MERCEDES-EQ

Press Information
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The EQS SUV: Redefined SUV luxury

Contents

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Descriptions and data in this press kit apply to the Mercedes-EQ European model range. Details may vary from country to country.

The essential information

The new EQS SUV[1]: the main points at a glance

With the luxury saloon EQS and the sporty executive saloon EQE, Mercedes-Benz has entered a new, all-electric era in the upper market segments as well. The EQS SUV, the third model series with this architecture developed for electric vehicles, will soon follow. The SUV offers plenty of space, comfort and connectivity for up to seven passengers in its avant-garde, luxurious interior. Thanks to powerful electric motors, responsive 4MATIC all-wheel drive and an intelligent OFFROAD driving mode, the EQS SUV is also capable of tackling light terrain with ease.

The new EQS SUV shares the long wheelbase (3210 millimetres) with the EQS Saloon, but is over 20 centimetres higher. The dimensions in detail: 5125/1959/1718 millimetres (length/width[2]/height[3]). The **interior dimensions** benefit from these generous SUV dimensions and from the advantages of the purpose design tailored to the electric platform. The second row of seats can be electrically adjusted as standard. Up to four golf bags fit in the boot. A third row of seats with two additional individual seats and extensive comfort features for all passengers is available as an option.

The EQS Saloon is the current aerodynamics world champion for production cars[4]. Its purpose design with smooth underbody and usually closed radiator shutter was a good starting point for **aerodynamic measures** on the EQS SUV. The optimisation of SUV-typical flow details led to a hitherto unique combination of spaciousness and aerodynamic efficiency.

All EQS SUVs have an **electric drive train (eATS)** on the rear axle, and the versions with 4MATIC also have an eATS on the front axle. In the 4MATIC models, the Torque Shift function ensures intelligent, continuously variable distribution of drive torque between the rear and front electric motors and thus the use of the most efficient eATS in each case. The electric motors on the front and rear axles are permanently excited synchronous motors (PSM). The advantages of this design include high power density, high efficiency and high power constancy.

The EQS Saloon was the first model series from Mercedes-Benz in which completely new vehicle functions can be activated in several areas via **over-the-air updates (OTA)**. With the EQS SUV, this offer is significantly expanded. For example, Trailer Manoeuvring Assist or MBUX (Mercedes-Benz User Experience) Augmented Reality Navigation can be activated at a later date.

With the EQS SUV, Mercedes-Benz is taking a major step towards **zero-emission mobility** and is moving a step closer to fulfilling Ambition 2039. The model is produced in a completely CO_2-neutral way. The EQS SUV puts real solutions for emission-free mobility, intelligent resource conservation and responsible circular economy on the road.

The **chassis** of the new EQS SUV has a four-link axle at the front and an independent multi-link suspension at the rear. The AIRMATIC air suspension with continuously adjustable damping ADS+ is standard equipment. The vehicle level can be raised by several centimetres. In addition to the DYNAMIC SELECT modes ECO, COMFORT, SPORT and INDIVIDUAL, the 4MATIC versions feature OFFROAD, a further mode for off-road

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[1] Data on power consumption and range are provisional and have been voluntarily determined internally in accordance with the "WLTP test procedure" certification method. There are no confirmed figures from an officially recognised testing organisation to date. Deviations from the final data are possible.
[2] Without exterior mirrors
[3] Data for five-seater
[4] The EQS 450+ (WLTP: combined power consumption: 19.8-15.7 kWh/100 km; CO_2 emissions: 0 g/km) achieves a best-ever C_d value of 0.20 with 19" AMG wheel/tyre combination and AMG Line exterior in the SPORT driving mode. The WLTP power consumption has been determined on the basis of Regulation (EU) No. 2017/1151.

driving. Furthermore, rear-axle steering with a steering angle of up to 4.5 degrees is standard. It provides plenty of manoeuvrability in the city and agility over land. Optionally and also via an OTA update, a version with up to 10 degrees steering angle is available.

The principles of **Integral Safety**, in particular accident safety, apply regardless of the platform. Like all other Mercedes-Benz models, the EQS SUV therefore has a rigid passenger cell, special deformation zones and modern restraint systems. The European version of the EQS SUV is the first Mercedes-Benz model to be able to detect whether rear seats are actually occupied. If a passenger in the rear is not wearing a seat belt, the driver receives a specific warning. Another new feature at Mercedes-Benz is what is known as the occupant presence reminder. This system can indicate children who may have been overlooked in the rear of the vehicle. In vehicles for Europe, Australia and New Zealand, the reminder is on board as standard.

Mercedes me Charge[1] is one of the largest charging networks worldwide: it currently comprises over 700,000 AC and DC charging points, including around 300,000 are in Europe. Since 2021, Mercedes-Benz has ensured a subsequent offset with green electricity when customers use Mercedes me Charge to charge their cars in Europe. High-quality guarantees of origin ensure that as much green power from renewable energies is fed into the grid as is withdrawn via Mercedes me Charge. The new Mercedes me Charge function Plug & Charge makes charging the EQS SUV at public charging stations that support Plug & Charge convenient.

Navigation with Electric Intelligence plans the fastest and most convenient route, including charging stops, based on numerous factors and reacts dynamically to traffic jams or a change in driving style, for example. This includes a visualisation in the MBUX infotainment system as to whether the state of charge of the battery is sufficient to return to the starting point without charging. Charging stations along the route that have been added manually are given preference in the route calculation. Proposed charging stations can be excluded. The estimated charging costs per charging stop are calculated.

With ENERGIZING AIR CONTROL Plus, Mercedes-Benz thinks holistically about **air quality** in the EQS SUV. The system is based on filtration, sensors, a display concept and air conditioning. The HEPA (High-Efficiency Particulate Air) filter has a very high filtration level to trap fine particles, microparticles, pollen and other substances entering with the outside air.

With intelligent software, **MBUX** fully adapts to its users and provides them with personalised suggestions for numerous infotainment, comfort and vehicle functions. With what is known as the zero layer, the most important applications are always offered on the topmost level within the field of vision, according to situation and context.

The highlight of the interior is the **MBUX Hyperscreen** (special equipment). This large, curved screen unit spans almost from A-pillar to A-pillar. Three screens sit under a common cover glass and merge visually. The 12.3-inch OLED display for the front passenger gives them their own display and control area. In Europe, and in a growing number of countries, the front seat passenger is also able to watch dynamic content while the vehicle is on the move. This is because Mercedes-EQ is able to rely on an intelligent, camera-based blocking logic: If the camera detects that the driver is looking at the passenger display, the system automatically dims the dynamic content.

The **Dolby Atmos sound system®** takes the audio experience in the EQS SUV to a new level. Individual instruments or voices of the studio mix can be placed all around the listening area. A new kind of sound

[1] In order to be able to use the Mercedes me connect service "Mercedes me Charge", a separate charging contract with a selected third-party provider is required for charging payment and billing purposes. A personal Mercedes me ID and agreement to the Terms of Use for the Mercedes me connect services are required for use of the Mercedes me connect services.

animation thus becomes possible: This is because while conventional stereo systems usually have a left-right dynamic, Dolby Atmos® can use the entire space and create a 360-degree experience.

Key technical data[1]

		EQS 450+	EQS 450 4MATIC	EQS 580 4MATIC
Drive system		Rear-wheel drive	All-wheel drive	All-wheel drive
Electric motor(s):	Type	Permanently excited synchronous motor(s) (PSM)		
Output	kW	265	265	400
Torque	Nm	568	800	858
Rated voltage	Volts	396	396	396
On-board charger (standard/option)	kW	11/22 (USA: 9,6)		
AC charging time, three-phase (11/22 kW)	h	5/10 (USA: 11,5)		
DC charging capacity, max.	kW	200		
DC charging time at fast charging station[2]	min	31		
DC charging: max. range after 15 minutes[3] (WLTP)	km	250	n/a	n/a
Vehicle				
Length/width/height	mm	5125/1959/1718		
Length/width/height (USA)	mm	5125/1959/1718		
Wheelbase	mm	3210		
Turning circle (with rear-axle steering 4.5°/10°)	m	11.9/11.0		
Luggage capacity VDA (five/seven-seater)	l	645-2.100/565-2.020		
Electrical consumption and range				
Electrical consumption (WLTP)	kWh/100 km	23,0 – 18,6	24,0 – 20,0	24,0 – 20,0
CO_2 emissions (WLTP)	g/km	0	0	0
Range (WLTP)	km	536 - 660	507 - 613	507 - 613

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Press releases and digital services for journalists and multipliers are available on our online platform **Mercedes me media** at media.mercedes-benz.com and on our **Mercedes-Benz Media Site** at group-media.mercedes-benz.com. You can also learn about current Mercedes-Benz Cars & Vans topics and events on our **Twitter channel @MB_Press** at www.twitter.com/MB_Press.

Mercedes-Benz AG at a glance
Mercedes-Benz AG is responsible for the global business of Mercedes-Benz Cars and Mercedes-Benz Vans with approximately 172,000 employees worldwide. Ola Källenius is Chairman of the Board of Management of Mercedes-Benz AG. The company focuses on the development, production and sales of passenger cars, vans and vehicle-related services. Furthermore, the company aspires to be the leader in the fields of electric mobility and vehicle software. The product portfolio includes the Mercedes-Benz brand with the Mercedes-AMG, Mercedes-Maybach, Mercedes-EQ, G-Class brands as well as products of the smart brand. The Mercedes me brand offers access to the digital services from Mercedes-Benz. Mercedes-Benz AG is one of the world's largest manufacturers of luxury passenger cars. In 2021, it sold around 1.9 million passenger cars and nearly 386,200 vans. In these two business areas, Mercedes-Benz AG is continually evolving its worldwide production network of around 35 production locations on four continents, while gearing itself to meet the requirements of electric mobility. At the same time, the company is constructing and extending its global battery production network on three continents. Sustainability is the guiding principle of the Mercedes-Benz strategy and for the company this means creating lasting value for all stakeholders: for customers, employees, investors, business partners and society as a whole. The basis for this is the sustainable corporate strategy of

[1] Data on power consumption and range are provisional and have been voluntarily determined internally in accordance with the "WLTP test procedure" certification method. There are no confirmed figures from an officially recognised testing organisation to date. Deviations from the final data are possible.
[2] The charging times are for a 10-80% charge at a DC fast charging station of category "K" or "L" pursuant to EN17186 with 500 A charging current
[3] At DC fast charging stations with 500 amps based on WLTP range

the Mercedes-Benz Group. The company thus takes responsibility for the economic, ecological and social effects of its business activities and looks at the entire value chain.

"SUV luxury, redefined"

The new EQS SUV in quotes from Mercedes-Benz management

"The EQS SUV is the third vehicle on our new all-electric platform. It has everything our customers love about the EQS - and combines this with the strengths and versatility of an SUV that can seat up to seven people. With the EQS SUV, we are continuing to consistently implement the strategy of making our vehicles more sustainable and digital - with the goal of building the most desirable electric cars in the world."
Ola Källenius, Chairman of the Board of Management of Mercedes-Benz Group AG

"In order to remain the leading luxury brand in an all-electric future, Mercedes-Benz is accelerating the market launch of its EQ models. This year, our portfolio will comprise nine all-electric Mercedes-EQ models worldwide, and we have more exciting products in the pipeline".
Markus Schäfer, Member of the Board of Management of Mercedes-Benz Group AG, Chief Technology Officer, responsible for Development and Procurement

"Be it family, adventurers, tech fans or music lovers: When the EQS SUV is launched in the second half of 2022, it will fulfil the wishes of many customers. The target groups are diverse, but they are united by the active lifestyle. Furthermore, the EQS SUV simply looks good. Therefore, we believe that the EQS SUV will drive luxury and technology for our customers in this important segment. And in doing so, it embodies the pioneering spirit of Mercedes-Benz."
Britta Seeger, Member of the Board of Management of Mercedes-Benz Group AG, responsible for Marketing and Sales

"The global Mercedes-Benz production network is digital, sustainable, efficient and flexible. The Tuscaloosa plant, with its highly skilled and motivated U.S. workforce, will be a critical factor in the continued success of Mercedes-Benz; and we are proud that our new electric SUVs will also be built in Alabama for global markets."
Jörg Burzer, Member of the Board of Management of Mercedes-Benz AG, Production and Supply Chain Management

"With our EQS SUV, we are presenting our first all-electric SUV on the new architecture. The futuristic design consists of an emotionally appealing integration of surfaces and shapes, and the seamless transitions reflect the style of our company. This creates an aerodynamic and modern look. Together with the innovative, progressive SUV proportions, we are completely redefining SUV luxury of the future".
Gorden Wagener, Chief Design Officer Mercedes-Benz AG

Interesting facts & figures

The new EQS SUV at a glance

Depending on the vehicle equipment and configuration, WLTP ranges of up to 660 kilometres[1] are possible.

The torque sent to the wheels by the respective eATS (electric drive train) is checked 10,000 times per minute and adjusted if necessary. This enables a much faster response in the versions with 4MATIC than with mechanical all-wheel drive.

As standard, the EQS SUV has rear-axle steering with a steering angle of up to 4.5 degrees, and as special equipment even up to 10 degrees. The turning circle is reduced from 11.9 to 11.0 metres with 10-degree rear-axle steering.

The electric motor on the rear axle has 2 windings with 3 phases each. The 6-phase design makes this permanently excited synchronous motor (PSM) particularly powerful. Its peak power is 265 kW.

DIGITAL LIGHT (special equipment) has a light module in each headlamp with three extremely bright LEDs whose light is refracted and directed with the help of 1.3 million micro-mirrors. The resolution is therefore more than 2.6 million pixels per vehicle.

Mercedes me Charge has one of the most tightly knit charging networks with over 700,000 charging points, including around 300,000 in Europe.

With the MBUX Hyperscreen (special equipment), multiple displays merge seamlessly to create an impressive curved screen band over 141 centimetres wide. The area perceived by the occupants measures 2432.11 sq. cm.

The large glass covering the MBUX Hyperscreen is curved in three dimensions in a moulding process at temperatures of approx. 650°C. This process allows a distortion-free view of the display unit across the entire width of the vehicle, irrespective of the radius of the glass cover.

A lithium-ion battery with up to 12 cell modules is installed in the EQS SUV. With this generation of batteries, a major step has been achieved in terms of the sustainability of the cell chemistry: the optimised active material consists of nickel, cobalt and manganese in a ratio of 8:1:1.

The optional driving sound of the EQS SUV is interactive and reacts to a good dozen different parameters such as the position of the accelerator pedal, speed or energy recovery.

No.6 MOOD mimosa is the name of the fragrance composed especially for the EQS SUV, based on the aroma of dark chocolate. It bears the number 6 because the first electric cars were added to the model range in 1906 in the form of the "Mercédès Electrique" vehicles. No.6 MOOD mimosa is an earthy fragrance with a touch of sensuality.

[1] 536-660 km are the provisional range figures of the EQS 450+ (WLTP: Combined power consumption: 23.0-18.6 kWh/100 km; combined CO_2 emissions: 0 g/km). Data on power consumption and range are provisional and were voluntarily determined internally in accordance with the "WLTP test procedure" certification method. There are no confirmed figures from an officially recognised testing organisation to date. Deviations from the final data are possible.

To get to the most important applications of MBUX, the user has to scroll through 0 menu layers. Hence the term zero layer.

Head-up displays are available in two sizes as an option. The Augmented Reality Head-up Display shows relevant information and actions three-dimensionally in the real driving situation and surroundings. Its display area has a diagonal of 77 inches. A virtual colour image seems to float in the field of vision at a distance of about 10 metres.

The HEPA (High-Efficiency Particulate Air) filter as part of the optional ENERGIZING AIR CONTROL Plus, with a volume of 9.82 cubic decimetres, cleans the incoming outside air at its very high filtration level. Up to 99.75 percent of particles are separated out. Around 600 grams of activated charcoal are used to neutralise odours. The adsorption area is equivalent to about 150 football pitches.

For haptic feedback during operation, a total of 12 actuators are located under the touch screen surfaces of the MBUX Hyperscreen. If a finger touches certain spots there, they trigger a tangible vibration in the cover plate.

1 Coating of the cover glass simplifies cleaning of the MBUX Hyperscreen. The curved glass itself consists of particularly scratch-resistant aluminium silicate.

8 CPU cores, 24 GB RAM and 46.4 GB per second RAM memory bandwidth are some of the MBUX technical data.

A DC fast charging system with a charging capacity of up to 200 kW is fitted on board for (fast) direct current charging. In 15 minutes, power corresponding to a range of up to 250 kilometres[2] can be recharged on the basis of the WLTP range.

The brightness of the MBUX Hyperscreen is adjusted to the ambient conditions using the measurement data from 1 multifunction camera plus 1 light sensor.

With up to 7 profiles, the display area for the front passenger on the MBUX Hyperscreen can be individualised.

"Hey Mercedes" supports 27 languages with Natural Language Understanding (NLU).

[2] Provisional figures for the EQS 450+ (WLTP): combined power consumption: 23.0-18.6 kWh/100 km; combined CO_2 emissions: 0 g/km). Data on power consumption and range are provisional and were voluntarily determined internally in accordance with the "WLTP test procedure" certification method. There are no confirmed figures from an officially recognised testing organisation to date. Deviations from the final data are possible.

Plenty of space and comfort on up to seven seats

The new EQS SUV: the interior dimensions and variability

The new EQS SUV shares the long wheelbase (3210 millimetres) with the EQS Saloon, but is over 20 centimetres higher. The interior dimensions benefit from these generous SUV dimensions and from the advantages of the purpose design tailored to the electric platform. A third row of seats with two additional individual seats and extensive comfort features for all passengers is available as an option.

The space offered by the EQS SUV (length/width[1]/height[2]: 5125/1959/1718 millimetres) is generous. Headroom in the first row of seats with sliding sunroof is 1035 millimetres, in the second it is 1030 and in the third 900 millimetres. Shoulder room and elbow room in the first and subsequent rows of seats are also above average.

The second row of seats can be electrically adjusted fore and aft by up to 130 millimetres as standard. As a result, the knee room in the second row of seats is between 830 and 960 millimetres - a comfortable level. The backrests of the second row of seats recline electrically: by 14 degrees to the front and 4 to the rear. The corresponding switches are located in the doors on the right and left.

Because the second row of seats is electrically adjustable as standard, the luggage compartment can be continuously expanded from 645 litres (for maximum legroom) to up to 880 litres. This means that even with five occupants, up to 24 crates of mineral water or four golf bags can be transported. With the second row of seats folded down, the luggage compartment offers a generous volume of up to 2100 litres. With an optional third row of seats, there is generous boot space available too: There are up to 800 litres behind the second row of seats and 2020 litres when they are folded down. If all seven seats are used, a volume of 195 litres remains behind the third row of seats.

The seat backrests can be divided and folded down in a 40:20:40 ratio. They can also be electrically adjusted in inclination. In the so-called cargo position, they angle up more steeply. Larger objects can then be transported without folding them down. The cargo position can be activated with switches in the interior. The height under the open tailgate is 1978 millimetres. Even tall people have sufficient headroom for loading.

As an option, the EQS SUV has a third row of seats with two additional individual seats. The seats in the EQS SUV fold up from the load floor mechanically. With the seats folded, the floor is level. In combination with the third row of seats, an EASY ENTRY function is standard in the second row of seats. For easier access all the way to the rear, the backrest thus moves forward beyond the usual adjustment range, by up to a total of 290 millimetres.

[1] Without exterior mirrors
[2] Data for five-seater

Here the equipment of all three rows of seats in detail:

	Variability	Comfort appointments:
Driver/front passenger seat	• Fully electric adjustment with memory function (standard)	• Ambient lighting on seat including contour lighting (standard) • 4-way lumbar support (standard) • Seat heating (standard) • Luxury head restraint (standard) • Climate-controlled seats (option) • Multicontour seats with massage functions (option)
Second row of seats (standard)	• Seat backrest with 40:20:40 folding split • Backrest angle infinitely electrically adjustable • Seat row electrically fore/aft adjustable by 130 mm, seat surface with 40:20:40 split	• Luxury head restraints (standard) • Rear Comfort package with premium rear armrests (optional) • Seat heating (option) • i-Size child seat attachment (market-dependent)
Third row of seats (option)	• Two retractable individual seats with folding head restraints • EASY-ENTRY function of the second row of seats	• Seat heating (option)

Dynamic proportion, innovative aesthetics and sensual purity

The new EQS SUV: the exterior design

The EQS SUV is the first all-electric premium SUV from Mercedes-EQ. The innovative and holistic design is based on a new vehicle architecture. It differs from vehicles with internal combustion engines at first glance: highest demands on function and aerodynamics are combined with innovative aesthetics in the unmistakable purpose design. Sensual Purity is reflected in generously modelled surfaces, reduced joints and seamless transitions (seamless design). Even as a seven-seater, the EQS SUV impresses with its dynamic proportions.

The front is combined into a 'Black Panel' unit. Headlamps connected by a light band and the deep black radiator grille (Black Panel) form the face. While three light dots form the striking daytime running light signet on the EQS Saloon, there are three small triangles on the EQS SUV. Another special feature is the structured surface of the light modules illuminated from behind: A three-dimensional hexagon pattern in combination with the daytime running lights ensures recognition. LED High Performance headlamps are standard, DIGITAL LIGHT with light band is available as special equipment.

The exclusive look of the Black Panel radiator grille with the central Mercedes star can be enhanced further still: In conjunction with AMG Line Exterior, it is also available as special equipment with a three-dimensional star pattern (Mercedes-Benz Pattern). This references the original star of the Daimler-Motoren-Gesellschaft company, which was registered as a trademark in 1911. In addition to its unique look, there is also a function behind the Black Panel surface: the various sensors of the driving assistance systems such as ultrasound, camera and radar are integrated. Seamless design is particularly evident in the front design with the reduced joint pattern and an overlapping bonnet. The front bonnet underlines the dynamics of the EQS SUV with power bulges.

Striking lines

The dynamic silhouette defines the side view of the EQS SUV and demonstrates its aerodynamic efficiency from afar. It begins with the round front end, flows dynamically over the steeply raked A-pillar and the roof contour to the rear spoiler. This is always black, which reduces the visual height of the vehicle in profile. The C-pillar is moved far back to communicate the spacious interior. The side window surface is generously framed by a three-dimensional chrome strip. The large wheels in dimensions from 20 to 22 inches, together with a muscular shoulder section, give the EQS SUV a sporty, robust character. Exclusively reserved for this model are two 22-inch rim versions with high-sheen finish and multi-coat black/high-gloss paint: For one, light-alloy wheels in a 5-twin-spoke design and, AMG light-alloy wheels in a multi-spoke design for another. Most wheels are extremely optimised in terms of aerodynamics and contribute to the overall efficiency of the car.

The exterior mirrors sit on the shoulder for aerodynamic and aeroacoustic reasons. The SUV-typical wheel arch claddings are black, as are the side sill panels, which reduces the visual volume of the vehicle. A running board is optionally available, which also offers aerodynamic advantages and thus has a positive effect on the electric range. On EQS SUVs without this special equipment, a three-dimensional chrome trim structures the lower area.

Flush door handles are standard. A panoramic sunroof is available as an option. It consists of two modules that together form a very large glass surface and thus ensure a lot of transparency and light in the interior.

The service flap for washer fluid has been integrated into the side of the left wing. The front bonnet is only opened by the workshop for maintenance work, such as replacing the cabin air filter.

Light band with LED lamps in 3D helix design

The highlight at the rear is the elaborately designed interior of the LED lights. The elements of the tail light have the shape of a curved 3D helix. In combination with the light band, this results in an unmistakable light signature for Mercedes-EQ.

The tailgate merges smoothly into the bumper. The colour of black wheel arch linings continues in the lower area of the rear bumper. Below it is a high-quality chrome element in diffuser look and with an aerodynamically optimised spoiler lip on the underbody.

Long-range driving fun

The new EQS SUV: electric drive

With a range of up to 660 kilometres (according to WLTP)[1] and an output of up to 400 kW, the EQS SUV also meets the requirements of a luxury SUV in terms of power delivery. All EQS SUVs have an electric drive train (eATS) on the rear axle, and the versions with 4MATIC also have an eATS on the front axle. In the 4MATIC models, the Torque Shift function ensures intelligent, continuously variable distribution of drive torque between the rear and front electric motors.

The modular drive concept allows a wide range of maximum total outputs from 265 to 400 kW. Depending on the vehicle equipment and configuration, WLTP ranges of up to 660 kilometres[1] are possible.

The electric motors on the front and rear axles are permanently excited synchronous motors (PSM). On a PSM, the rotor of the AC motor is fitted with permanent magnets and therefore does not need to be supplied with power. The magnets – and thus the rotor – follow the rotating alternating current field in the stator windings. In the EQS SUV, Mercedes-Benz uses a so-called pull-in winding for a particularly strong magnetic field. The motor is referred to as synchronous because the rotor turns at the same rate as the magnetic field of the stator. The frequency is adjusted in the power electronics inverters to the speed requirements of the driver. The advantages of this design include high power density, high efficiency and high power constancy. The motor on the rear axle is particularly powerful due to its six-phase design: it has two windings with three phases each.

Cooling: sophisticated thermal concept for high load capacity

Consistently high performance and multiple accelerations without a drop in power characterise the drive philosophy of the EQS SUV. This includes a sophisticated thermal concept with some special features. A so-called rotor cooling system in the shaft of the rotor cools it from the inside. Other cooling elements in the cooling circuit are fins on the stator, a needle-shaped pin-fin structure on the inverter and a transmission oil heat exchanger. This additionally brings more efficiency during cold driving, as it contributes to the heating of the transmission oil at the start of the drive and thus reduces friction in the transmission.

Intelligent energy recovery: one-pedal driving to a standstill

The EQS SUV offers several variants of energy recovery by means of regeneration. The driver can manually select the deceleration in three levels D$^+$ (sailing), D (standard regeneration), D- (enhanced regeneration) via paddle shifters behind the steering wheel.

On top of this there is D^{Auto}: In regeneration level D^{Auto}, the ECO Assistant offers situation-adapted regeneration - it operates in gliding mode or decelerates in such a way that the bottom line is the most efficient and comfortable driving style possible. The driver is shown in the instrument cluster and, if applicable, on the head-up display when it is advisable to take the foot off the accelerator pedal due to an upcoming event. If the indication is followed, the vehicle is decelerated with the greatest possible energy recovery rate until it comes to a standstill if there is another vehicle ahead, for example. The driver does not need to operate the brake pedal for this - literally one-pedal driving. Up to 5 m/s² deceleration can be achieved, 3 m/s² of which by means of energy recovery.

[1] 536-660 km are the provisional range figures of the EQS 450+ (WLTP: combined power consumption: 23.0-18.6 kWh/100 km; combined CO_2 emissions: 0 g/km). Data on power consumption and range are provisional and were voluntarily determined internally in accordance with the "WLTP test procedure" certification method. There are no confirmed figures from an officially recognised testing organisation to date. Deviations from the final data are possible.

4MATIC models: continuously variable distribution of the drive torques

The Torque Shift function ensures a continuously variable torque distribution between the two electric motors of the 4MATIC variants as needed and with optimised efficiency. Depending on the requirements, the torque distribution is regulated:

- Energy efficiency: When driving at a constant speed, an optimisation process determines the most efficient all-wheel-drive distribution in each case. The calculation takes into account that a permanent magnet synchronous machine can be switched off completely under certain conditions, which reduces the base load.

- Energy recovery power: Deceleration with the greatest possible energy recovery rate without overtaxing the grip of the wheels and thus endangering driving stability requires an adapted torque distribution. The energy recovery power of the versions with all-wheel drive is up to 290 kW[2]. A high energy recovery rate increases the range.

- Traction/acceleration: Here, the operating strategy distributes the drive torques just as ideally between the two axles. When cornering sportily, the operating strategy enables stable and neutral handling.

- Snow and ice: For maximum traction and driving stability also on snow and ice, the operating strategy detects spinning wheels and adjusts the torque distribution accordingly. Since both motors are controlled independently of each other, torque can still be provided to the other axle even if traction is lost on one axle.

- Off-road: In the OFFROAD driving mode, the all-wheel-drive distribution is optimised for unpaved roads, inclines and terrain.

Extensive testing: special test benches at Mercedes-Benz

On its way to series production, the EQS SUV covered many test kilometres, including at the Test and Technology Centre (PTZ) in Immendingen. The systematic validation of the overall vehicle serves to guarantee the high quality standards and is one of the extensive measures in the development process of every Mercedes-Benz model series. Stops included tough winter tests in Scandinavia, chassis and powertrain tests on proving grounds, public roads and on the high-speed test track in Nardò, as well as integrated overall vehicle heat testing in Southern Europe and South Africa. The EQS SUV was also on test drives in China, Japan, Dubai and the USA.

In the process, it completed the same demanding testing program as any other vehicle that can proudly wear a star. In addition, a number of tests were carried out specifically for electric cars, covering important development priorities such as range, charging and efficiency. Of course, special attention was paid to the e-drive and the battery.

In addition, there were several million test kilometres on a total of more than two dozen test benches in Stuttgart-Untertürkheim and at the development site in Nabern. Testing takes place on pure eATS test benches, where the current comes from a special DC source, a so-called battery simulation, and on eDrive system test benches: Here, the testing also includes the battery and the complete charging components of the vehicle. The route profile/test bench profile was modified compared to the combustion engines, for example, to take into account the torque load on the transmissions in both directions - a special load case determined by the high energy recovery power. In addition, there is the special hot/cold testing of the power electronics.

[2] This value refers to the electrical power fed into the electric battery due to recuperation. Deviations are possible

Powerful, highly efficient and intelligent

The new EQS SUV: the battery:

The EQS SUV has a lithium-ion battery with up to 12 cell modules and pouch or hardcase cells. Thanks to the 107.8 kWh capacity, sufficient energy can be provided for ranges of up to 660 kilometres according to WLTP[3]. The innovative battery management software, which was developed in-house, allows updates over the air (OTA). This keeps the energy management of the EQS SUV up-to-date.

Battery development is a decisive factor in Mercedes-Benz's electrification strategy. After all, the battery is the heart of an electric car and makes a decisive contribution to, among other things, the range and thus the driving characteristics of the electric vehicle. The EQS Saloon marks the launch of a new generation of batteries with significantly higher energy density. The new batteries set standards in terms of performance, efficiency and charging capacity.

They also meet the high Mercedes requirements in terms of safety, durability and sustainability. Mercedes-Benz issues a battery certificate for its high-voltage batteries, and thus a performance guarantee to customers: A term of 10 years or 250,000 kilometres with a remaining capacity of 70 percent.

Comprehensive battery expertise

The team of experts at the Mercedes-Benz Battery Centre of Competence has developed the high-efficiency batteries entirely in-house. The software for the intelligent management system was also developed and programmed in-house. The battery system for the EQS SUV is based on a modular architecture that is also used in the EQS and EQE Saloons.

The EQS SUV has a lithium-ion battery with up to 12 cell modules and pouch or hardcase cells. In terms of cell chemistry, a major step towards sustainability has been achieved with this generation of batteries: The optimised active material consists of nickel, cobalt and manganese in a ratio of 8:1:1. This has reduced the cobalt content to less than ten percent. The continuous optimisation of the recyclability is part of Mercedes-Benz's holistic battery strategy (for details, see separate chapter on sustainability). The aim is to be able to dispense entirely with materials such as cobalt through the use of innovative post-lithium-ion technologies.

Intelligent operating strategy for more efficient charging

The battery is integrated into the intelligent thermal management of the EQS SUV. If the intelligent navigation with Electric Intelligence is activated, the battery is preheated or cooled as needed while driving to reach the optimal temperature for efficient charging at the charging point. The desired temperature range of the battery is achieved with the aid of the cooling circuit and a PTC (Positive Temperature Coefficient) booster heater integrated into it.

Complex protection concept for safety

Mercedes-Benz AG applies very high safety standards to all its models. This means that, in many cases, internal Mercedes-Benz safety standards exceed legal requirements. The crash-related requirements in particular are aligned to the "Real Life Safety" philosophy. In the process, findings from internal accident research are incorporated into the development specifications. Alongside verification of crash behaviour, all Mercedes-Benz vehicles undergo additional component tests at the systems level.

[3] 536-660 km are the provisional range figures of the EQS 450+ (WLTP: combined power consumption: 23.0-18.6 kWh/100 km; combined CO_2 emissions: 0 g/km). Data on power consumption and range are provisional and were voluntarily determined internally in accordance with the "WLTP test procedure" certification method. There are no confirmed figures from an officially recognised testing organisation to date. Deviations from the final data are possible.

The battery sits in a crash-protected area in the underbody, embedded in the body shell structure including an extruded aluminium profile on the side. In extrusion, a heated block of metal is forced through dies and transformed into a continuous profile, which is then cut to fit. In this way, highly complex profiles can be produced that are precisely tailored to the requirements. The housing with energy absorbing structures at the front and side as well as a rigid, double-walled base plate provide additional protection for the modules. The test criteria include, among other things, the battery behaviour under impact load and in the event of foreign object penetration. Overheating and overcharging were also simulated and tested. In addition, there is a separate, multi-level safety system for everyday operation. This includes, for example, temperature, voltage or insulation monitoring as a continuously monitoring safety system. If a fault occurs, the battery is switched off.

Production: battery systems from Bibb County

On 15 March 2022, Mercedes-Benz opened a state-of-the-art battery plant in Bibb County, not far from the Mercedes-Benz plant in Tuscaloosa (USA). Production of the high-performance lithium-ion batteries for the EQS SUV is CO_2-neutral. The energy storage units are assembled into a complete system on an approximately 300-metre-long production line with more than 70 workstations. The individual components are assembled in a fully digitised production process, including up to twelve cell modules and what is known as the EE compartment for the intelligent integration of the power electronics. Mercedes-Benz is creating around 600 new jobs in Bibb County.

New safety and training concepts were developed for the employees at the Bibb County plant. Mercedes-Benz attaches particular importance to operational and occupational safety. For example, every team member who has access to the battery plant must complete comprehensive high-voltage safety training. Mercedes-Benz spends a lot of time and money on these special training courses, the more so as they are repeated regularly.

With the new plant, Bibb County will become part of the global Mercedes-Benz battery production network, which includes factories on three continents. These include the locations in Kamenz and Stuttgart (Germany), Beijing (China), Bangkok (Thailand) and Jawor (Poland). The individual factories supply the respective local vehicle production and are also ready for export if required. Mercedes-Benz is investing more than one billion euros in the expansion of its global battery production network.

To localise key suppliers, Mercedes-Benz is partnering with one of the world's leading battery technology companies: Envision AESC. Envision AESC will supply the Mercedes-Benz battery factory in Bibb County with high-performance battery modules from a new plant in the USA. Deliveries are scheduled to begin in the middle of the decade.

Even more functions can be unlocked after buying a car

The new EQS SUV: Over-the-Air-Updates (OTA)

The EQS Saloon was the first model series from Mercedes-Benz in which completely new vehicle functions in several areas can be activated via over-the-air updates (OTA). This means that after the purchase and the original new car configuration, the equipment can still be modified. With the EQS SUV, this offer is now significantly expanded. For example, Trailer Manoeuvring Assist or MBUX Augmented Reality for navigation can be activated at a later date. The OTA functions are available in the Mercedes me Store. In addition to a classic purchase of individual functions for one or three years, subscriptions, temporary activations and free trial phases are also planned.

Updates overnight and new functions the next morning, just like on a computer - OTA technology in the EQS SUV makes it possible. The explicit consent of the user is always a precondition for OTA updates. Mercedes-Benz relies on mobile radio technology and the communication module installed in the vehicle because of the high safety standard.

Here are the functions at a glance:

Function	Description	For activation, this special equipment must be on board
New at the launch of the EQS SUV		
Trailer Manoeuvring Assist	Facilitates manoeuvring with the towing vehicle by automatically controlling the steering angle on the towing vehicle up to a speed of 5 km/h and up to a gradient of 15 per cent.	Trailer coupling, 360° camera[4]
Traffic Sign Assist[5]	Can detect speed limits, overtaking bans and their cancellation, react to red lights, stop signs and entry bans and warn of unintentional crossing or wrong-way entry.	Hard disc navigation, camera[6]
MBUX Augmented Reality Navigation	Superimposes graphic navigation and traffic information on live images	Dashcam
ENERGIZING COMFORT, ENERGIZING COACH	• Selection of comfort and well-being programmes with atmospheric audio accompaniment and on-screen animation as well as appropriate actuation of vehicle functions • Situational recommendation of comfort programmes • Possibility to connect compatible wearables	-

[4] Included in Parking Package with 360° camera or Parking Package with remote parking function
[5] Included in the Driver Assistance package
[6] Part of Collision Warning with Active Brake Intervention, Active Lane Keeping Assist, DISTRONIC PRO adaptive cruise control, Automatic Highbeam Shift, Automatic Main Beam Setting Plus, Speed Limit Sign Recognition

OTA functions already familiar from the EQS Saloon		
Increase in the rear-axle steering angle	Up to 10° steering angle for an even smaller turning circle	
• Beginner's driving mode • Parking service mode	Both modes have smoother driving characteristics with slower acceleration. The maximum speed is limited to approx. 120 or 80 km/h. Activation and deactivation are protected via the Mercedes me profiles.	
Dashcam		MBUX Augmented Reality Navigation[7]
AMG Track Pace	With the help of lap, sector and acceleration times as well as telemetry data, driving skills can be analysed and improved on closed-off tracks.	Hard-disc navigation
Individualisation package	• Additional "Roaring Pulse" Sound Experience • Several entertaining mini-games such as Sudoku, Pairs and Shuffle Puck • More coming-home/leaving light animations such as "Brand World".	DIGITAL LIGHT

Second-hand buyers can use the remaining term of an OTA function purchased by the previous owner. To do this, they must link it to their Mercedes me account in the Mercedes me Store and activate it.

Independently of these new functions, it is also possible to update most of the control units in the vehicle via OTA. This technology saves the customer time, as there is no need to visit a workshop for this purpose. Furthermore, many functions of his vehicle remain up-to-date.

[7] Country restrictions

Highly flexible and comprehensively digitised

The new EQS SUV: the production

In a few months' time, production of the new EQS SUV will begin at the Mercedes-Benz plant in Tuscaloosa (USA). The battery plant in nearby Bibb County, which just opened in March, supplies the batteries for the new Mercedes-EQ model. Production at both sites is carbon-neutral.

The Mercedes-Benz plant in Tuscaloosa, Alabama, has been the production site for large SUVs bearing the three-pointed star since 1997. Mercedes-Benz will soon also produce the all-electric EQS SUV exclusively at the North American plant – as part of its global initiative to produce eight all-electric vehicles at seven sites on three continents. The EQS SUV will be integrated into the running series production of the Mercedes-Benz Tuscaloosa plant. The highly flexible production system of Mercedes-Benz makes it possible to assemble different models and powertrains on a single production line. This is evident in what is known as the "wedding station", for example, where bodywork and powertrain come together. This "full-flex wedding" comprises several modular stations that allow joining different powertrain variants with the respective vehicle bodies on the same assembly line. For example, the EQS SUV is produced on the same line as the conventionally powered SUVs, allowing the plant to adapt quickly to changes in customer demand.

Local battery production is a key success factor for Mercedes-Benz's electrification initiative. The new battery factory, which opened in nearby Bibb County in March, produces the battery systems for the EQS SUV on an approximately 300-metre-long production line with more than 70 workstations. A host of components is assembled into a complete system in a fully digitised production process, including up to twelve cell modules and what is known as the EE compartment for the intelligent integration of the power electronics. The battery for the EQS SUV is based on a modular architecture that is also used in the EQS and EQE Saloons. With the new plant, Bibb County will become part of the global Mercedes-Benz battery production network, which includes factories on three continents. When running at full capacity, up to 600 employees in two-shift operation produce batteries in the six digits annually.

Thanks to comprehensive digitisation with the MO360 production ecosystem and the consistent application of Industry 4.0 technologies, the Tuscaloosa and Bibb County plants operate flexibly and highly efficiently. MO360 obtains real-time information from the most important production processes and IT systems of the approximately 30 Mercedes-Benz passenger car plants worldwide, and integrates important software applications.

As of this year, all of the Mercedes-Benz owned passenger car and van plants worldwide produce on a CO_2-neutral basis, including the Mercedes-Benz plants in Alabama.

Mercedes-Benz has invested more than seven billion dollars overall in Alabama since the 1990s. This includes one billion dollars in the construction of the new battery factory in Bibb County, in the logistics centre and in the flexibilisation of the production sites. At present, Mercedes-Benz U.S. International (MBUSI) employs a workforce of about 4500 and in addition secures some 11,000 more jobs at suppliers and service providers in the region. Since 1997, about four million vehicles rolled off the assembly line at the plant in Tuscaloosa. In 2021 alone, it was some 260,000 SUVs. About two thirds of the annual production output is exported, making MBUSI one of the biggest vehicle exporters in the USA.

With world champion expertise and innovative detailed solutions

The new EQS SUV: aerodynamics

After the EQS and the EQE, the EQS SUV is the third Mercedes-EQ to be based on the modular architecture for large electric vehicles. The optimisation of SUV-typical flow details, for example through turbulators and aerodynamically shaped running boards, delivered a hitherto unique combination of spaciousness and aerodynamic efficiency. To this end, the purpose design with smooth underbody and usually closed radiator shutter of the current aerodynamics world champion for production cars EQS was a good starting point, even if an SUV can never achieve the aerodynamic drag values of a saloon.

Behind the very good aerodynamic performance is a lot of detail work. Great attention was paid to the development of the non-visible details in particular, for example on the underbody. One of the special features of the EQS SUV is the innovative design of the rear diffuser with a pronounced spoiler lip. The design cancels the undesirable flow interaction of the underbody and the form of an estate car rear end without reducing the angle of departure.

For the optionally available running boards, the designers and aerodynamicists were inspired by the underbody of Formula 1 cars. It drops down in the non-visible area on the underside. This directs the airflow behind the wheels and results in a measurable aerodynamic advantage.

Because the axles are installed differently than in the saloons, the underbody panelling with the covers for the electric drive trains (eATS) had to be redesigned. This includes a new sealing concept, but also striking details such as the jagged turbulators in the front part of the underbody. They detach the air vortices in a targeted manner. The flow is directed downwards from the wheel wells. Herringbone-shaped air outlets on the rear floor improve the contact of the underbody flow and direct the rear flow in a desired direction.

Several thousand computational runs were performed in the virtual wind tunnel alone. Below are more details of the aero development:

- Aerodynamically favourable dimensional concept and tyres with optimised geometry
- Aerodynamically optimised wheels and tyres (see also next chapter)
- Continuous seals in the front area, e.g. between service flap, Black Panel and headlamps
- Streamlined design of the A-pillar
- Wheel spoilers at front and rear
- Distinctive side spoilers with all-round spoiler lips.

Extensive sealing and insulation measures reduce wind noise

In an electric car without the usual level of noise from the engine, wind noise is more noticeable by the occupants. That's why the aeroacoustic behaviour is particularly important. In this area, too, the new EQS SUV is one of the best vehicles in its class.

Lots of fine-tuning in the details: in order to reduce or prevent low-frequency noises that can be perceived as reducing comfort, numerous cavities in the car body were filled with acoustically effective foam, for example.

The high-frequency components of the wind noise have also been reduced in the EQS SUV through improved seals on the door handles, the windscreen bracket and the exterior mirrors. The aeroacousticians paid special attention to the seals of the transitions between the six side windows. Another contribution is made by the A-pillar with a specially shaped trim element at the transition to the windscreen. In its development, both modern flow simulations and external noise measurements by means of a special microphone array in the wind tunnel were used. The A-pillar designed in this way not only improves the aeroacoustics, but is also important for a low c_d value and in keeping the windows free of dirt.

The Acoustic Comfort Package further enhances noise comfort. This includes acoustically effective laminated glass on the side windows of the doors. On the panoramic roof, various wind deflectors, covers and seals with improved geometry ensure low noise levels despite the large roof opening.

"Consistently optimising wheels aerodynamically pays off"

The new EQS SUV: interview on the aerodynamic design of wheels

Mercedes offers aero wheels optimised in the wind tunnel for the EQS SUV in sizes 20 to 22 inches. They feature claddings, so-called "aeroblades". The tyre geometry is also optimised, the sidewalls and the transition to the tread are advantageously designed. We spoke to aerodynamicists Benjamin Arnold, Alexander Gensch and Alexander Wäschle about the importance of the wheels for efficiency.

Why have the wheels become the focus of aerodynamic development?

Wäschle: Actually, the wheels just get in the way of the wind. On an aircraft, they are therefore simply retracted. Of course, this is not possible with passenger cars; an alternative would be the cover. But as long as we show the wheels as a design element, we integrate them as best we can under the wheel arches so that as little air as possible hits them directly. But that is not enough. In production vehicles, about one third of the air resistance is still due to the wheels. It is therefore worthwhile to consistently optimise wheels aerodynamically.

The rims are only part of a complex system?

Arnold: By "wheel" we mean the complete wheel, because there is also great aerodynamic potential in the tyres. The wheel spoilers, for example, help to optimise the wheel incident flow - these are the downward-pointing lips on the wheel arches in front of the wheels. The wheel spoilers are getting more and more sophisticated 3D geometries. The cooling air from the engine compartment of models with combustion engines that flows into the front wheel well plays just as important a role as the lateral flow over the front bumper and over the doors and side member trim on the rear wheels.

And unfortunately for you, there is not just one wheel/tyre combination per model series, but many individual variants for the customers.

Wäschle: Precisely. Wheels not only have to roll, be aerodynamic and quiet, have low rolling resistance and plenty of grip. They are also a piece of jewellery and an individualisation option for our customers. Each wheel geometry makes a different contribution to the total air resistance. This means that not just one wheel has to work aerodynamically optimally in its vehicle environment, but quite different wheel designs in different inch sizes. What is more: With each wheel size comes a variety of tyres from different manufacturers. And each one has a different aerodynamic effect. This means that every tyre and every wheel is relevant to certification and thus has an influence on consumption and range. As an aerodynamicist, you can really spin your wheels!

Which details in wheels and tyres offer the greatest aerodynamic potential?

Arnold: On the tyre side, width is the biggest aerodynamic lever. With decreasing tyre width, significant C_d reductions can be achieved. In addition, further improvements can be achieved with optimally designed tyre contours. In the aerodynamic evaluation of the wheels, we pay particular attention to compliance with the "aero ring", the spoke design and a small opening area. The aero ring defines the outer area of the rim and should be a closed ring of adequate width. And many other aerodynamic levers remain our secret, of course ...

How does aerodynamic wheel/tyre development work at Mercedes-Benz?

Wäschle: We have bundled all our knowledge in a cross-series "cross-sectional function wheels/tyres" within aerodynamics. This allows us to reliably transfer the latest aero know-how to all model series and to be the central point of contact for all development areas involved. We scientifically develop new aero potentials and optimise and automate the aerodynamic evaluation of wheels and tyres.

How close is the cooperation with other areas such as design?

Wäschle: In close cooperation with design and the wheel and tyre sector, we have achieved a great deal from which the electric vehicles on our new platform benefit. With a lot of creativity, our design colleagues implement the developed aero guidelines without letting the appearance suffer. A feat that succeeds with a lot of dialogue in the design phase. With the courage to come up with new constructive ideas, we were able to resolve the conflict of objectives between good aerodynamic performance and the weight of aero wheels together with our specialist department colleagues.

Gensch: For the experimental investigations, near-series test parts must be created at an early stage. The hardware design envisages the construction and production of so-called carrier wheels made of aluminium, which can accommodate as many different wheel designs as possible in the form of inlays or trim pieces from the 3D printer. Our own design engineers accompany the entire process, from the construction and the design of the operational stability to the creation of the hardware. The trim pieces are manufactured using various 3D printing processes. Updates in wheel designs, which can be both aerodynamic and design-motivated, can thus be quickly and precisely prepared for assessment on the 1:1 aerodynamic model.

On the road to an emission-free future

The new EQS SUV: a commitment to sustainability

Mercedes-Benz is setting the course for an all-electric future: By the end of the decade, Mercedes-Benz intends to be ready to go all-electric - wherever market conditions permit. With this strategic step from "Electric first" to "Electric only", Mercedes-Benz is accelerating its transformation into an emission-free and software-driven future. In many areas, Mercedes is already thinking about tomorrow today; the new EQS SUV was also designed with this in mind. Resource-saving materials such as secondary steel are also used. Mercedes-Benz looks at the entire value chain, from development and the supplier network to its own production. Mercedes-Benz AG has had its climate protection targets confirmed by the Science Based Targets Initiative (SBTI) based on science. With these goals, the company supports the Paris Climate Accord.

Nine important building blocks of the transformation towards sustainable mobility.

1. Electrified product portfolio

By the end of this year, Mercedes-Benz will offer battery-electric vehicles (BEVs) in all segments in which the brand is represented. From 2025, current planning envisages that all new vehicle architectures will be exclusively electric, and customers will be able to choose an all-electric alternative to each model. The company is significantly accelerating investments in research and development. Between 2022 and 2030, a total of more than 40 billion euros has been earmarked for investments in battery-electric vehicles. The faster expansion of the range of impressive electric vehicles will lead to a faster breakthrough of electric mobility. In 2025, Mercedes-Benz plans to introduce three all-electric architectures: MB.EA, AMG.EA and VAN.EA.

2. Transparent dialogue

Mercedes-Benz has been publishing environmental product information for its vehicles in accordance with ISO guideline TR 14062 since 2005. The documentation, which is checked by external experts, is based on a comprehensive life-cycle assessment of the respective vehicle, in which many environmentally relevant details are documented. The Group's Sustainability Report has provided detailed information on this topic every year since 2006. And the Daimler Sustainability Dialogue has been bringing together sustainability experts from various fields with Daimler representatives every year since 2008. Current and future sustainability issues are discussed in workshops, progress as well as deficits and risks are evaluated, and resulting needs for action are defined. In November 2020, the Daimler Sustainability Dialogue brought together over 200 representatives from business, science, politics, NGOs, associations, trade unions and local authorities in the digital space.

3. On the balance sheet: CO_2-neutral production

An important milestone is the CO_2-neutral production in all of Mercedes-Benz AG's own plants worldwide as of this year. To achieve climate-neutral production, emissions generated in Mercedes-Benz vehicle production and in the energy supply of the plants are consistently reduced, or avoided altogether where possible. The purchase of green electricity is an important part of this. That is why all of Mercedes-Benz AG's own production plants worldwide exclusively procure electricity from renewable sources since 2022 – including the Mercedes-Benz plants in Alabama. Tuscaloosa and Bibb County.

Mercedes-Benz AG has announced that 70 per cent of energy requirements in production will be met by renewable energies by 2030. The Group as a whole plans to cover 100 per cent of its electricity needs and more than 70 per cent of its energy needs from renewable sources.

4. Aim: sustainable battery production

Sustainability was a central aspect of the planning of the new battery plant in Bibb County (USA), starting with the particularly energy-efficient building design. For example, hot water is generated with solar thermal energy and rainwater is collected and used to conserve valuable natural resources. Other sustainable measures include the intelligent and highly efficient control of the LED lighting and ventilation in the battery assembly area. In addition, there are air conditioning systems that work with environmentally friendly refrigerants and modern, energy-saving process technology. The forklifts are powered by hydrogen instead of diesel fuel.

In line with the Mercedes-Benz strategy to expand renewable energy generation at all plants, the entire electricity demand of the Bibb County site will be covered by renewable energy sources from 2024 onwards - once the planned solar energy projects have been approved.

In addition, Mercedes-Benz has entered into a five-year partnership with "The Nature Conservancy" worth more than $600,000 to support the "Working Woodlands" in northeast Alabama. "Working Woodlands" campaigns for the preservation, restoration and promotion of sustainable forestry as well as near-natural concepts. This also includes the protection of wildlife. The long-term project also contributes to the fulfilment of Mercedes-Benz's sustainable corporate strategy "Ambition 2039" to have a carbon-neutral vehicle fleet by 2039.

5. Decarbonisation of the supplier network

More than 40 per cent of the steel required for the body shell comes from the resource-saving secondary route. More than 100 kg of steel scrap is used as secondary raw material. In addition to a recycling rate of over 50 per cent, the circumferences have a significantly reduced carbon footprint compared to the blast furnace route. In general, the supplier network provides a considerable part of the value creation and is thus of crucial importance for the decarbonisation goals. Suppliers, who account for around 90 per cent of the annual purchasing volume, have already signed an Ambition Letter and have agreed to supply only carbon-neutral parts in the future. From 2039 at the latest, only production materials which have been produced on a CO_2-neutral basis at all value creation stages will be allowed through the Mercedes-Benz plant gates. A supplier declining to sign the Ambition Letter will not be eligible for new supply contracts. In addition, there is the agreement on concrete CO_2 measures with logistics suppliers. At the beginning of 2020, rail transport in Mercedes-Benz transport logistics was converted to a CO_2-neutral energy supply with Deutsche Bahn.

6. Raw materials from certified mining

Mercedes-Benz looks at the entire value chain, from development and the supplier network to its own production. Responsibly mined and processed raw materials provide the foundation for a sustainable electric vehicle fleet. Mercedes-Benz has therefore had the complex supply chains of its battery cell suppliers audited according to OECD standards. For this purpose, more than 183 companies were identified and more than 60 audits were carried out according to the guidelines of the OECD (Organisation for Economic Co-operation and Development). The aim is for the company to source exclusively battery cells with cobalt and lithium from certified mining in the future[1]. In addition, Mercedes-Benz is making the "Standard for Responsible Mining" of the "Initiative for Responsible Mining Assurance" (IRMA) a key criterion for supplier decisions and contracts in raw material supply chains and will only work with suppliers who agree to these requirements.

7. Resource-conserving materials

EQS SUV components with a total weight of around 70 kg are made proportionately from resource-conserving materials (recycled materials and renewable raw materials). These include, for example, the cable ducts. They are made from 100 per cent post-consumer recycled material.

[1] For more information, see here

8. Greened electricity

Since 2021 Mercedes-Benz has ensured a subsequent offset with green electricity when customers use Mercedes me Charge[2] to charge their cars in Europe. It is ensured that for charged energy quantities corresponding amounts of green electricity are fed into the grid after the actual charging process and, in addition, incentives are created to invest in renewable energy plants. There is no basic fee for Mercedes me Charge for the first three years after the purchase of an EQS SUV.

9. Sustainable battery usage is the goal

Mercedes-Benz takes a holistic approach to the battery life cycle: re-use, remanufacture, recycle. Mercedes-Benz offers remanufactured batteries for all electric vehicles in order to do justice to the idea of a closed-loop economy and to conserve resources. Once the high-voltage batteries of the Mercedes-EQ fleet reach the end of their life on the road, it's far from over. Mercedes-Benz Energy, based in Kamenz, is a subsidiary of Mercedes-Benz AG responsible for the development of innovative energy storage solutions. By building stationary energy storage systems, electric car batteries can be connected to the grid. The spectrum for large-scale storage applications from Mercedes-Benz Energy ranges from peak load balancing and black start (power plant start-up independent of the power grid) to uninterruptible power supply (UPS). The company's focus is in particular on applications from the 2nd life and replacement parts storage unit sector. Only after this is it time for material recycling.

10. Battery recycling

In addition to a circular economy and value retention, Mercedes-Benz is also committed to recycling. With a view to the future recycling of lithium-ion battery systems from Mercedes-EQ vehicles, the company is expanding its global strategy for battery recycling. In Germany, Mercedes-Benz begins construction of its own battery recycling plant based on hydrometallurgy. Analogous to this technology, the company plans to close the recycling loop with high-tech battery recycling partners in China and the USA.

[2] In order to allow use of the Mercedes me connect service "Mercedes me Charge", a separate charging contract with a selected third-party provider is required for charging payment and billing purposes. A personal Mercedes me ID and agreement to the Terms of Use for the Mercedes me connect services are required for use of the Mercedes me connect services.

Avant-garde and luxurious

The new EQS SUV: the interior design

The EQS SUV combines a particularly generous sense of space with a luxurious and avant-garde interior design. In addition to the MBUX Hyperscreen, the designers relied on consistent digitisation for many other elements. New is an innovative hybrid trim piece: The wood trim elements with Mercedes-Benz Pattern as aluminium inlays are the modern, high-quality interpretation of this classic inlay technique.

Like the EQS Saloon, the EQS SUV is based on an all-electric platform. For the designers, this went hand in hand with the vision of systematic digitisation of the interior. The optional MBUX Hyperscreen impressively implements this vision: the entire instrument panel is one ultimate widescreen. The real glass appears to extend three-dimensionally across the entire width of the vehicle in a wave-like pattern. The high-resolution screens merge seemingly seamlessly under the shared glass cover.

The vent band spans across the entire width at the top and is very slim at the same time. These extreme proportions, together with the glass wave of the MBUX Hyperscreen, create the avant-garde architecture of the cockpit. For further details on the MBUX Hyperscreen, see the relevant separate chapter.

The dominant outer vents have a turbine design. They deliberately play on the theme of "hyperanalogue" through the contrast between high-tech precision mechanics and digital, glass display world. The intricately designed turbine blades distribute the airflow efficiently.

The front section of the centre console joins the instrument panel and is free-standing in space. It is a visual reference to the new drive architecture – due to the electric powertrain, no transmission tunnel is necessary. Because the distance to the centre console is greater, the high-quality stowage tray in the centre of the footwell offers more space for accessories than its counterpart in the EQS Saloon.

Flowing leather surfaces with intricate seam patterns create a lot of stowage space in combination with a large cover made of real wood. The visual impression is both modern and luxurious.

The base model without MBUX Hyperscreen has a slightly different centre console. There is a soft armrest in the rear section. It is first visually interrupted before being transitioned into the floating central display.

The design of the door panels borrows from the interior design of modern living spaces. Doors and their centre panels emerge from behind the dashboard, spanning the entire space. A surface-mounted modular body floats like a sideboard in front of the door panel. It accommodates all necessary door elements such as armrest, door module, handle and map pocket. Circular ambient lighting completes this floating, avant-garde aesthetic in the dark.

The Electric Art equipment line includes luxury seats with lavishly crafted covers. Piping emphasises the hand-finished character. In combination with AMG Line interior, the customer receives SUV sports seats with non-integrated head restraints.

The second row of seats have luxury head restraints as standard on the outer seats. A third row of seats is available as an option for the EQS SUV. For interior dimensions, functions and comfort features of the seats, see the chapter on the dimensional concept.

Colour & trim: avant-garde and tradition for a special ambience

Technologically pioneering as well as traditional materials and colours lend the interior a special atmosphere.

The modern, delicate NEOTEX structure combines the look of nubuck leather and high-tech neoprene. It is found on the instrument panel, the armrest and the seats of the Electric Art Line.

Seven coordinated colour combinations in the interior emphasise the generous sense of space. The EQS SUV is immersed in a progressive and luxurious colour scheme of warm and cool tones. Colours such as balao brown-neva grey and space grey-macchiato beige add the finishing touches to the soft and emotive design.

The trim parts make a decisive contribution to the aesthetics in the EQS SUV. New features include the innovative wood trim elements with Mercedes-Benz Pattern as aluminium inlays. The star pattern is lasered into open-pore ash wood. A stainless steel sheet is pressed on from the back and pushed through the star-shaped cavities - the modern interpretation of an inlay with a quality and precision previously unknown in this segment.

The anthracite 3D relief look trim elements with fine metal pigments and laser cut, backlit with Mercedes-Benz Pattern, also provide a special ambience. The star pattern is lasered into the plastic trim and is adaptively backlit. Wood trim elements are also available, for example, anthracite open-pore line-structure lime wood or open-pore walnut ship's deck wood.

A special welcome & goodbye scenario[1] has been developed for the Mercedes-EQ models, which is also coordinated with the ambient lighting.

UX design: multiple display styles and modes to choose from

The MBUX Hyperscreen is available as a high-end feature. It shapes the display world in the cockpit area. The driver, central and passenger displays merge into one.

During the start animation on the screens, the new Mercedes-EQ trademark appears on the central display for a few seconds: a highly stylised blue laurel wreath encircles the lettering of the Mercedes-Benz electric brand.

The functional content and operating structure correspond to the EQS Saloon and, like there, are adapted to electric driving. Visually, all graphics are designed in a consistent blue/orange colour scheme. The classic cockpit display of the two round dials has been reinterpreted with a digital light sabre in a glass lens. All content relevant to driving can be accessed between the round dials.

An alternative display mode to the two tubes is the "Pure EV" mode: A 3D performance bar graph emotively and impressively conveys the respective driving status (Drive, Accelerate, Charge). The central object here is a "G-force puck", which dynamically moves freely in space in line with the acceleration forces.

The appearance of the screens can be individualised with three display styles (Discreet, Sporty, Classic) and three modes (Navigation, Assistance, Service).

[1] Available in combination with the Burmester® surround sound system

For a calm interior impression, the content of the displays in discreet mode is reduced as much as possible and coordinated with the colour change of the ambient lighting in seven screen colour worlds. In "Assistance" mode, important events such as lane changes or specified distance control as well as the infrastructure and detected other road users (cars, motorcycles, trucks) are displayed.

Fewer operating steps thanks to artificial intelligence

The new EQS SUV: MBUX (Mercedes-Benz User Experience)

With the EQS Saloon, MBUX (Mercedes-Benz User Experience) reached a new level. The second generation of this system is also used in the EQS SUV. With adaptive software, the display and operating concept adapts completely to its users and makes personalised suggestions for numerous infotainment, comfort and vehicle functions. With the zero-layer design, the user does not have to scroll through submenus or give voice commands. The key applications are always offered on the top level in the field of vision, depending on the situation and context. This relieves the driver of numerous operating steps. The immersive Dolby Atmos® sound system revolutionises the sound experience and expands the classic surround sound. It is available with the Burmester® surround sound system.

The infotainment systems offer numerous and extensive functions. Several operating steps are often required to control them. In order to reduce these interactive steps even further, Mercedes-Benz employed artificial intelligence to develop a user interface with context-sensitive awareness.

The MBUX system proactively displays the right functions at the right time for the user, supported by artificial intelligence. The context-sensitive awareness is constantly optimised, both by changes in the surroundings and by user behaviour. The 'zero layer' offers the user dynamic, aggregated content from the entire MBUX system, and thus the associated services, on the uppermost level of the MBUX information architecture.

The navigation application with its full range of functions is therefore always in the centre of the display unit. Over 20 other functions – from ENERGIZING COMFORT to birthday reminders and suggestions for the to-do list – are automatically offered with the help of artificial intelligence when they are relevant to the customer. The developers have internally christened these suggestion modules displayed on the zero-layer interface "magic modules".

Here are five representative use cases. The user can accept or reject the respective suggestion with just one click:

- When approaching a charging station that is enabled for Plug & Charge, the magic module 'Charging' automatically appears. The driver can then start charging immediately.

- If someone always calls one particular friend on the way home on Tuesday evenings, in future they will always receive a suggestion regarding this particular call on this day of the week and at this time. A business card appears with their contact information and – if this is stored – their photo. All the suggestions from MBUX are linked with the profile of the user. If someone else is driving the EQS SUV on a Tuesday evening, this recommendation will not be made - or another one will be made, depending on the preferences of the other user.

- If the driver regularly uses the hot stone massage function in winter, the system learns and automatically suggests the comfort function for winter temperatures.

- If the user regularly switches on the heating of the steering wheel in addition to the seat heating, for example, this is suggested to them as soon as they activate the seat heating.

- The chassis of the EQS SUV can be raised to provide more ground clearance. A useful function for steep driveways or speed bumps on the ground for traffic calming ("sleeping policemen"). MBUX remembers the GPS position where the user has made use of the "Raise Vehicle" function. If the vehicle approaches this GPS position again, MBUX automatically suggests raising the EQS SUV.

MBUX: a milestone as the interface between driver, passengers and vehicle

The EQS SUV features the latest MBUX generation. As standard, the EQS 450+ (WLTP: combined power consumption: 23.0-18.6 kWh/100 km; combined CO_2 emissions: 0 g/km)[2] is equipped with a 12.3-inch driver's display and a 12.8-inch central display in portrait format. The impressive MBUX Hyperscreen (see next chapter for details) is available as an option. There, the front passenger also has their own screen.

Hey Mercedes: the voice assistant can now do even more

Compared with the previous MBUX generation, the "Hey Mercedes" voice assistant is even more capable of dialogue and learning by activating online services in the Mercedes me App[3]. Moreover, certain actions can be performed even without the activation keyword "Hey Mercedes". These include taking a telephone call. "Hey Mercedes" now also explains vehicle functions, and can help when asked how to connect a smartphone by Bluetooth or where the first-aid kit can be found, for example. Compatible home technology and household devices can also be networked with the vehicle thanks to the smart home function and controlled from the vehicle by voice. "Hey Mercedes" is now also able to recognise vehicle occupants by their voices. Once the individual characteristics of the voice have been learned, this can be used to access personal data and functions by activating a profile.

The voice assistant in the EQS SUV can also be operated from the rear. In general, rear passengers experience the same comprehensive infotainment and comfort offerings as the driver and front passenger. They have up to two rear-seat screens plus a tablet and a wide range of intuitive controls.

MBUX High-End Rear Seat Entertainment Plus: comfort like in the front row

Screen content can be quickly and easily shared with other passengers. Selection and modification of navigation destinations also is possible from the rear seats. MBUX High-End Rear Seat Entertainment Plus comprises two 11.6-inch displays with touch controls on the backrests of the driver and front passenger seats. The MBUX rear tablet is also optionally available. It is a fully fledged tablet and can also be used outside the vehicle. In addition, apps (Android) can be installed. With this convenient remote control, all rear seat entertainment functions can be comfortably controlled from any seat position.

Using cameras in the overhead control panel and learning algorithms, the MBUX Interior Assistant recognises and anticipates the wishes and intentions of the occupants. It interprets which way the head points, hand movements and body language and reacts with appropriate vehicle functions. As well as enhancing operating convenience, the MBUX Interior Assistant improves safety. If it is switched on, the vehicle exit warning of Blind Spot Assist is already issued when a hand approaches the door handle. It can also detect a child seat on the front passenger seat and signal on the central display if the vehicle seat belt is not buckled.

Dolby Atmos®: Close to the real live music experience

The Dolby Atmos immersive sound system® takes the audio experience in the EQS SUV to a new level. Individual instruments or voices of the studio mix can be placed all around the listening area. A new kind of sound animation thus becomes possible: This is because while conventional stereo systems usually have a left-right dynamic, Dolby Atmos® can use the entire space and create a 360-degree experience.

Dolby Atmos® is offered with the Burmester® surround sound system, which has 15 speakers.

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[2] Data on power consumption and range are provisional and have been voluntarily determined internally in accordance with the "WLTP test procedure" certification method. There are no confirmed figures from an officially recognised testing organisation to date. Deviations from the final data are possible.
[3] To use the Mercedes me connect services, customers must create a Mercedes me ID and agree to the terms of use for the Mercedes me connect services. The services shown and their availability and functionalities depend in particular on the vehicle model, year of manufacture, selected special equipment and country.

Online music: music streaming with millions of songs to choose from

Mercedes-Benz has completely integrated many music streaming providers into the MBUX infotainment system with the "Online Music"[4] service. MBUX enables access to the personal user profile at the linked music providers. This allows customers to seamlessly access their favourite songs and playlists and discover millions of songs as well as curated playlists. Operation is intuitive using the MBUX voice assistant via "Hey Mercedes" and via touch controls on the steering wheel or central display.

Personalisation is simple and convenient

A personal profile can be created directly in the EQS SUV and synchronised with existing profile data in the Mercedes me account. By scanning a QR code with the Mercedes me App, the vehicle is automatically connected to the Mercedes me account.

Personal preferences such as a favourite radio station and preselected settings can be transferred to any seat via the personal Mercedes me profile. Up to seven different profiles with a total of around 800 parameters are possible in the vehicle. The ambient lighting can be individually set by remote configuration, e.g. from home. As the profiles are stored in the cloud as part of Mercedes me, the profiles can also be used in other Mercedes-Benz vehicles with the new MBUX generation.

In addition to the classic entry of a PIN, a special authentication procedure ensures a high level of security. Fingerprint, face and voice recognition are combined. This allows access to individual settings or verification of digital payment processes from the vehicle.

[4] In order to be able to use the Online Music service, customers will require a separate personal contract with a selected streaming provider.

Welcome to the big in-car show

The new EQS SUV: the MBUX Hyperscreen

The MBUX Hyperscreen is the absolute highlight in the interior. This large, curved screen unit spans almost from A-pillar to A-pillar. Three screens sit under a common bonded glass cover and visually merge into one display. In addition to the zero-layer design, the MBUX Hyperscreen offers intuitive touch operation with haptic feedback and force feedback. The scratch-resistant glass is coated to make cleaning easier.

With the MBUX Hyperscreen, three displays merge almost seamlessly into one another to create an impressive screen band over 141 centimetres wide: driver's display (screen diagonal: 12.3 inch), central display (17.7 inch) and front passenger display (12.3 inch) appear as one visual unit.

The selected display style is shown uniformly on all screens; and the brightness is homogeneously adapted to the lighting conditions in the interior. The control panels for the automatic climate control system are located in the lower area of the central display. These remain permanently displayed so that the driver and front passenger can directly adjust the temperature and ventilation.

For particularly brilliant display quality, OLED technology is used for the central and front passenger displays. Their individual pixels are self-luminous; non-actuated image pixels remain switched off, which means that they appear deep black. The active OLED pixels, on the other hand, shine with a high colour brilliance, which also means high contrast values – irrespective of the viewing angle and the lighting conditions.

The central and front passenger displays also provide haptic feedback. When a finger touches certain spots on the touch screen, actuators (eight in the central display, four in the front passenger display) trigger a perceptible vibration of the glass cover. The user thus feels pulses on the smooth surface, which give the impression of a mechanical switch. Another operating aid known from high-quality consumer electronics products is the force feedback of both displays. For this purpose, a metallised foam is integrated into the device as a force sensor. Different levels of pressure on the glass change the response. For example, MBUX then jumps to another menu level.

The 12.3-inch OLED display for the front passenger gives them their own display and control area, making journeys more enjoyable and entertaining. They can watch dynamic content such as streaming video or TV during the drive. The system uses an intelligent, camera-based blocking logic that recognises if the driver is looking toward the front-passenger display. If this is the case, the system automatically dims the dynamic content. If the front passenger seat is not occupied, the screen becomes a digital decorative image. The customer can choose from various decorative images, including a starry sky, i.e. the Mercedes-Benz Pattern.

The curved glass cover is made of particularly scratch-resistant aluminium silicate glass and is coated to make cleaning easier. For example, fingerprints can be easily removed with a microfibre cloth.

Ergonomic, sophisticated, robust: the development

During the development of the MBUX Hyperscreen, Mercedes-Benz engineers carried out extensive ergonomics studies with visible light beams. The result is an optimised alignment of the MBUX Hyperscreen to reduce reflections caused by the curvature of the glass cover. In addition, the upper part of the windscreen is shaded by a tinted strip.

Other details designed with the hallmark Mercedes-Benz meticulousness include the brightness of all three screens, which is adjusted to the respective ambient conditions. A light sensor above the central display is used to determine the illumination level in the driver and front passenger areas. In addition, the camera

integrated in the driver's display measures the ambient brightness. Both the brightness and the image content of the displays are then adjusted. At the same time, this algorithm is less susceptible to scattered light and thus to misinterpretation of the measurement system.

Tolerance to high temperature differences, immunity to vibrations, and protection against dust are among the tough automotive requirements for which the entire system has been designed. Age-related burn-in effects of OLED displays are countered with the help of various technical solutions. The ageing process of each individual pixel is permanently monitored and an automatic adjustment is carried out in the background to compensate for it. In addition, the displayed image information rotates slightly and imperceptibly counter-clockwise to reduce permanent strain.

Curved, bonded and printed: the production

The large glass cover is curved three-dimensionally using the moulding process. This hot forming of glass at process temperatures of approx. 650°C places the highest demands on mould making and process control and is used in the production of optical glass for camera lenses and smartphone glass covers. With the MBUX Hyperscreen, this process enables a distortion-free view of the displays across the entire width of the vehicle, regardless of the radius of the glass cover.

All displays are transparently bonded to the glass cover for a uniform refractive index curve to avoid reflections as much as possible. The central and front passenger displays are optically connected to the glass cover under vacuum. This dry-bonding process uses an adhesive material similar to double-sided adhesive tape. The LCD driver's display, which is flat owing to its design, uses a wet bonding process in which the adhesive material is liquid to compensate for the radius of the glass cover.

The black areas between the screens are printed onto the glass cover from behind using a screen printing process specially adapted to the curvature. The colour of the black print was adapted to the reflection behaviour of the OLED displays in order to achieve a homogeneous overall impression in a wide variety of lighting situations. For certain important warning lights to the right and left of the driver's display, a mask is used during the screen printing process to leave out the corresponding symbol.

The MBUX Hyperscreen is surrounded by a continuous plastic front frame. This visible part is painted in "Silver Shadow" using an extensive three-coat process. This paint system achieves an especially high-quality surface impression through extremely thin intermediate coats. The integrated ambient lighting in the lower section of the MBUX Hyperscreen make the display unit seemingly float on the instrument panel.

Extensive precautions: the safety measures

The MBUX Hyperscreen is bolted directly to the cockpit cross-member for stability: the connection to a stabilising magnesium support as the structural component of the MBUX Hyperscreen is made via aluminium brackets. Their honeycomb structure allows them to deform in a controlled manner in a crash. For reasons of side impact protection, the glass cover also does not extend all the way to the doors. In the event of a severe side impact, there are also predetermined breaking points behind the side air vents.

Important information as projection

The new EQS SUV: the equipment highlights DIGITAL LIGHT and head-up displays

DIGITAL LIGHT headlamp technology (special equipment) enables innovative functions, such as the projection of auxiliary markings or warning symbols onto the road. Other equipment highlights are the head-up displays, available in two sizes. The large Augmented Reality Head-up Display (AR-HUD) shows relevant information and actions three-dimensionally in the real driving situation. The technology of DIGITAL LIGHT and AR-HUD is known from video projectors.

DIGITAL LIGHT has a light module with three extremely powerful LEDs in each headlamp, whose light is refracted and directed by 1.3 million micro-mirrors. The micro-mirrors occupy the area of a thumbnail. A control unit with a powerful graphic processor uses an HDMI-like connection to generate a continuous video stream to the mirrors.

These assistance functions are special features[1]:

- Warning of recognised roadworks by projecting an excavator symbol onto the road surface
- Aiming a spotlight at pedestrians detected at the roadside as a warning
- Traffic lights, stop signs or no-entry signs are pointed out by projecting a warning symbol onto the road surface
- Assistance on narrow road lanes (roadworks) by projecting guiding lines onto the road surface
- Indication of the start of cooperative lane change
- Warning and directional guidance when Lane Keeping Assist or Blind Spot Assist detects a hazard

The topographic light takes hills into account on the basis of navigation maps, especially crests and dips:

Two different head-up displays (HUD) are optionally available, including an innovative augmented reality variant (AR-HUD) with an especially large image. The opening angle of the display is 10 degrees horizontally and 5 degrees vertically, the image is at a virtual distance of 10 metres (basic HUD: 4.5 metres: This display area corresponds to a monitor with a 77-inch diagonal. The AR-HUD provides extensive augmented reality content for driving assistance systems and navigation information. They blend into the surroundings ahead of the vehicle for the driver, and can therefore contribute to reducing distraction further. The imaging unit consists of a high-resolution matrix of 1.3 million individual mirrors and a highly efficient light source.

[1] Due to the approval regulations, the availability and scope of functions may be restricted depending on the market.

Different soundscapes for an individual acoustic set-up

The new EQS SUV: the Sound Experiences

Electric cars are inherently quiet. If desired, the ride in the EQS SUV can nevertheless become an acoustic experience: with a holistic sound production, the sound experts from Mercedes have made the paradigm shift from the combustion engine to the electric car acoustically perceptible. A total of three soundscapes are available. A separate interior driving sound is optionally available for each soundscape. It adjusts adaptively to the driving style and driving mode.

A variety of soundscapes allows for an individual acoustic set-up. If the Burmester® surround sound system is on board, the EQS SUV features the two soundscapes Silver Waves and Vivid Flux. Silver Waves is a sensuous and clean sound. Aimed at EV enthusiasts, Vivid Flux is crystalline, synthetic yet humanly warm. They can be selected or switched off as Sound Experiences on the central display.

Another soundscape can be unlocked using over-the-air technology. "Roaring Pulse" fits the character of the SUV particularly well. This Sound Experience is reminiscent of powerful machines, and is sonorous and extroverted.

Driver and passengers are already greeted acoustically when approaching the vehicle and when getting in. A corresponding Aura sound also accompanies the exiting and locking of the EQS SUV. Also part of the particular soundscape is the driving sound, which is reproduced by the speakers in the interior. It stirs emotions and inspires. At the same time, the driving sound is interactive, as it responds to a good dozen parameters such as the accelerator position, speed or energy recovery. The choice of driving mode also influences the driving sound; in SPORT mode, for example, the sounds become more dynamic and further effects are activated. The amplifier of the Burmester® surround sound system uses intelligent sound design algorithms to compute the sounds in real time, and the speakers reproduce them.

The algorithms and sounds for the sound design are created in-house at Mercedes-EQ. In addition to physicists, the interdisciplinary team also includes sound designers, media designers and mechatronics specialists. They work on the sound of the EQS SUV and its sibling models in the acoustics laboratory, which is completely shielded from external noise and vibrations. The sound experts determine which emotions the soundscapes evoke in real traffic during test drives. The mobile listening tests take place with interactive demonstrator vehicles, including at the new Immendingen Test and Technology Centre (PTZ).

In order to achieve an interplay between the driver's action, the vehicle's reaction and the feedback of the sound, musical composition such as harmony theory is not the only foundation. The vividness of the soundscape varies as the result of many sound dimensions. In this way, the sound design creates a holistic, multi-sensory experience that interacts with the entire vehicle. This experience is somewhere between comfortable quiet on the one hand and precise feedback with emotionally appealing design on the other.

Air purification at the highest level

The new EQS SUV: ENERGIZING AIR CONTROL Plus

Unfortunately, we have to stay outside, says the EQS SUV to particulate matter, microparticles, pollen and other substances. This is because its HEPA filter (High Efficiency Particulate Air) cleans the incoming outside air at its very high filtration level. In recirculation mode, the air is filtered by the interior air filter of the automatic climate control system. The activated charcoal in the HEPA and cabin air filters reduces sulphur dioxide and nitrogen oxides as well as odours. The HEPA filter is part of ENERGIZING AIR CONTROL Plus and uses the space under the front bonnet of the EQS SUV. In 2021, following an application by Mercedes-Benz, the Austrian Research and Testing Institute (OFI) awarded the interior air filter of this optional feature its "OFI CERT" ZG 250-1 certification for viruses and bacteria.

The system is based on filtration, sensors, a display concept and air conditioning. In combination with the intelligent fresh air/recirculating air switching, ENERGIZING AIR CONTROL Plus ensures good air in the vehicle interior. The fine particle levels outside and inside are also displayed in real time in MBUX. Using pre-entry climate control, it is also possible to clean the interior air before getting into the vehicle.

Thanks to its purpose design, the EQS SUV has a very large filter system under the front bonnet. At 596/412/40 millimetres, the HEPA filter has almost the area of a sheet of A2 paper (420/594 mm), i.e. it is about four times the size of a sheet of A4 paper. At 9.82 dm³, its volume is almost ten litres. Filtration takes place in three stages. A coarse pre-filter retains leaves, snow and sand and traps larger particles. At the same time, it protects the HEPA filter from a high concentration of coarse particles. The separation in this HEPA (High Efficiency Particulate Air) filter uses a mechanical process by means of a synthetic membrane: the microfibre layer traps fine particles of the so-called class PM 2.5 to PM 0.3; these particles are therefore smaller than 2.5 µm. Up to 99.75 percent of particles are separated out, according to the filter's efficiency as certified by DIN EN 1822. The reduction of pollutants achieved at the filter is comparable to that in clean rooms and operating theatres.

In the final, third step, the cabin air filter reduces further fine particles as well as sulphur dioxide, nitrogen oxides and unpleasant odours. The filtration of sulphur dioxide and nitrogen oxides is carried out by special activated carbons in the HEPA filter and the cabin filter. Due to their pore structure, they have a very large inner surface area. Around 600 grams of activated carbon are used in the HEPA filter of the EQS SUV. The adsorption area is equivalent to about 150 football pitches. The activated charcoal is produced from coconut shells, which are a by-product of the cosmetics industry.

In 2021, Mercedes-Benz successfully applied to the Austrian Research and Testing Institute (OFI) for its "OFI CERT" ZG 250-1 certification for the interior air filter[1]. Air filters with this certificate reduce certain bacteria and viruses directly at the filter. To prove their quality, the air filters must pass standardised tests and are tested using additional scientific analyses. Test results certify that the ENERGIZING AIR CONTROL Plus cabin air filter is safe for the tested viruses[2] and bacteria.[3]

- Virus[2] capturing capacity of more than 86 percent when new
- A virus[2] capturing capacity of more than 80 percent in aged condition after climate change test with different temperatures and humidities
- Bacteria[3] capturing capacity of more than 90 percent when new
- A bacteria[3] capturing capacity of more than 88 percent in aged condition after climate change test

[1] ZG-250-1 (ofi.at)
[2] Tested using test virus MS2 bacteriophages on the filter
[3] Tested using Kocuria varians test bacteria on the filter

- Very low re-release of filtered viruses on the back of the filter below the infection threshold

Always informed: display of fine particle values outside and inside the vehicle
Combined with the automatic fresh air/recirculating air mode, ENERGIZING AIR CONTROL Plus ensures good air quality inside the vehicle. The air quality sensor supports the switching between fresh air and recirculation, and detects odours and nitrogen oxides as well as carbon dioxide in the outside air. The air-conditioned recirculated air is filtered several times in recirculation mode, and flushing with fresh air takes place at regular intervals. Using pre-entry climate control, it is also possible to clean the interior air before getting into the vehicle.

The particulate levels outside and inside the vehicle are also displayed in MBUX. They can be viewed in detail in the dedicated Air Quality menu. If the quality of the outside air is poor, the system can also recommend closing the side windows or the sliding sunroof.

No.6 MOOD mimosa: an earthy fragrance with a touch of sensuality
The active fragrancing of the EQS SUV, which is part of the AIR-BALANCE Package, likewise engages the sense of smell. A special fragrance was composed for the new electric model: No.6 MOOD mimosa is an earthy fragrance with a touch of sensuality.

The fragrance components unfold in three phases. The top, heart and base notes are coordinated and form a harmonious whole. The top note conveys the first fragrance impression. In the case of No.6 MOOD mimosa, it is dominated by the aromas of violet, orange, black currant and raspberry. Cyclamen, jasmine, geranium and mimosa, on the other hand, determine the middle phase of the fragrance, i.e. the heart note. The base note smells the longest and gives the perfume a certain profundity. It contains woody and resinous fragrance nuances of tobacco, cedar, sandalwood and honey.

The nomenclature of the Mercedes fragrances is composed of an iconic number of the respective brand, the designation "MOOD" and the main ingredient of the fragrance. The Mercedes-EQ fragrances bear the number 6, as the first electric cars were added to the model range in 1906 with the "Mercédès Electrique" vehicles. Their electric wheel hub motors were powered by a battery. They were available as passenger cars, trucks, buses, ambulances and fire engines in a wide variety of designs.

Acoustic oases, power nap and individual comfort recommendations

The new EQS SUV: ENERGIZING COMFORT

In the EQS SUV, ENERGIZING COMFORT includes the three ENERGIZING NATURE programmes Forest Glade, Sound of the Sea and Summer Rain. These provide an immersive and impressively realistic on-board sound experience. These calming sounds were created in consultation with acoustic ecologist Gordon Hempton. As with the other ENERGIZING COMFORT programmes, other senses are engaged with lighting moods and images. A new feature of the short sleep programme during a break is the expanded conditioning of the interior: it closes the roller blind of the panoramic sliding sunroof (special equipment) and moves the driver's seat into the reclined position. This creates an atmosphere that is conducive to sleeping. The power nap can increase the driver's performance and give them new energy.

The ENERGIZING NATURE programmes at a glance:

- Forest Glade: can help to escape the noisy daily routine and boost concentration. Birdsong, rustling leaves and a gentle breeze create a feel-good ambience. The programme is rounded off by warm music soundscapes and subtle fragrancing.
- Sounds of the Sea: can have a positive and relaxing effect through the combination of soft music soundscapes, sounds of the surf and seagull sounds. Warms and cools at the same time with the soothingly slow rhythm of the ocean waves combined with blasts of air from the air conditioning system.
- Summer Rain: can serve as an acoustic oasis in noisy traffic, cooling and calming with sounds of raindrops on leafy canopies, distant thunder, pattering rain and ambient music soundscapes.

The sounds are based on the "Quiet Planet" audio library, which acoustic ecologist Gordon Hempton has created over the years. The Mercedes-Benz sound design department has arranged the sounds into ten-minute pieces and mixed them for the in-car experience. Individual musical compositions enhance the overall impression of the sounds of nature and their calming effect.

Power Nap: short recovery programme for driver and co-driver during a break

During a break in the journey, e.g. at a service area or charging station, the Power Nap program can be selected. The program has three phases – falling asleep, staying asleep, waking up – and can increase the driver's performance and give them new energy. A new feature of the short sleep programme during a break is the expanded conditioning of the interior: The EQS ensures a sleep-promoting atmosphere by moving the front seat participating in the programme to a reclined position, closing the side windows and blinds, activating the ionisation of the incoming and circulating air, and adjusting the ambient lighting accordingly. Soothing sounds and the depiction of a starry sky on the central display support falling asleep - if Power Nap has been started for the front passenger seat, this also appears on the front passenger display.

Waking up is accompanied by a pleasantly activating soundscape, appropriate fragrancing as well as a briefly active subtle massage and seat ventilation. Finally, the seat is moved upright again and the roller blind in the roof lining is opened. This ends the programme and returns the driver to the task of driving.

ENERGIZING COMFORT and ENERGIZING COACH: comfortable travel while staying fit

The ENERGIZING COMFORT range in the EQS SUV is based on the further developed system of the S-Class. So in addition to the three ENERGIZING NATURE programmes, it includes the Freshness, Warmth, Vitality, Joy, Comfort and Power Nap programmes, as well as trainings and ENERGIZING tips.

The visualisation benefits from active ambient lighting and large screens with high-resolution animations. Passengers can join a programme in progress from their seat ("Join" mode) or suggest their own programme to other passengers ("Share" mode). The voice assistant "Hey Mercedes" is integrated. A statement such as "I am stressed", for example, automatically triggers the Joy programme with regenerative character. If the driver says "I'm tired", they are prompted to take a break and ENERGIZING COMFORT starts the Vitality programme.

The ENERGIZING COACH is based on an intelligent algorithm. It recommends the Freshness, Warmth, Vitality or Joy programme depending on the situation and individual. If the Mercedes-Benz vivoactive® 3 smartwatch, the Mercedes-Benz Venu® smartwatch or another compatible Garmin® wearable is linked, personal values such as stress level or sleep quality optimise the precision of the recommendation. Via the Mercedes me App, the smartwatch sends important vital data of the wearer to the ENERGIZING COACH, e.g. pulse rate, stress level and sleep quality. The recommended comfort programme can be started directly from the suggestion in the form of a notification in the MBUX system. The aim is to ensure that the driver feels well and relaxed even during demanding or monotonous journeys. In addition, the pulse rate recorded by the integrated Garmin® wearable is shown on the central display.

Two ENERGIZING packages are offered for the EQS SUV. The package contents:

- The ENERGIZING Package includes ENERGIZING COMFORT, ENERGIZING COACH and AIR-BALANCE Package.
- The ENERGIZING Package Plus also includes driver and front passenger seat climate control, steering wheel heating and the Front Multicontour Seat Package.

The whispering class for the ears

The new EQS SUV: quiet-running and vibration comfort

The EQS SUV is designed to meet the highest standards of quiet-running. The performance specifications therefore already defined a number of measures, including special acoustic foams in some of the profiles of the body shell as well as the encapsulation of the eATS at the front and rear. The drive units are doubly insulated using rubber mounts. Ramps in the underbody panelling reduce noise from chippings thrown up in the wheel arches.

Even the design of the electric powertrains (eATS) takes quiet-running and vibration comfort (NVH - Noise, Vibration, Harshness) into account. The magnets are arranged inside the rotors in an NVH-optimised way (known as 'lamination'). This also reduces the use of rare earths. The shape of the winding, what is known as the stator tilt, also supports vibration comfort, especially at low speeds. The coils in the stator are at an angle in relation to the permanent magnets of the rotor. This reduces the occurrence of what is known as detent torques. They would lead to slight but unpleasant vibrations when driving very slowly.

In addition, the cover of the inverter has a sandwich design of three metal and plastic layers. The eATS are double-decoupled from the body via elastomer bearings.

The 4MATIC versions are equipped with an innovative supporting frame at the front axle. What is known as injection bonding is used as the joining technique. This involves joining the four main components - forged aluminium parts and extruded profile - to form a component with optimised vibration characteristics.

Highly effective spring/mass components provide continuous sound insulation from the cross-member under the windscreen to the floor of the boot. Acoustic foams are inserted into many members during construction of the body shell.

In addition, the main floor is designed with beads for NVH reasons. These prevent resonance of the surface and thus the occurrence of a corresponding structure-borne sound. Ramps in the underbody panelling reduce noise from chippings thrown up in the wheel arches.

Two acoustic dividers in the very large tailgate reduce booming noises. These could be caused by roadway excitations and are favoured by the large volume of the cabin including the luggage compartment. As in all Mercedes-Benz estate cars and SUVs, the tailgate's catch is decoupled.

In addition, there are the aeroacoustics measures, more on this in the specific chapter.

With a view to the future

The new EQS SUV: Navigation with Electric Intelligence

When it comes to Navigation with Electric Intelligence, the name says it all. Because it plans the fastest and most convenient route, including charging stops, based on numerous factors and reacts dynamically to traffic jams or a change in driving style, for example. Navigation with Electric Intelligence is clever; it even calculates the expected charging costs for a charging stop. Furthermore, the customer can edit the planned routes individually by adding preferred charging stations along the route or excluding proposed charging stations.

While a conventional range calculator relies on past data, the Navigation with Electric Intelligence system looks to the future. The energy demand is computed for the calculation of the route. The topography, route, ambient temperature, speed, heating and cooling requirements are all taken into account. Further factors include the traffic situation along the planned route, as well as the available charging stations to be found there, their capacity and payment functions. Calculation takes place in the cloud and is combined with on-board data.

The customer does not necessarily always have to take on a full charge, but will be given a specific recommendation as to the required charging time at the charging station. The charging station stops are planned in the way that is most favourable for the overall travelling time: under certain circumstances, two short charging stops with a higher charging capacity can be more advantageous than charging once for a long time. In addition, Navigation with Electric Intelligence automatically adjusts the vehicle's charging settings and optimises them for fast charging along the route.

In the EQS SUV, MBUX also displays whether the available battery charge is sufficient to return to the starting point without charging.

Charging stations along the route that have been added manually are given preference in the route calculation. Proposed charging stations can be excluded. The estimated charging costs per charging stop are calculated.

If there is a risk of not reaching the destination or the charging station with the selected settings, Active Range Monitoring issues the prompt to activate ECO driving functions. In addition, the driving speed for reaching the next charging station or the destination is calculated and displayed in the speedometer. Under the menu item "Range", the driver can switch off various energy consumers to increase the range and activate the ECO driving functions to support a more efficient driving style.

How electricity gets into the car

The new EQS SUV: the charging functions

Three charging programmes are offered in the EQS SUV - Standard, Home and Work. In these, parameters such as departure time, air conditioning and maximum charge level can be preset. The Home and Work charging programmes can be activated based on location. This means that they are switched on automatically as soon as the vehicle is parked at a charging point at the positions stored in the system. The user is informed about this in MBUX.

The EQS SUV also has these intelligent charging functions:

- ECO Charging is a programme for preserving the battery. Various measures reduce the battery load during charging and slow down the natural ageing process of the battery. For example, the maximum charging capacity is reduced, a charging limit of 80 percent is observed and charging is delayed based on the set departure time.
- With the charging interruptions function, the customer can specify time periods during which the AC charging processes are paused. Electricity costs can be saved as a result, for example.
- In Japan, bidirectional charging will also be possible with the EQS SUV, i.e. charging in both directions. The CHAdeMO ("Charge de Move") charging standard there supports bidirectional charging. This is the prerequisite for the V2G (Vehicle-to-Grid) and V2H (Vehicle-to-Home) applications. This means that the EQS SUV can, for example, serve as a buffer for electricity from the domestic photovoltaic system or supply the household with energy in the event of a failure of the public mains.

The charging components of the EQS SUV

A latest-generation charging system sits above the rear axle of the EQS SUV. It can be used to charge the battery via the public mains with single-phase or three-phase alternating current and an optional charging capacity of up to 22 kW. In addition, intelligent wallboxes from national partners are available to customers in the individual markets. Mercedes-Benz also offers an installation service for these wallboxes. This includes a pre-check of the installation conditions, a detailed consultation and of course the installation.

A DC fast charging system with a charging capacity of up to 200 kW is fitted on board for (fast) direct current charging. High charging currents can be maintained for a long time through temperature and charging management. Power for up to another 250 kilometres (WLTP) is recharged in just 15 minutes.

The actual charging time depends on the current vehicle parameters, the available infrastructure and the country-specific vehicle equipment. The charging socket is located at the rear right of the vehicle and is designed according to market requirements:

- Europe and the USA will receive the CCS (Combined Charging System), which allows charging with direct and alternating current via the same connection.
- The vehicles intended for China (GB/T plug standard) on the other hand will have a separate charging socket for DC charging like Japan (CHAdeMO standard). A twin charging socket is used here; it combines the separate AC and DC charging sockets under one charging flap.

With the new Plug & Charge function, Mercedes me Charge customers can charge the EQS SUV particularly conveniently (for details, see the chapter on Mercedes me Charge).

Mercedes me Eco Coach: The personal trainer for environmentally friendly driving

The Eco Coach supports the use and optimisation of the vehicle on the basis of real data by providing helpful tips and explanations on sustainable and resource-saving use with regard to individual driving, charging and parking activities. This effort is rewarded with points that can be redeemed for attractive prizes at a later date. In addition, exciting challenges can be completed to raise the score further. The Eco Coach is integrated into the displays in the EQS SUV.

Tight-knit charging network and offset green electricity

The new EQS SUV: Mercedes me Charge[1]

Since 2021, Mercedes-Benz has ensured a subsequent offset with green electricity when customers use Mercedes me Charge to charge their cars in Europe. High-quality guarantees of origin ensure that as much green power from renewable energies is fed into the grid as is withdrawn via Mercedes me Charge. In the first year after the purchase of an EQS SUV, there is no basic fee for Mercedes me Charge L in Europe, and charging costs at IONITY stations are included for one year from service activation. The Plug & Charge function makes charging this model particularly convenient.

Public charging using Mercedes me Charge will soon become even simpler and more transparent: from June 2022 there will be new system of tariffs in Europe. In future, Mercedes me Charge will offer three new charging tariffs that are tailored to individual driving performance. Mercedes me Charge S for occasional chargers, Mercedes me Charge M for normal chargers and Mercedes me Charge L for frequent chargers. With the introduction of the new tariff system, customers will also have access to fixed prices that apply regardless of the operator. The basic fee for Mercedes me Charge L is included for EQS customers in the first year after service activation.

Mercedes me Charge is one of the largest charging networks worldwide: it currently comprises over 700,000 AC and DC charging points, including around 300,000 are in Europe. Among them are IONITY's fast charging stations, which will continue to be vigorously expanded over the next few years: As one of the shareholders of the European fast charging network IONITY, Mercedes-Benz is investing 700 million euros together with the other partners. This is expected to increase the number of IONITY charging stations across Europe from 400 to 1000 by 2025, bringing the total number of charging points from 1500 to around 7000.

Charging costs at IONITY stations are included for buyers of an EQS SUV for one year from service activation. The IONITY charging stations already offer only green electricity. Mercedes me Charge has significantly expanded this opportunity to further reduce the carbon footprint: with Mercedes me Charge, customers have been charging with offset 'green' electricity at all public charging stations across Europe since 2021. In addition, the functionality of Mercedes me Charge in MBUX will be expanded to include functions such as filtering and forecasting the availability of charging stations.

How Green Charging works: to promote the use of electricity from renewable energies, Mercedes-Benz uses guarantees of origin to make the charging process green. The quality of these guarantees of origin is defined by a green electricity label. This ensures that an equivalent amount of electricity from renewable resources is fed into the grid to compensate for the charging of an electric vehicle. Amounts of energy used for charging are thus offset with green power after the actual charging process, while also creating incentives to invest in renewable energy plants.

Plug & Charge – simpler and more convenient charging

With the Mercedes me Charge function Plug & Charge, the EQS SUV can be charged even more conveniently at Plug & Charge-enabled public charging points: when the charging cable is plugged in, the charging process starts automatically; no further authentication by the customer is required. The vehicle and the charging station communicate directly via the charging cable. In addition to being available at more than 1500 IONITY fast charging stations across Europe, Plug & Charge is now also available at the ultra-fast Aral pulse charging

[1] To use the Mercedes me connect service "Mercedes me Charge", a separate charging contract with a selected third-party provider is required. Charging processes are billed and paid via this service. A personal Mercedes me ID and agreement to the Terms of Use for the Mercedes me connect services are required for use of the Mercedes me connect services.

stations. In Germany alone, there are more than 500 ultra-fast pulse charging points, and the network is growing continually – including beyond Germany. Mercedes-Benz continues to work steadily on the rollout of Plug & Charge to further charging stations.

What is more, Mercedes me Charge customers continue to benefit from the integrated payment function with automatic payment. The customer chooses the preferred payment method only once. Every charging process is then automatically debited – including abroad. The individual charging processes are clearly listed in a monthly invoice.

Whether a charging station is Plug & Charge-enabled can be seen by viewing the charging station details on the display of the EQS SUV and the Mercedes me App. It is also possible to search for specific suitable charging stations. Plug & Charge is the fourth way to access charging points, alongside enablement via MBUX on the vehicle's media display, the Mercedes me App and the Mercedes me Charge card.

Mercedes me App: easy to use on smartphone and tablet

The Mercedes me App offers many useful functions. These include a filtering option that allows the charging points to be sorted according to criteria such as availability or charging capacity. How busy the respective charging station is expected to be during the course of the day is determined and displayed on the basis of a probability calculation. The "Navigation with Electric Intelligence" function suggests intelligent charging stops, calculates the total journey time and provides an estimate of the charging costs incurred in advance. For details, see the separate chapter.

Mercedes me Eco Coach: your personal trainer for more environmentally conscious driving

The Eco Coach supports the use of the EQS SUV on the basis of real data. It provides helpful tips and explanations on the sustainable and resource-saving use of the vehicle based on the individual driving, charging and parking activities. Those who take this to heart receive points. They can be redeemed for attractive prizes at a later date.In addition, users can complete exciting challenges to further raise their score. The Eco Coach is integrated into the display in the EQS SUV.

Sophisticated thermal concept and individual climate comfort in the rear as well

The new EQS SUV: climate control

The pre-entry climate control system is pleasant and efficient in its effect. The THERMATIC automatic climate control system with two climate zones is fitted as standard, while THERMOTRONIC with four (five-seater) and five (seven-seater) zones is available as an option. Sensitive sensor systems and intelligent recirculation controls are part of both.

The intelligent thermal management of the EQS SUV comprises several circuits:

- The powertrain cooling circuit is used to cool the electric powertrain, the DC/DC inverter and the charging components. The sophisticated thermal concept for high load capacity and multiple accelerations with consistently high performance also includes what is known as the water lance in the shaft of the electric motor's rotor. Other cooling elements in the cooling circuit are fins on the stator and the needle-shaped pin-fin structure on the inverter. The transmission oil cooler also brings more efficiency when driving in the cold: the transmission oil absorbs heat from the more quickly heated overall system and thus becomes thinner, which reduces friction.
- A heating circuit for the interior is coupled with the powertrain cooling circuit. As soon as the heating is on, the heat flows through the heater core (small heating circuit, electric heater). If waste heat is present in the powertrain, the system switches to the large circuit. Only if its heat is not sufficient, for example at particularly low outside temperatures, is additional heat generated via the high-voltage PTC booster heater (so-called register or series connection). Due to this efficient waste heat utilisation, additional heating is often no longer necessary in the frequent temperature range above 5°C.
- The high-voltage battery has its own cooling circuit with separate cooler and chiller (heat exchanger between cooling and refrigeration circuit). For the sake of extended durability, the battery is cooled with significantly colder coolant than the powertrain during normal operation. At very high outside temperatures, the coolant is cooled by a chiller connected in parallel to the radiator using the refrigerant from the air conditioning system. This option is mainly used for particularly high fast-charging capacities when the vehicle is stationary. A further high-voltage PTC booster heater is integrated into the battery circuit. It has the task of either heating the battery to a temperature level favourable for operation (at temperatures below minus 25°C) or heating it for possible fast charging (at temperatures below 10°C).
- The interior is cooled by a refrigerant circuit with electric compressor and evaporator. An air-cooled condenser in the cooling module is used for heat dissipation.

Pre-entry climate control: pleasant temperatures right from the start

The departure time and desired interior temperature can be selected in advance via Mercedes me, i.e. also remotely via app, or via the central display in the vehicle. Ideally, the EQS SUV is heated or cooled during a charging process so that the energy required for this comes from the mains and does not cost any range.

During preheating by the pre-entry climate control system, the seats are also heated in addition to the interior air - depending on the equipment. During pre-cooling, on the other hand, the electric air conditioning system switches on and thus lowers the interior temperature. Depending on the equipment, the seat ventilation is also activated.

Climate control systems: personal settings in the user profile

Individual climate comfort in the front seats is provided by the standard-fit THERMATIC automatic climate control system with two climate zones: driver and front passenger can set the temperature separately for their side and save it in user profiles. Thanks to the sensitive sensor system, the interior temperature is automatically kept constant - even in changing weather conditions and varying sunlight.

The integrated activated carbon-based interior air filter works very efficiently and can reduce pollen, pollutants and unpleasant odours in the incoming air in addition to dust and soot particles. The EQS SUV automatically switches to recirculation mode when the system detects a tunnel passage via GPS.

In addition to the comfort setting, the automatic climate control system also offers ECO and ECO+ operating modes. With ECO, the operation of the air conditioning is still possible without restrictions with reduced heating and cooling capacity. In ECO+ mode, only the fan and, if necessary, the waste heat from the eATS are used. The HV components compressor and heater, on the other hand, remain switched off. ECO and ECO+ reduce the energy consumption of the climate control functions, so minimising the impact on the vehicle's range.

The EQS SUV is available with THERMOTRONIC automatic climate control with four climate zones as special equipment. Here, the rear passengers in the second row of seats also enjoy a personal feel-good climate. They can adjust the settings on their own climate control panel. Another difference to the THERMATIC is the even more intelligent recirculation mode: a sensor for air quality and harmful gases continuously monitors the quality of the outside air drawn in and automatically switches to recirculation mode in the event of elevated pollutant levels.

Individually adjustable climate comfort, even for passengers in the third row of seats, is offered by the optional THERMOTRONIC automatic climate control system with five climate zones: Temperature and ventilation intensity can be regulated independently for five zones. In this way, all passengers enjoy their desired feel-good climate.

A HEPA filter (High Efficiency Particulate Air) is part of the special equipment ENERGIZING AIR CONTROL Plus. The HEPA (High Efficiency Particulate Air) filter has a very high filtration level that enables it to trap fine particles, microparticles, pollen and other substances that enter with the outside air. An activated charcoal coating reduces sulphur dioxide and nitrogen oxides as well as odours. For the details of ENERGIZING AIR CONTROL Plus with HEPA filter: see separate chapter.

Comfortable, dynamic and adaptable

The new EQS SUV: the suspension

The chassis of the new EQS SUV comprises a four-link axle at the front and an independent multi-link suspension at the rear. The AIRMATIC air suspension with continuously adjustable damping ADS+ is standard equipment. To increase ground clearance, the vehicle level can be raised by up to 25 millimetres. In addition to the DYNAMIC SELECT modes ECO, COMFORT, SPORT and INDIVIDUAL, the EQS SUV also features OFFROAD, a further mode for off-road driving. It can be used with or without ESP®. Also standard is rear-axle steering with a steering angle of up to 4.5 degrees for great manoeuvrability in town and agility over land.

The standard-fit AIRMATIC air suspension responds particularly sensitively. It combines air suspension bellows with adaptive ADS+ dampers whose characteristics can be varied at each individual wheel fully automatically, in both the compression and rebound stages. While driving, a sophisticated sensor system and algorithms set the dampers according to the quality of the road to ensure that, for example, driving over a bump with just one wheel is not transmitted to the entire axle and the interior. Spring and damper are combined in one strut on the front axle, but separate on the rear axle.

This level control is part of AIRMATIC. It keeps the ground clearance constant irrespective of the vehicle load, but also makes changes when needed. To increase ground clearance, the vehicle level can be raised by up to 25 millimetres. This is possible up to a speed of 80 km/h. The body can be raised by 25 mm at the touch of a button below 60 km/h, above 70 km/h it is automatically lowered back to normal level. Furthermore, in the COMFORT and SPORT modes, the body is automatically lowered by 10 and 15 mm, respectively, at speeds above 110 km/h to reduce drag and increase driving stability. If the vehicle drops below 80 km/h, the body level returns to the initial position.

Manoeuvrable: both axles can do the steering

The standard rear-axle steering with a steering angle of up to 4.5 degrees contributes to the manoeuvrable and dynamic impression of the EQS. Alternatively, the rear wheels can even turn in by up to 10 degrees. This allows a turning circle of 11.0 instead of 11.9 metres, which corresponds to the turning circle of many lower mid-range models. The variant with the large steering angle can still be activated after delivery via an upgrade over the air (OTA). The respective rear-axle angles and trajectories are shown in the driving mode menu on the central display.

The interaction between the front-axle and rear axle-steering is configured to ensure agile responsiveness in urban and country traffic with little steering effort. At the same time, it also achieves a very high level of stability. This results in e.g. small side-slip angles and a high level of yaw suppression. At high speeds, the focus is more on stability, though without compromising precision and responsiveness. This added value is achieved by the integrated actuation of steering and brakes (ESP®), and considerably improves driving safety as a result.

The operating principle of the rear-axle steering in detail: An electric motor drives a spindle at the rear axle via a drive belt. This makes axial adjustments to the spindle. Depending on the speed (below/above 50 km/h) and the steering angle, the rear wheels turn in the same or the opposite direction as the front wheels (same direction or counter-direction). In simplified terms, this results in greater agility and a smaller turning circle by counter-steering and more stability with same-direction steering. The environmental data of the vehicle sensors (radar, camera, ultrasonic) are used to adapt the maximum angle to the relevant situation. The system switches from counter-direction to same-direction steering at more than 50 km/h.

DYNAMIC SELECT: with OFFROAD driving mode

The driver can change the characteristics of the drive, ESP®, suspension and steering using DYNAMIC SELECT. In addition to ECO, COMFORT, SPORT and INDIVIDUAL, the 4MATIC versions of the EQS SUV feature OFFROAD, a further mode for off-road driving. Overall, the accelerator pedal curve is much flatter there. The vehicle level is raised by 25 mm. At speeds above 80 km/h, the vehicle lowers to normal level. If the speed falls below 50 km/h, the vehicle is raised again. Two versions of the OFFROAD driving mode with and without ESP® can be selected:

In the OFFROAD driving mode with activated ESP®, little slip is permitted on the potentially spinning wheels. In this way, significantly fewer tracks are left behind on a wet meadow, for example. This is achieved through torque balancing between eATS and ESP®. The pressure in the control system thus matches the torque at the wheel exactly. When articulated in the terrain, a kind of pre-filling takes place. This means that the unloaded wheel is already supplied with pressure in the wheel brake during the rebound phase in order to prevent it from spinning.

The aim of the OFFROAD driving mode with ESP® OFF is to allow sufficient slip, but still make the vehicle safe and easy to control. A lot of wheel slip, for example, is helpful to have enough propulsion on sand - the vehicle burrows forward. The control thresholds of the ASR traction control system are significantly widened here. Even in potentially critical situations, such as turning around on a dune, when the momentum is not enough to reach the top, the driver always has full torque available. Power is sufficiently available from the eATS.

The off-road ABS works with significantly more slip. The slip is reduced via the steering angle so that the vehicle remains steerable. Downhill Speed Regulation (DRS) is now realised via the iBooster and not via a hydraulic unit (ESP®) as the models with combustion engine. As a result, DRS now controls much more quietly and even more smoothly.

The default setting is the COMFORT driving mode. The selection is acknowledged by acoustic and visual feedback. The desired driving mode is shown as the status and depicted on the central display.

More safety and less stress

The new EQS SUV: the driving assistance systems

Four modular equipment packages allow the EQS SUV to be configured entirely according to personal preferences. The driving assistance systems are also bundled accordingly. For example, the standard Advanced Package includes the Assistance Package. Those who opt for the Advanced Plus, Premium or Premium Plus Package get the Driving Assistance Package Plus.

The Assistance Package includes these three driving assistance systems:

Active Distance Assist DISTRONIC

On all types of roads – motorways, country roads or in town – this intelligent system can automatically maintain a preset distance from vehicles ahead. Special features:

- Selection of the DISTRONIC dynamics in MBUX, depending on DYNAMIC SELECT
- Adjustment of set speed and acceleration for maximum range
- With Navigation with Electric Intelligence (see separate chapter) and activated route guidance, the charging status at the destination or also at the intermediate charging point can be specified, if desired. Active Distance Assist DISTRONIC then adjusts the acceleration behaviour and, if necessary, the cruising speed to meet this specification.

Blind Spot Assist and exit warning function

Blind Spot Assist can warn the driver visually and, when the direction indicator is operated, also acoustically of lateral collisions if other road users are in the blind spot during the drive or when exiting the vehicle after the drive. With the exit warning, Blind Spot Assist continues to monitor the vehicle's surroundings for approx. three minutes after the vehicle is parked and warns of approaching vehicles, including two-wheelers.

Active Lane Keeping Assist

In a range from 60 to 250 km/h, Active Lane Keeping Assist uses a camera to detect when lanes markings or edges of roads are crossed, helping the driver to avoid leaving the lane unintentionally. The system also intervenes if there is a danger of collision with detected road users in the adjacent lane, e.g. with overtaking or oncoming vehicles. Special features:

- Reaction to detected edges of roads, e.g. a grass verge
- Particularly intuitive steering intervention
- Adjustment of sensitivity via a menu (Early, Medium, Late)
- The addition of Active Ambient Lighting, DIGITAL LIGHT and the Augmented Reality Head-up Display to the hazard warning system

In addition to Active Distance Assist DISTRONIC[1], the Driving Assistance Package Plus includes these driving assistance systems:

Active Steering Assist
This helps the driver to stay in lane at speeds up to 210 km/h. Special features:

- Lane detection at low speeds additionally with 360° camera
- Significantly improved availability and performance on bends on country roads
- Improved lane centring on motorways
- Situation-specific off-centred driving (e.g. forming an emergency corridor, but also following the road edge on country roads with no centre marking)

Evasive Steering Assist
Evasive Steering Assist can assist the driver when seeking to avoid another road user detected by the system in a critical situation. In the new EQS SUV, in addition to standing and crossing pedestrians, vehicles, pedestrians and cyclists moving in a longitudinal direction are also taken into account. The speed range is up to 110 km/h, support is also provided on inter-urban routes.

Active Blind Spot Assist and exit warning function
Active Blind Spot Assist can give a visual warning - and if the indicators are operated also an audible warning - of potential lateral collisions in a speed range from around 10 to 200 km/h. If the driver ignores the warnings and still tries to change lanes, the system can take corrective action by one-sided braking intervention at the last moment at speeds over 30 km/h. When the vehicle is stationary, the exit warning function can warn against exiting because a vehicle (or even a bicycle) is passing within the critical area. This function is available at standstill and up to three minutes after the start switch has been turned off. In addition, the hazard warning is supplemented with the aid of Active Ambient Lighting (also with the vehicle exit warning). Thanks to the cameras of the MBUX Interior Assistant, a danger warning can be given even if the driver or front passenger merely moves a hand towards the door handle.

Active Brake Assist with cross-traffic function
Active Brake Assist uses the on-board sensors to register whether there is a risk of collision with vehicles travelling ahead, crossing or oncoming. The system can give the driver a visual and audible warning if a collision is imminent. If the driver's braking response is too weak, the system can also assist by increasing the brake pressure as the situation demands, and also initiate autonomous emergency braking if the driver fails to respond. Special features are the turning manoeuvre function when starting off (including crossing pedestrians when turning), the cross-traffic function on inter-urban routes (up to 120 km/h) and the warning and braking for oncoming traffic.

[1] Compared with the Assistance Package, here additionally with anticipatory speed adjustment to speed limits, reaction to stationary vehicles that are in the lane at a vehicle speed of up to 100 km/h, as well as with an adjustment of the set speed at rest areas to 50 km/h.

Easy entry into smaller parking spaces and narrow entrances

The new EQS SUV: the parking assistants

The EQS SUV comes with the Parking Package with reversing camera as standard. Thanks to powerful sensors that monitor the vehicle's surroundings, the parking systems can help the driver with manoeuvring in many areas. The integration of Parking Assist in MBUX makes operation intuitive and fast. In conjunction with the Driving Assistance Package, emergency braking functions offer special protection for other road users.

Here are three particularly innovative parking systems:

With **Remote Parking Assist**, the driver can manoeuvre the vehicle into and out of parking spaces from close by using a smartphone. This means more comfort when getting in and out, and protects against damage when opening the doors. With the latest generation of Remote Parking Assist, many parking manoeuvres are possible. The driver monitors the parking process. Manoeuvring is automatic as long as the driver keeps the touch surface on the smartphone pressed and tilts it by 90 degrees. Otherwise, the vehicle is automatically braked to a standstill.

Memory Parking Assist (SAE level 2) can remember parking locations such as how to get to and from the garage at home. The driver sits behind the steering wheel and is asked whether they would like to carry out an automated parking procedure after the training process has been completed. If obstacles are detected, the system stops until they are removed.

With the pre-installation for the **INTELLIGENT PARK PILOT**[1], the EQS SUV is ready for Automated Valet Parking (AVP, SAE level 4). In conjunction with the necessary special equipment and the relevant Mercedes me connect service (country-specific), the vehicle has the requisite technical features on board to allow it to manoeuvre into and out of parking spaces in multi-storey car parks equipped with AVP infrastructure in fully automated mode and without a driver, as long as the corresponding Mercedes me connect service for the particular variant of the EQS SUV is available and has been booked, and the national legislation permits such operation.

But the other parking systems also support the driver in a variety of ways. Did you know that..

... **Active Parking Assist** also uses the rear axle steering and can thus enter the parking space with even greater agility? The calculation of the lanes (trajectories) is matched to this. And when things get really tight, it can make up to 12 moves. The parking process is completed at the latest when the vehicle is at an angle of 100 degrees to the start position. Acceleration, steering, braking, gear changes and turn indicators are controlled automatically. The driver remains responsible and has the possibility to intervene at any time and correct or complete the parking manoeuvre.

... when driving past recognised parking spaces, a press of a button on the MBUX display is sufficient to start the parking process? This is what is known as the **Quick Park function of** Active Parking Assist.

1 This function is currently not yet available to use. Use of the INTELLIGENT PARK PILOT will become possible in the future, once national legislation is in place to allow operation of Automated Valet Parking (AVP), multi-storey car parks are equipped with the necessary infrastructure, and the corresponding Mercedes me connect service for the particular variant of the EQS SUV is available and has been booked.

… **Drive Away Assist** can warn the driver if a collision with detected objects could occur when starting off due to a mix-up of accelerator and brake pedal or a wrong gear? At the same time, the speed is briefly limited in such cases if the danger of collision is detected.

… the **Parking Package with 360° camera** fuses the information from many sensors and cameras? This will allow more parking spaces to be identified and offered for automated parking, including spaces demarcated by lines (rather than vehicles). A total of 12 ultrasound sensors at the front and rear, a reversing camera in the tailgate and three further cameras in the exterior mirrors and at the front all work together.

… with the Parking Package with 360° camera, a real-time rendered vehicle model shows the status such as indicating or braking? It even visualises obstructions in the field of vision, e.g. open doors

… collision protection has been further extended to cross traffic? If the sensors detect other vehicles crossing during forward or reverse travel, the driver is first warned visually and audibly. The rear collision protection goes even further: if the driver does not react and the detected danger persists, the vehicle initiates autonomous emergency braking. The function, which is dependent on equipment, is called **Rear Cross-Traffic Alert**.

… Active Parking Assist in the EQS SUV also visualises the distance to obstacles from the driver's perspective with the help of the **Active Ambient Lighting**? As before, the distance is also conveyed acoustically and displayed on the screen.

Designed for many eventualities

The new EQS SUV: passive safety

The principles of Integral Safety apply regardless of the type of drive system. Like all other Mercedes-Benz models, the EQS SUV therefore has a rigid passenger cell, special deformation zones and modern restraint systems. The European version of the EQS SUV is the first Mercedes-Benz model to be able to detect whether rear seats are actually occupied. If a passenger in the rear is not wearing a seat belt, the driver receives a specific warning. Another new feature at Mercedes-Benz is what is known as the occupant presence reminder. This system can indicate children who may have been overlooked in the rear of the vehicle. In vehicles for Europe, Australia and New Zealand, the reminder is on board as standard, and a similar system is used in the USA.

The fact that the EQS SUV is based on an all-electric architecture also opened up new design possibilities for its safety concept. This made it possible to choose a favourable location for the battery in a crash-protected area in the underbody (for details on the safety of the high-voltage system including the battery, see separate chapter). And because there is no large engine block on board, the behaviour in a frontal crash could be modelled even better. In addition to the standard crash tests, the car's performance in various additional load situations was verified and extensive component tests carried out at the Vehicle Safety Technology Centre (TFS). The particular focal points in a large SUV include partner protection and roof strength.

Safety structure: Accident protection is not a question of the powertrain concept

The body shell of the EQS SUV is largely made of different types of steel. Reinforcements made of high-strength steel are used in the main floor. Press-hardened steel reinforcements are intelligently integrated in the body shell structure and combined with high-strength, hot-formed steel components. The hot-formed steels in the A and D pillars are partially annealed in the flange areas, i.e. they feature special thermal aftertreatment there. In the event of a crash, this can prevent the formation of cracks. This is how the strict Mercedes-Benz crash requirements are achieved.

Frontal impact

To ensure that the front end of the EQS SUV absorbs the energy as evenly as possible, a large cross member connects the two longitudinal members. As in every Mercedes-Benz, the cross connection not only serves as self-protection, but is also a key component for the protection of other road users. Deformable crash boxes are attached to the cross members, which enhances the ease of repair in the event of minor damage.

In a severe frontal impact, two longitudinal members made of high-strength steel absorb the main energy. A supporting role is played by an upper load path on the shock-absorber strut and a lower load path along the integral carrier. The integral carrier made of steel not only accommodates the eATS and axle components, but it also plays a key role in the event of a crash. In case of severe deformations, the wheels form an additional load path, whereby they move towards the rear and are braced against the sill and/or sidewall. The geometry and strength of the sills have been designed for this accordingly. Honeycomb deformation elements are installed between the integral support and the battery housing, which can limit the force on the battery housing. The battery housing itself is extremely rigid and allows for relatively little deformation, so that the cells inside are not damaged. Reinforcing structural components have been additionally integrated into the front area of the underbody with minimal overlap for the load case.

Side impact

In principle, in a side impact only a very small deformation path is available. Highly stable structures in the EQS SUV therefore serve to protect the occupants, but also the battery. Alongside the doors with their reinforcements, the sidewall structure also comprises the pillars, the side roof frame and the side members/sills. Cross reinforcements in the underbody as well as the very rigid battery housing contribute to

the high stability in a side impact. The sills are made of steel and have a monocoque design with an inserted aluminium profile. For a side impact, the sills are specifically designed to be deformable in order to avoid critical damage to battery modules as far as possible.

Rear impact

The EQS SUV is also steeled against rear impacts. As with the front-end assembly, a cross-member with bolted-on crash boxes helps to distribute the impact energy from a one-sided load to both longitudinal members. Thanks to the specific design of the structural components and the rear axle carrier, the requirements on battery safety have been fulfilled.

Rollover

In the event of a rollover, it is particularly important that sufficient headroom is maintained and measures are taken to prevent heads from swinging out. At Mercedes-Benz, strict survival space requirements apply worldwide as part of its Real-Life Safety philosophy. These were validated in the EQS SUV by roof drop tests and roof compression tests. This means that even the stringent requirements of both the IIHS (Insurance Institute for Highway Safety) and the American legislator for roof compression resistance can be met. In these tests, a pressure plate is applied to the roof structure on the A-pillar above the windscreen on the driver's side (IIHS only) and then on the passenger's side. The vehicle roof must withstand a compressive force that can reach up to four times the vehicle weight.

High-voltage system: automatic shutoff in the event of serious accidents

The battery, high-voltage (HV) cables and other HV components have been designed and protected in such a way that they meet Mercedes-Benz's high safety requirements in the event of an accident. More on this in the chapter "High-voltage safety".

The multi-stage protection concept of the high-voltage (HV) system has already proven itself in the other Mercedes-EQ models. In case of danger, it can be automatically switched off and disconnected from the battery. A distinction is made between a reversible and an irreversible shutoff. A reversible shutoff can take place in the event of minor frontal collisions. Afterwards, it is possible to reconnect the high-voltage system by pressing the start button again. Thus, if the vehicle does not detect a fault during the system check with insulation measurement initiated by this, the EQS remains manoeuvrable. Only in the event of severe frontal collisions, in which the vehicle is usually no longer drivable anyway, is the high-voltage system irreversibly switched off. It can no longer be activated without repair. This also applies to collisions from the side and in rollovers when the threshold of the restraint systems is reached. In the event of a rear-end collision, the HV system is also irreversibly switched off above a certain accident severity. When shutting down, there is a provision to ensure that within a few seconds there is no residual voltage in the high-voltage system outside the battery that could cause injury.

In addition, disconnection points are also provided for the rescue forces, where they can deactivate the high-voltage system themselves.

A special feature is that the sensor system of the airbag control unit remains active even during the charging process. If an impact of a certain severity is detected while the vehicle is connected to a charging station, the EQS SUV automatically interrupts the charging process.

Acoustic presence indicator: special sound as a warning for pedestrians

The acoustic presence indicator (standard) is an artificially generated vehicle noise. This makes it easier for pedestrians to perceive the EQS SUV at low speeds. One sound generator sits weatherproof in the front right wheel arch and one in the rear underbody. An EQ-specific sound is generated up to a vehicle speed of approx. 30 km/h. Initially it becomes louder and higher with increasing speed. This change allows conclusions to be drawn about the driving status (braking/acceleration).

Above 20 km/h, the sound is then already gradually reduced, since the vehicle can then be perceived by its tyre and wind noise. If the speed drops from a higher speed back down to 30 km/h, the sound is faded in again. When reversing, an intuitively recognisable interval tone sounds regardless of the speed.

Sophisticated restraint systems

In addition to driver and front passenger airbags, a knee airbag on the driver's side is also standard. It protects the legs from contact with the steering column or instrument panel in a severe frontal crash. This can prevent or mitigate the severity of injuries.

The standard window airbags can reduce the risk of head impact with the side window or penetrating objects. In the event of a serious side-on collision, the window airbag on the side of the impact extends from the A- to the C-pillar like a curtain over the front and rear side windows. If a rollover is detected, the window airbags can be activated on both sides. For the EQS SUV, Mercedes-Benz has developed two versions of the window airbag with different lengths for five- and seven-seaters. This means that the third row of seats also has a side head protection system.

To meet new rating requirements, vehicles for Europe are also equipped with a centre airbag. During a severe side impact, it positions itself between the driver and front passenger seat, reducing the risk of their heads making contact. It is integrated into the driver's seat backrest in the centre of the vehicle.

Pyrotechnic belt tensioners and force limiters are standard on all outboard seats, including the second and third rows. There are optional side airbags for the second row of seats. They cover the chest area of the occupants in the outer rear seats in the event of a severe side impact and supplement the protection provided by the standard window airbags.

In conjunction with the Exclusive Nappa Leather Package, illuminated design belt buckles are on board. They support buckling up because the belt buckles are easier to find thanks to pulsating lighting. When stationary and at low speed, the lights are solid.

The EQS SUV has i-Size child seat attachments as standard on the two outer seats in the second row. With two anchors each between the seat backrest and the seat cushion, corresponding child seats are installed particularly quickly and securely. Top tether attachment points behind the rear head restraints provide additional support.

Warnings: if the belt is not worn and children are forgotten

As the first model from Mercedes-Benz, the European version of the EQS SUV no longer just has a seat belt status indicator for the rear, but a more elaborate seat belt warning system. It warns when the seat is occupied and the seat belt is not fastened, thus providing even more effective protection against unbelted passengers. For this purpose, there are also special mats in the seats of the second row and, where applicable, of the third row. They can tell whether passengers are seated.

Mercedes-Benz pursues the goal of ensuring that children ideally are not forgotten in the vehicle. The occupant presence reminder can help to point out children who may have been overlooked in the rear of the vehicle. It activates and deactivates automatically if by a rear door being open for a longer period it can be assumed that small children could get in or out.

When the vehicle is switched off, the driver first receives the text message "Do not leave persons or animals behind" on the driver's display if the system has previously activated automatically. The driver can switch off the system until the next vehicle start by confirming the corresponding message on the display. An indicator light shows the status of the system.

If the vehicle is locked from the outside without the rear passengers having had sufficient time to get out, a warning sequence can be issued if the system is activated.

- The hazard warning lights are switched on for approx. three seconds
- The horn emits an acoustic signal for approx. three seconds
- A clear message appears on the central display for several minutes

The system does not warn should after switching off the EQS SUV at least one of the rear doors be open long enough that a person might get out.

PRE-SAFE® system precautionary protection as standard
The PRE-SAFE® preventive occupant protection system is fitted as standard in the EQS SUV. It uses the time before an impending accident to prepare for the accident in the best possible way with a variety of measures. The aim is to reduce any loads that occur. For example, the electrically powered, reversible seatbelt tensioner on the front seats can significantly reduce forward displacement in the event of emergency braking. In certain situations, the side windows or panoramic sunroof close automatically. In addition, the front passenger seat can be moved into a more favourable position in the event of a crash. In addition, PRE-SAFE® Sound can precondition the hearing and reduce the effects of the accident noise on the hearing. In sum, the components of the PRE-SAFE® system can significantly reduce the risk of injury.

In conjunction with the Driving Assistance Package Plus or the Driving Assistance Package with DRIVE PILOT, PRE-SAFE® Plus and PRE-SAFE® Impulse Side are also on board. PRE-SAFE® Plus can take action in the event of an imminent rear-end impact.

As only a limited crumple zone is available in a side impact, PRE-SAFE® Impulse Side (availability depending on selected equipment) can move the affected driver or front passenger away from the danger even before the crash as soon as the system detects that a side-on collision is immediately imminent. For this purpose, air chambers in the side bolsters of the front seat backrest are inflated in fractions of a second.

High level of protection against high voltages

The new EQS SUV: high-voltage safety

To avoid electric shocks and high-energy short circuits, Mercedes-Benz has developed a multi-stage high-voltage safety concept comprising seven key elements. In addition to the battery, all components with a voltage level higher than 48 volts are part of the high-voltage system. The protection concept provides a high degree of safety when driving, both during and after a crash.

- Separate positive and negative lines
  A conventional 12 V on-board electrical system uses the vehicle body as a negative terminal ("earth"). The high-voltage (HV) system, on the other hand, is fully insulated from the vehicle structure: all HV components are connected to each other with both a positive and a negative line. The HV lines can be identified by means of their orange sheathing. Even if damage should occur, there is no immediate danger of an electric shock or short circuit, as even in this case there is no closed circuit.

- HV system self-test
  The entire HV system, in particular the battery, continually monitors itself. Continuous temperature, insulation and short-circuit measurements detect and indicate fault currents at an early stage. What is known as an interlock switching circuit incorporates all of the HV components and monitors whether all of the components are connected correctly. Faults in the system are displayed and if there is any doubt, the HV system cannot be started, or is even automatically switched off.

- Protection zones
  Based on more than 50 years of accident research by Mercedes-Benz involving thousands of investigated accidents, a protection zone concept has been specially developed for electric vehicles. As part of this, the vehicle is divided into three areas.

    - Outer zone: in case of minor damage, the HV system is mostly unaffected and therefore does not need to be automatically switched off. That is because the high-voltage components are either located outside of the area affected by such minor damage or are safeguarded by additional measures (see 4. Inherent stability).
    - Inner zone: if the vehicle is affected by more severe accident damage, the HV system is automatically switched off (see also point 6): in an accident of such severity, the airbags are generally deployed. Depending on the direction of force in the accident and the severity, the HV system is switched off reversibly or irreversibly (great accident severity in the case of frontal, side or rear impact, rollover). Either the customer can therefore switch it back on again, or activation is only possible again after replacing parts.
    - Core zone: in the third vehicle area, usually no or only slight deformation occurs in crash tests. This protection area is suitable for accommodating the HV battery or particularly sensitive components, for example.

- Inherent stability
  In the case of HV components in the outer deformation areas, rigid housings in particular make a contribution towards protecting components. For this, damage patterns and load levels are derived from crash simulations and crash tests during vehicle development. Affected HV components must also be protected against contact after the crash. The requirements are particularly high for the mechanical properties of the HV batteries. Here, in addition to standard crash tests, further load cases are also used to provide even further cover of actual accident conditions.

- Reinforcement measures
  All HV components are connected to each other with HV lines. HV cables are flexible lines which in some cases can also be routed inside structural areas. Although these are usually two separate cables anyway, they are additionally sheathed at particularly sensitive points to prevent loss of insulation in the event of crushing. In addition to the inherent stability, the protection level of other HV components can also be further increased, for example through specifically glance-off surfaces or protective shields.

- Automatic crash shutoff of the HV system
  As soon as a specific accident severity is detected in an impact, the HV system is switched off. As part of this, relays are opened in the HV battery which prevent further power from being fed into the HV system. Components which are connected to the battery are discharged in just a few seconds so that only a non-critical voltage level remains present. A distinction is made between a reversible and an irreversible shutoff. A reversible shutoff can take place in the event of minor frontal collisions. Afterwards, it is possible to reconnect the high-voltage system by pressing the start button again. This means that if the vehicle does not detect a fault during the insulation measurement initiated as a result, the EQS SUV remains manoeuvrable. Only in the event of severe frontal collisions, in which the vehicle is usually no longer drivable anyway, is the high-voltage system irreversibly switched off. It can no longer be activated without repair. This also applies to collisions from the side and in rollovers when the threshold of the restraint systems is reached. In the event of a rear-end collision, the HV system is also irreversibly switched off above a certain accident severity. When shutting down, there is a provision to ensure that within a few seconds there is no residual voltage in the high-voltage system outside the battery that could cause injury. A particular highlight is the "stationary crash detection": Even when switched off during charging, the EQS SUV can detect a severe impact and quickly interrupt the charging process. This helps to achieve a particularly high level of protection for the high-voltage system.

- Manual shut-off option for emergency services
  For the emergency services the vehicles feature additional shut-off options for the HV system, so-called rescue separation points. The installation locations are recorded in the rescue data sheets. For towing away, too, for example, a manual shutoff is useful when the vehicle is only slightly damaged and it cannot be clearly determined whether an automatic crash shutoff has occurred.