highly efficient drive systems, improved airflows and needs-based volumes of air significantly reduce energy consumption.

## The Mercedes-Benz Group in China



Beijing Benz Automotive Co. Ltd. (BBAC)	Fujian Benz Automotive Co. Ltd. (FBAC)	Shenzhen DENZA New Energy Automotive Co., Ltd.
<b>Ownership</b> 49 per cent Daimler, 51 per cent BAIC	<b>Ownership</b> 50 per cent Mercedes-Benz Vans Hongkong Limited, 35 per cent BAIC Motor Corporation Ltd., 15 per cent Fujian Motor Industry Group Corporation	<b>Ownership</b> 50 per cent Daimler, 50 per cent BYD Co., Ltd.
<b>Location</b> Beijing	<b>Location</b> Fuzhou	<b>Location</b> Shenzhen
<b>Production volume in 2021</b> 578,254 units	<b>Production volume in 2021</b> 37,766 units	<b>Production volume in 2021</b> 4,858 units
<b>Production</b> EQC <sup>1</sup> SUV, AMG A35L, A-Class L, C-Class SWB & LWB, E-Class L, GLC SUV L, GLB, GLA, EQA, EQB	<b>Production</b> Body shop and Paint shop and assembly plant for vans (V-Class, Vito)	<b>Production</b> DENZA X PHEV DENZA X BEV
<b>Energy consumption</b> 1,059.3 GWh – thereof electricity: 505.7 GWh – thereof renewable electricity: 33 GWh – thereof natural gas: 520.6 GWh	<b>Energy consumption</b> 119.4 GWh – thereof electricity: 55.8 GWh – thereof natural gas: 63.5 GWh	

1 EQC 400 4MATIC: NEDC: Combined electrical consumption: 21.9–19.4 kWh/100 km; CO<sub>2</sub> emissions combined: 0 g/km. Electricity consumption was determined on the basis of Commission Regulation (EC) No 692/2008.

## Efficient water utilisation

GRI 303-1/-2/-3/-4/-5

Water is not only a precious commodity — it is also scarce. According to UNESCO's World Water Development Report, climate change, population growth and increasing consumption will lead to water scarcity for more than five billion people in 2050 — if we continue to use water at the present rate. That's why the Mercedes-Benz Group wants to help create a more sustainable water management system and continue reducing its water consumption.

We are achieving this reduction by closing our water cycles — for example, by treating process water and using closed-loop cooling systems instead of open ones. For instance, the new paint shops are now using  **dry** instead of  **wet separation technologies**. Mercedes-Benz has also implemented water-conserving measures for the rain test, which is used to check the water resistance of all new vehicles. At some locations, we are using a biological water treatment system that does not employ biocides. As a result, the wastewater contains fewer pollutants, and the volume of water can

be retained and reused within the cycle roughly three times as often.

Wastewater from the production processes and sanitary facilities is either channelled to local wastewater treatment and disposal facilities according to local regulations or pretreated and purified at the company's own sites. The Mercedes-Benz Group also has biological wastewater plants at a number of its locations. The risk of polluting rainwater on our plant premises is reduced through the Group's regulations for environmental protection.

In order to improve water quality and minimise the risk of water pollution, our efforts related to waste water discharge encompass measures such as regular wastewater checks and their documentation. In order to initiate targeted measures at the locations, we developed the standard "Storm Water Protection — Pollutant Discharge Elimination" in 2014. This standard provides fundamental information and guidelines for the prevention and reduction of potential environmental damage through the rainwater management systems at production facilities, company-owned

sales and service outlets and workshops. Since then, it has provided a basis for the targeted improvement of water quality.

### **Assessing water-related risks**

At the Mercedes-Benz locations, we also evaluate water-related risks as part of our environmental risk assessments that take place every five years. The focus is on water extraction, discharge, flooding, scarcity and contamination. If necessary, remedial measures are initiated and their implementation is monitored. This ensures that technical and organisational risks are reduced in a demonstrable manner. Based on the assessments made over the past five years, only a few locations that suffered from water stress were identified.

Since 2021, Mercedes-Benz AG has also been working with the World Wide Fund for Nature (WWF). We use the WWF water risk filter to examine and identify locations where there might be negative effects in the future. All of the Mercedes-Benz AG production locations were examined during the reporting year. Several of them will continue to be monitored.

### **Less waste**

**GRI 306-1/-2**

The goal of the Mercedes-Benz Group is to keep the waste volumes generated in its production operations as low as possible. In order to make these efforts more focussed and long-lasting, we want to make the reduction of the total volume of waste a mandatory goal in the future.

In order to achieve this goal, it is important to ensure transparency concerning the waste value streams and to correctly separate the various types of waste. In Europe we classify different types of waste according to waste key numbers, and we treat and dispose of them according to legal requirements. We work with licensed and regularly certified waste disposal companies to ensure the professional disposal of our waste materials. Furthermore, we continue to implement new or optimised production processes in order to reduce waste such as clippings, sands, filter media and slurries.

Among other things, the sub-plant in Hedelfingen has installed filters into the swarf conveyor system. This enables more processing oil to be reused and reduces

the amount of waste by 360 tons per year. We have also optimised the treatment and process reuse of old sands at the Untertürkheim plant. This continuous reuse of the sand cuts waste by more than 800 tons each year. During the reporting year, we also expanded the pre-treatment system for wastewater at the plant in Yesipovo (Russia), thus reducing the waste from water-soluble paints and coatings by over 1,500 tons.

However, our measures are not only restricted to individual locations, as we also search for cross-plant solutions for reusing operating materials. Among other things, we reuse the end caps of powertrains. These caps have a specific weight of 44 grams and their reuse in axle manufacturing can reduce waste by more than 20 tons per year.

### **Avoiding waste and CO<sub>2</sub> emissions in catering**

The production and sale of food and the disposal of food waste all have a considerable impact on the environment. The Group's catering company in Germany, Daimler Gastronomie GmbH, provides around 45,000 employees with food and beverages daily at 11 locations in 30 staff restaurants and 70 company-owned shops. Our goal is to reduce the CO<sub>2</sub> balance of our food and the volume of waste it generates.

Since March 2021 we have only offered take-away meals and drinks in disposable non-plastic packaging made of renewable raw materials. This switch enables us to cut plastic use by about 57.9 tons per year. However, we focus on reusable alternatives. As a result, we introduced a reusable non-plastic cup in January 2021. A deposit is charged for these cups. Since April 2021 we have also been offering a free reusable container for take-away food.

We want to reduce the CO<sub>2</sub> emissions caused by our bought-in and prepared meals by up to 15 per cent in 2022. We want to achieve this goal by increasingly procuring regional and seasonal goods for our meals. Moreover, we want to optimise the use of meat and dairy products. For example, we now offer a vegan dish every day and will calculate the greenhouse gas emissions of individual meals in the future. Since December 2021, Daimler Gastronomie has been displaying its CO<sub>2</sub> emissions at several locations. By March 2022, this kind of labelling is to be introduced at all of its directly

operated canteens. This will enable us to depict savings in CO<sub>2</sub> emissions and increase our employees' awareness of what they eat while encouraging them to do so in an environmentally friendly way.

Wasting less food is another means of cutting CO<sub>2</sub> emissions. That's why we constantly weigh our waste food and make sure to avoid causing such waste along the entire value chain. Moreover, we set concrete goals for every year. During the reporting year, we achieved our goal of reducing the amount of waste food by five per cent relative to the previous year. We want to achieve this goal again in 2022.

### **Biological diversity**

The decline of biodiversity is a global problem that is steadily growing. There are many causes for this decline, including the massive use of natural resources, increasing pollutant emissions and production-related inroads on habitat. Along with measures to reduce immissions and protect the climate as well as soil and water resources, another important task for Mercedes-Benz Group AG is the maintenance and promotion of biodiversity at its locations. At our production plants we have already established many measures to preserve the environmental balance, and we will continue to expand them in the future.

Our internal recommendations for promoting biodiversity include practical tips for creating semi-natural habitats at our plants. They encourage the plants to actively promote biodiversity and to consider this aspect when construction work is being planned, as well as implementing the corresponding measures. For example, at our locations we have created insect hotels and nesting aids for local birds, set up hotels for wild bees and created greening for roofs and façades, dry stream beds, rock gardens and flowering meadows. We have also redesigned semi-natural green areas at many of our locations in Germany. The German environmental organisation NABU has provided advice, support and documentation for our programmes benefiting the flora and fauna at these locations.

Many of the plants in Germany use the biodiversity index (BIX) we have developed in-house to evaluate their sites. The index indicates the environmental value of a plant-covered area or of an entire location. The BIX can

be used to determine whether appropriate measures are required to promote biological diversity.

In order to make the employees aware of the importance of biodiversity, we have designed a travelling exhibition on this topic and presented it at many German locations in the reporting year.

In 2022, the Group's sales outlets will install hive aids for wild bees throughout Germany in order to contribute to biodiversity at the local level.

### **Involvement in raw material initiatives**

Raw material initiatives serve as important platforms for making the procurement of raw materials more environmentally and climate-friendly and more responsible. They provide cross-sector mechanisms such as auditing standards and certification systems that help, among other things, to make it possible to trace the origins of materials. The Mercedes-Benz Group focusses here on aluminium and steel:

- **Aluminium Stewardship Initiative:** The Mercedes-Benz Group joined the Aluminium Stewardship Initiative (ASI) in 2018. Through our membership, we are promoting the introduction and spread of an independent certification system for the entire aluminium value chain. The Responsible Aluminium Performance Standard combines ethical, environmental and social aspects. In the area of resource conservation, it particularly focusses on greenhouse gas emissions, airborne emissions, wastewater, waste and water. As a member of the Standards Committee, we are currently reworking and enhancing this standard. Mercedes-Benz AG already procures ASI-certified materials for certain components, such as those in the EQS. In addition, we only award contracts to our tier-1 press shop and foundry suppliers in Europe if they procure their primary aluminium from ASI-certified sources.
- **Responsible Steel Initiative:** The Mercedes-Benz Group has been a member of the Responsible Steel Initiative since 2018, because steel accounts for the largest proportion of material used in automobile construction. It is also the world's largest raw materials industry. The Responsible Steel Initiative is developing a uniform certification system that, on the one

hand, specifies requirements regarding the responsible use of resources and, on the other, addresses the greenhouse gas emissions caused by the steel industry. The requirements of the certification system have been defined cooperatively by a number of stakeholders including the Mercedes-Benz Group. Our contribution particularly features the end customer's perspective.

## 🌐 Initiatives for sustainable raw material supply chains

# Effectiveness and results

## The effectiveness of our management approach

**GRI 103-3**

The Mercedes-Benz Group wants to steadily reduce resource consumption in production. To this end, we have set ourselves targets for water and energy consumption as well as for the volume of disposable waste per vehicle. We plan to achieve these targets by 2030. In order to monitor progress toward its goals and its reporting in this area, we systematically compile key environmental and energy data from the plants in Germany and abroad. The production locations throughout the world enter this data into a central environmental data information system for subsequent evaluation.

On the basis of this data and with the help of internal and external tools, we assess the extent to which we are reaching the resource targets we have set for our plants. For in-house assessments, we have defined key figures, which we regularly monitor. We have commissioned an auditing company to conduct the external audit. This company annually evaluates a selected number of our corporate goals and their implementation. We use the audited results of these evaluations to adapt and improve our measures for resource conservation.

## Results

**GRI 302-3/-4/-5**

The projects for resource conservation were implemented as planned. Despite increasing energy efficiency, during the reporting year the energy consumption per vehicle at Mercedes-Benz Cars rose by ten per cent compared to 2020. The efficiency measures implemented were overlaid by increased consumption by our ventilation and heating systems due to the pandemic

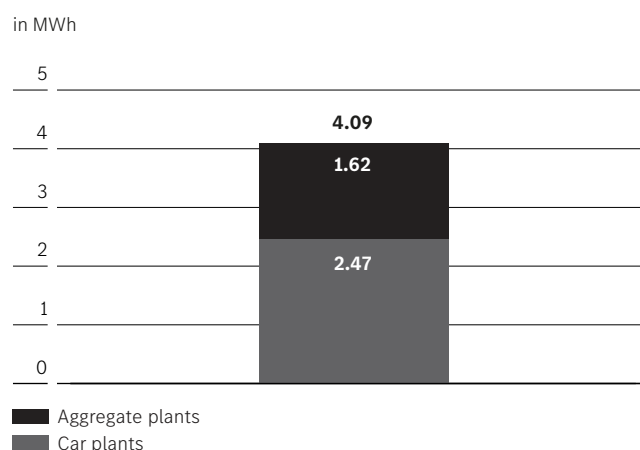
and by multiple ramp-ups of new models. An additional factor was due to the maintenance of production readiness at our plants during the semiconductor supply bottlenecks.

Approximately ten per cent of the energy consumption per vehicle produced is due to generation losses in the production of power and heat in our highly efficient combined heat and power plants.

The powertrain plants at our production locations manufacture products and parts kits for vehicles the production output of which is not consolidated in the scope of our balance. Around 30 per cent of our energy consumption of the powertrain plants is accounted for by these production volumes.

Due to similar effects, the energy consumption per vehicle at Mercedes-Benz Vans increased by five per cent compared to the previous year.

## Energy consumption per vehicle by car and powertrain plants



Mercedes-Benz Cars & Vans consumed 6,786 GWh/a of electricity, natural gas, fuels and other energy carriers in 2021. This was an increase of three per cent on the prior year.

At Mercedes-Benz Cars, water consumption per vehicle rose by five per cent in the reporting year, compared to 2020. This was also due to the maintenance of production readiness at our plants during the semiconductor supply bottlenecks and multiple ramp-ups of new

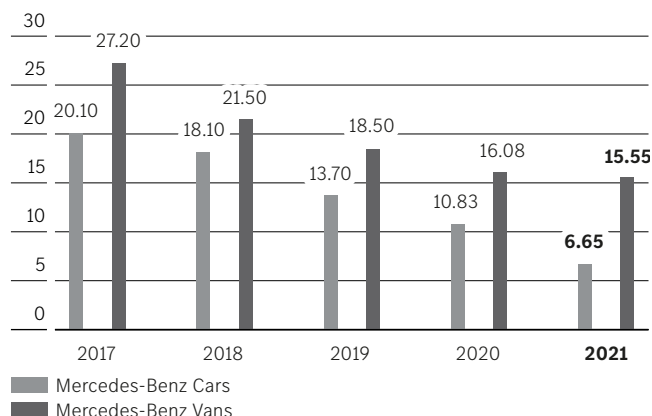


models. Mercedes-Benz Vans was able, in contrast, to reduce the water consumption per vehicle by around two per cent compared to the previous year.

The volume of disposable waste per vehicle at Mercedes-Benz Cars decreased during the reporting year by 39 per cent compared to 2020. In recent years, waste has continuously decreased at Mercedes-Benz Cars due to the reduction of the waste components that made up a large part of the amounts disposed of at the plants for major assemblies and CKD production. Mercedes-Benz Vans reduced the volume of disposable waste per vehicle by three per cent compared to the previous year.

## Development of waste for disposal Mercedes-Benz Cars & Vans

in kg/vehicle



## Energy consumption (in GWh)

GRI 302-1

	2017	2018	2019	2020	2021 <sup>1, 2</sup>
<b>Total</b>	<b>11,340</b>	<b>11,607</b>	<b>11,287</b>	<b>9,711</b>	<b>6,786</b>

1 These data include Mercedes-Benz Cars & Vans. The spin-off and hive-down of the Daimler commercial vehicle business as an independent company makes it impossible to compare these data with the data from the previous years.

2 These data have been adjusted due to the spin-off and hive-down of the Daimler commercial vehicle business as an independent company, nonetheless, they still contain minor uncertainties as adjustments for combined locations and units can first be made in financial year 2022.

## Water withdrawal (in 1,000 m<sup>3</sup>)

GRI 303-3

	2017	2018	2019	2020	2021 <sup>1, 2</sup>
<b>Total</b>	<b>14,014</b>	<b>14,381</b>	<b>13,486</b>	<b>11,778</b>	<b>7,454</b>

1 These data include Mercedes-Benz Cars & Vans. The spin-off and hive-down of the Daimler commercial vehicle business as an independent company makes it impossible to compare these data with the data from the previous years.

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## Waste by category (in 1,000 t)

GRI 306-3/-4/-5

	2017	2018	2019	2020	2021 <sup>1, 2</sup>
Non-hazardous waste for disposal	82	40	28	13	7
Non-hazardous waste for recycling	239	318	303	251	151
Scrap metal for recycling	858	877	830	685	433
Hazardous waste for disposal	15	10	10	11	8
Hazardous waste for recycling	75	82	79	65	51
<b>Total</b>	<b>1,269</b>	<b>1,328</b>	<b>1,249</b>	<b>1,025</b>	<b>651</b>

1 These data include Mercedes-Benz Cars & Vans. The spin-off and hive-down of the Daimler commercial vehicle business as an independent company makes it impossible to compare these data with the data from the previous years.

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