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The Audi e-tron quattro concept

The equipment, data and prices specified in this document refer to the model range offered in Germany. Subject to change without notice; errors and omissions excepted.

Summary:

The Audi e-tron quattro concept: Electric driving pleasure with no compromises

- **A foretaste of the production version: The electric-powered Audi e-tron quattro concept**
- **Range of more than 500 kilometers (*310.7 mi*) for full everyday usability**
- **New concept combines aerodynamics and creative design solutions**

Flow-enhanced design with a drag coefficient of 0.25; a powerful, all-electric e-tron quattro drive with up to 370 kW – Audi is presenting the Audi e-tron quattro concept at the International Motor Show (IAA) 2015 in Frankfurt. The car is the company's statement about the future of electric mobility: It is sporty, efficient and suitable for everyday use.

"Audi will present an all-electric, luxury-class sport SUV in early 2018. The Audi e-tron quattro concept provides a concrete foretaste of this," says Prof. Dr. Ulrich Hackenberg, Member of the Audi Board of Management for Technical Development. "It combines driving pleasure with great range, an expressive design and excellent comfort."

Electric power

The Audi e-tron quattro concept uses the power of three electric motors: One electric motor drives the front axle, the two others act on the rear axle. Total output is 320 kW. The driver can even mobilize 370 kW and over 800 Nm (*590.0 lb-ft*) of torque temporarily while boosting. The concept study thus performs like a sports car. When the driver floors the right pedal, the Audi e-tron quattro concept sprints from a standstill to 100 km/h (*62.1 mph*) in 4.6 seconds and quickly reaches the electronically governed top speed of 210 km/h (*130.5 mph*).

The concept with three electric motors which Audi is presenting for the first time makes the technology study an e-tron quattro. An intelligent drive management system controls the interplay between them as appropriate for the situation. The focus here is on the greatest possible efficiency. The driver decides on the degree of recuperation, the driving program S or D and the mode of the Audi drive select system.

During sporty driving on a winding road, the Torque Control Manager actively distributes the power between the rear wheels as necessary. This torque vectoring provides for maximum dynamics and stability.

The large lithium-ion battery is integrated into the floor of the passenger compartment. It gives the Audi e-tron quattro concept a balanced axle load distribution and a low center of gravity – prerequisites for its dynamic handling. The battery's capacity of 95 kWh enables a range of more than 500 kilometers (*310.7 mi*). The Combined Charging System (CCS) enables charging with DC or AC electrical current. A full charge with DC electrical current at a charging column with an output of 150 kW takes just around 50 minutes. As an alternative, the study is equipped with Audi Wireless Charging technology for contactless induction charging. The charging process is very convenient. The Audi e-tron quattro concept uses a system for piloted parking that guides it to the proper position at the charging plate. In addition, a large solar roof provides electricity for the drive system battery on sunny days.

The chassis also expresses the high-tech character of the concept study. The adaptive air suspension sport, which features controlled damping, lowers the body at higher speeds to reduce drag. The dynamic-all-wheel steering combines a dynamic steering system on the front axle with a steering system for the rear wheels. Depending on speed and the driving situation, they steer either opposite or in the same direction as the front wheels. The Audi e-tron quattro concept thus reacts even more spontaneously and stably, and is also very manoeuvrable at low speeds.

Aerodynamic: The exterior design

The Audi e-tron quattro concept harmoniously combines the design with the aerodynamics and all-electric drive system. The five-door technology study is 4.88 meters *(16.0 ft)* long, 1.93 meters *(6.3 ft)* wide and just 1.54 meters *(5.1 ft)* high. Its coupe-like silhouette with the extremely flat greenhouse that tapers strongly toward the rear lends it a very dynamic appearance. The car's drag coefficient measures just 0.25 – a new best for the SUV segment, where figures are usually considerably over 0.30.

All of this contributes considerably to the long range of more than 500 kilometers (*310.7 miles*). At speeds from 80 km/h (49.7 mi), electrically actuated aerodynamic elements on the engine hood, the flanks and at the rear end direct the flow of air as needed to improve the flow through and around the vehicle. This is one example of the intensive development work in the wind tunnel.

Wind noise is low on board the car, and there are no engine noises in an electric car in any case. The fascination of electric driving unfolds in near total silence.

The vertical separating edges on the side panels and the fully enclosed floor pan with its newly designed microstructures contribute to reducing drag. Cameras replace the exterior mirrors – another contribution to the excellent aerodynamics and also a foretaste of the future of driving.

All the main lighting functions at the front of the car use Matrix laser technology. The bottom section houses a new, distinctive lighting signature comprising five lighting elements. Each of these combines an LED luminary with an extremely flat OLED element (organic light-emitting diode). Audi is developing Matrix OLED technology for use in production vehicles and is showing it for the first time in the concept study at the IAA.

The rear lights also comprise two sections. Each of the top zones features nine red OLED units for the tail light function, with three more below.

Deep integration: The interior

The package of the Audi e-tron quattro concept enables a spacious, comfortable interior for four persons and 615 liters (*21.7 cu ft*) of luggage. The interior has a light and open feel to it; its architecture melds harmoniously with the operating and display concept. All displays in the interior use OLED technology. The extremely thin films can be cut to any desired shape.

The new Audi virtual cockpit curved OLED is a further development of the Audi virtual cockpit that debuted in production vehicles in 2014. To the left and right below the fully-digital instrument cluster are two touch displays with black glass and a subtle aluminum frame. The driver controls the lights and the systems for piloted driving with the left display. The large display on the right is for media and navigation management. The steering wheel serves as an alternate control level. Its spokes are equipped with contoured touch surfaces.

Below the selector lever on the center tunnel console are two more OLED displays for the drive system status, climate control and freely programmable information functions. The curved displays in the front section of the doors serve as digital exterior mirrors.

The two rear passengers sit on comfortable individual seats. They can use the OLED displays on the center console to configure the climate control and infotainment for their area or to exchange data with the driver. An LTE module connects the Audi e-tron quattro concept with the Internet. The connectivity features in the study are cutting edge.

The zFAS: Nerve center for piloted driving

The concept study is equipped with all the technologies that Audi has developed for piloted driving: radar sensors, a video camera, ultrasonic sensors and a laser scanner. The data these supply come together in the central driver assistance controller (zFAS) in the luggage compartment. It computes a complete model of the car’s surroundings in real time and makes this information available to all assistance systems and the systems for piloted driving. These technologies are also nearly ready for use in production vehicles.

At a glance

The Audi e-tron quattro concept

Technical equipment

- All-electric drive with a near-production body as an e-tron quattro: based on the MLB evo; three electric motors, one on the front axle, two on the rear axle with dynamic torque vectoring
- Total output while boosting 370 kW, total torque more than 800 Nm (*590.0 lbft*)
- 0 to 100 km/h (*62.1 mph*) in just 4.6 seconds, electronically governed top speed of 210 km/h (*130.5 mph*)
- Intelligent control strategy for the interplay of the electric motors, various recuperation levels
- Lithium-ion battery in the floor between the axles, 95 kWh capacity for a range of more than 500 kilometers (*310.7 mi*) on a full charge
- Charging possible with AC and DC electrical current
- Very convenient charging thanks to Audi Wireless Charging (AWC) and piloted parking
- Chassis with adaptive air suspension and dynamic-all-wheel steering
- Technologies for piloted driving, central driver assistance controller (zFAS)

Aerodynamics and design

- SUV with sporty, coupe-like lines, low greenhouse, tapered rear end with aerodynamic separating edges
- 4.88 meters (*16.0 ft*) long, 1.93 meters (*6.3 ft)* wide and just 1.54 meters (*5.1 ft*) high, five doors
- Excellent air flow: cd value only 0.25, top-level aeroacoustics
- New aerodynamics concept combines technical measures for reducing aerodynamic drag with creative design solutions
- Examples include aerodynamic details such as the moving elements at the front, sides and rear; camera technology instead of conventional exterior mirrors; and a fully enclosed floor pan with microstructures
- Matrix laser technology headlights
- New e-tron design with OLED lighting elements at the front and rear
- Roof with solar cells, saves electricity direct to the battery

Interior

- Room for four adults, 615-liter (*21.7 cu ft*) luggage compartment
- Progressive interior design, fusion with OLED operating and display concept
- New Audi virtual cockpit curved OLED as digital instrument cluster
- Innovative film vents in front seat backs to ventilate the rear compartment
- Steering wheel with touch surfaces in the spokes
- Online connection via LTE, wide range of connectivity functions available

Full version:

All-electric into the automotive future – the Audi e-tron quattro concept

Its design, with the extremely low drag coefficient of 0.25, was created in the wind tunnel; the powerful electric drive with up to 370 kW follows the e-tron quattro concept: The Audi e-tron quattro concept, the battery-electric technology study from Audi at the International Motor Show (IAA) 2015, is a whole new caliber of sporty SUV. Its range of more than 500 kilometers (*310.7 mi*) gives it full everyday usability. Leading technical solutions in the areas of operation and piloted driving also offer a high level of comfort and convenience. The Audi e-tron quattro concept provides a foretaste of the first production electric car from the brand with the four rings, which is scheduled to launch in 2018.

Technology of tomorrow: e-tron quattro drive

The second-generation modular longitudinal platform offers Audi broad technical possibilities, including with the drive train. The Audi e-tron quattro concept technology study uses three powerful electric motors – one on the front axle and two on the rear axle. Total output is 320 kW, with boosting enabling the driver to temporarily mobilize up to 370 kW.

The electric motors are highly efficient over a wide engine speed range, including at low and intermediate load. They thus combine emotional driving pleasure, a high level of active safety and, above all, an extensive range. The electric motors are liquid-cooled, as are the power electronics specially developed for the technology study.

The concept with three electric motors, which Audi is presenting for the first time, makes the Audi e-tron quattro concept an electrified quattro – an e-tron quattro. The controller continuously computes the optimal interplay of the electric motors for every driving situation. At low load, the motor on the front axle is solely responsible for propulsion. When the driver floors the accelerator and all three electric engines are working together, 370 kW of output and more than 800 Nm (*590.0 lb-ft*) of torque are available. The sprint from zero to 100 km/h (*62.1 mph*) is completed in 4.6 seconds; the top speed of 210 km/h (*130.5 mph*) is quickly reached.

The key drive train management parameters are the position of the accelerator, the mode chosen in the Audi drive select dynamic handling system, the driving program – S or D – and the battery charge level. The data about the near surroundings provided by the sensors for piloted driving, the predictive route data from the navigation system and the real-time traffic information from Audi connect also flow into this computation, always with the aim of optimally adjusting the drive train to the current conditions.

The focus is on not just powerful performance, but also maximum efficiency. Before even starting out, the driver can have the Audi e-tron quattro concept compute a drive train strategy to minimize energy consumption. When underway, the Audi e-tron quattro concept recovers large amounts of energy. Up to moderate braking, the electric motors are solely responsible for decelerating the vehicle. The hydraulic brakes only come into play for heavy braking. The driver can adjust the degree of recuperation in stages. At the lowest setting, no energy is recovered at all in certain situations. Instead, the sport SUV glides with no deceleration torque because the drive train is decoupled.

The concept with the two electric motors on the rear axle offers major advantages when it comes to sporty handling. The Torque Control Manager, which works together with the Electronic Stabilization Control (ESC), actively distributes the power between the rear wheels as necessary. This torque management system provides for maximum dynamics and stability. The adjustments are made fast as lightning thanks to the virtually instantaneous response of the electric motors. Whether lateral or longitudinal dynamics, the drive concept of the Audi e-tron quattro concept adapts perfectly to every situation.

Ideal installation position: The lithium-ion battery

The technology study's lithium-ion battery is positioned between the axles below the passenger compartment. This installation position provides for a low center of gravity and a balanced axle load distribution of 52:48 (front/rear). And that gives the sporty SUV outstanding driving dynamics and driving safety compared with other vehicles in the segment. The large battery block is bolted to the floor structure of the Audi e-tron quattro concept. Thanks to its modular design, the battery is in principle also suitable for other automobile concepts.

The liquid-cooled battery has an energy capacity of 95 kWh. A full charge provides for a range of over 500 kilometers (*310.7 mi*) in the NEDC. The Combined Charging System with two connectors enables charging with alternating current (AC) and direct current (DC). With direct current and the charging power of 150 kW targeted by Audi, the large battery can store enough energy for over 400 kilometers (*248.5 mi*) in around just 30 minutes.

With its geometry and slightly inclined installation position, the innovative charging socket is particularly ergonomic. Alternatively, the Audi e-tron quattro concept can be charged contactlessly by induction, using Audi Wireless Charging (AWC) technology. This involves placing a charging plate with integrated spool on the parking space and connecting it to the mains supply. The piloted parking system positions the Audi e-tron quattro concept over the charging plate with pinpoint accuracy. The charging process then begins automatically. The magnetic alternating field induces an AC current in the secondary spool mounted across the gap in the underside of the car. The AC current is converted to DC by the vehicle's power electronics and the battery is charged with up to 11 kilowatts of power.

Once the battery is fully charged, the process ends automatically. The Audi Wireless Charging technology is over 90% efficient, almost as effective as charging via a cable. The alternating field does not pose any risk to people or animals; it only builds up when a car is positioned above the induction charging plate. Drivers can monitor the charging process on their smartphone using an app from the Audi connect portfolio. All charging and climate control functions can be controlled remotely with this app.

Completely covered with solar cells, the 1.98 meter (*6.5 ft*) solar roof is also integrated into the technology study's energy management system. It is the world's largest module installed in an automobile. Its entire surface is covered in solar cells – the solar roof of the Audi e-tron quattro concept thus achieves the greatest solar output by far in the automotive sector. It feeds electricity at up to 320 watts into the battery as soon as the Audi e-tron quattro concept is parked or driven in the sun. In the central European climate, it can contribute up to 1,000 kilometers (*435.0 mi*) of additional range per year – another top value. In the summer, the solar roof produces enough power to run the auxiliary heating for the interior, to provide a pleasant temperature inside the vehicle before the journey even starts.

The heat pump also contributes to the efficiency of the concept study. It uses the waste heat of the electrical components to climatize the interior and is thus a central component of the thermal management system.

Cd 0.25: The aerodynamics

Aerodynamics are crucial for a purely electric vehicle. The range of over 500 kilometers (*310.7 mi*) achieved by the Audi e-tron quattro concept is also due in part to its new design, which is strongly oriented on aerodynamic principles. With its extremely low drag coefficient of 0.25, the sport SUV glides through the wind easily, quietly and highly efficiently.

4.88 meters (*16.0 ft*) long, 1.93 meters (*6.3 ft*) wide and with a 2.91 meter (*9.5 ft*) wheelbase, the Audi e-tron quattro concept is slotted between the Audi Q5 and the Audi Q7. At just 1.54 meters (*5.1 ft*), it is much lower in height than the two production models. The greenhouse is particularly low, the roofline drops down again quickly and the D-pillars are correspondingly flat. The architecture has markedly coupe-like traits.

The study's exterior design combines technical measures for reducing aerodynamic drag with creative design solutions. The new design language was developed in close collaboration between aerodynamics engineers and designers. This concept includes a long body along which the air flows cleanly, an in-drawn tail end with a sharp spoiler lip, exhaustive fine-detailing on the outer skin and the wheels, and a completely enclosed, aerodynamically optimized floor pan with newly designed microstructures. These resemble the surface of shark skin.

The aerodynamics concept also includes the new, in part movable elements at the front, on the sides and at the rear of the Audi e-tron quattro concept. At speeds above 80 km/h (*49.7 mph*), they direct the flow of air to improve flow around and through the car. In the engine hood, two seals, each with four louvers, regulate the flow of air through the thermal management components installed in the front end. The suction effect on the surface of the hood makes it possible to reduce the electrical power of the fan.

At higher speeds the spoiler on the rear hatch extends by as much as 100 millimeters (*3.9 in*), thus elongating the separating edge. At the same time the diffuser extends to the rear. The targeted merging of the air flows from the roof and the underfloor regions provides for positive aerodynamic effects.

Compact electric motors in the side sills are activated at higher speeds. These force the rear segments of the strips 50 millimeters (*2.0 in*) outward like a funnel so that the air flows past the rear wheels.

Sophisticated aeroacoustics ensure that wind noise in the Audi e-tron quattro concept remains impressively low even during fast driving. There is no engine noise in any case – the peace and quiet on board makes the electric driving experience even more fascinating.

e-tron light signature with new OLED technology: The front end
Audi presents the new design language of its e-tron models at the front of the technology study. The Singleframe grille emphasizes the width of the car and five horizontal aluminum slats link the five OLED elements of the light signature to one another. The top edge bears the Audi rings. The octagonal shape of the Singleframe and the four vertical sections in the background place the concept study visually in the Audi Q family.

The bottom section of the grille bears an e-tron logo that lights up briefly to greet the driver and passengers when they get in. Also integrated into this section is a visually subtle compact sensor rack that includes most of the sensors for the driver assistance systems and the new systems for piloted driving. Additional sensors are invisibly integrated into the skirts, with the advantage that they are well protected in minor collisions.

The Audi e-tron quattro concept generates all the main lighting functions with Matrix laser technology, the next step in the development of automotive lighting technology. Broken down into tiny pixels, the beam of light from the Matrix laser headlights can illuminate the road in high resolution and with precise control.

The bottom section of the front end houses a new, distinctive lighting signature comprising five lighting elements. Each of these combines an LED luminary with an extremely flat OLED element (organic light-emitting diode). The OLED elements emit a homogeneous light, are dimmable and can present a variety of lighting scenarios.

The Audi e-tron quattro concept marks the world premiere of Matrix laser OLED technology at the front of a vehicle and epitomizes “Vorsprung durch Technik” in the field of automotive lighting.

The front apron of the Audi e-tron quattro concept tapers into a spoiler drawn far forward. The inflowing air is supplied to the heat exchangers of the thermal management system, which among other things controls the temperature of the drive components. The air flows through the front end and is drawn out again through slots by the underpressure that exists above the engine hood. This effect makes it possible to reduce the electrical power of the fan. The four louvers in the hood open and close electrically depending on the driving situation and cooling requirement.

Applied aerodynamics: The flanks

The outstanding aerodynamics of the concept study are also visible in the side view. The elegant shoulder line forms distinctive blister contours above the wheels in an expression of Audi's quattro genes. Between the shoulder line and the greenhouse is a prominent, small-radius fillet running the length of the body and elegantly extending it. The wheel houses carry wide wheel mirrors that visually reduce the metal volume of the flanks. Below the shoulder line, the door handles are inset in the body of the door for improved aerodynamics. The door handles extends outward electrically when touched.

Integrated into the side sills is a light strip in Matrix LED technology that also provides new functions. Its white light illuminates when the driver approaches the Audi etron quattro concept with the remote control key. This "lightway" dynamically adjusts to the position of the driver and accompanies them until they get in. A similar lighting scenario plays out when exiting the vehicle. Two blue horizontal lines light up during piloted driving.

Small cameras replace the exterior mirrors. This technology offers other advantages besides improved air flow and reduced wind noise. The blind spot of the physical exterior mirror is eliminated, as is the obstruction of the diagonal view to the front. The camera images are shown on separate displays in the doors. Audi is showing this technology as a concrete foretaste of the production version.

The side walls end at the rear of the vehicle in vertical separating edges, at which the air flowing around the vehicle separates cleanly. Compact electric motors in the side sills are activated at higher speeds. They force the rear segments of the strips 50 millimeters (*2.0 in*) outward like a funnel to direct flow of air past the rear wheels.

Streamlined: The rear end
The cabin of the Audi e-tron quattro concept tapers strongly toward the rear end. The shoulder line extends across the rear cargo hatch, giving it structure. Running along this line is an LED light guide that joins the rear lights, thus underscoring the width of the car. Similar to the units up front, the rear lights are also split into two zones. The upper section contains nine OLED units arranged in a flat line that assume the tail light functions. Three more overlapping units are below these.

The package: Ample space for four Thanks to its intelligent package, the Audi e-tron quattro concept offers plenty of space for passengers and luggage. The driver and up to three passengers sit in sporty individual seats; rear leg room is generous. Despite the dynamic roof contour, there is sufficient headroom for all passengers.

The luggage compartment of the Audi e-tron quattro concept holds 615 liters (*21.5 cu ft*) in the normal configuration. Because the all-electric sports SUV has no exhaust system, the luggage compartment floor is particularly low. An illuminated multifunction compartment set into the floor holds two Monowheels – electrically powered, nimble unicycles for driver and passengers. They are ideal for covering short distances in town and thus round out the mobility concept perfectly. They can be charged via an inductive interface in the luggage compartment – an extremely convenient solution.

The compartment’s glass cover, which also serves as the luggage compartment floor, opens and closes electrically. Folding down the rear seats more than doubles luggage capacity to 1,725 liters (*60.9 cu ft*).

Clear shapes: The interior
With its taut lines, clear shapes and taut, sinewy surfaces, the interior of the technology study has a light and open feel to it. The instrument panel slopes downward toward the passengers in two levels. The air vents are integrated into the step between the levels and the large, encircling arc (wrap-around).

Because the electric drive has no propshaft, the center console seems to float. This design underscores the open spaciousness while also offering additional storage. Inside the center console are two Easy Slots. These connect two smartphones to the electrical system and charge them inductively, if needed.

The bottom section of the front seats is puristically sporty. The zone with the head and shoulder restraints has been designed for maximum comfort. Integrated into the backrests of the front seats are small air vents with an innovative concept: Two so-called film vents that move in opposite directions ventilate the complete rear compartment.

OLED display: the next step with the Audi virtual cockpit

The operating and display concept of the Audi e-tron quattro concept is deeply integrated into the plastic, driver-oriented architecture of the cockpit. It is characterized by the large OLED displays. Here Audi is continuing the line of its most recent concept studies. Some details will make their way into production vehicles in the foreseeable future.

Three OLED displays are located in front of the driver. The new Audi virtual cockpit curved OLED is a further development of the Audi virtual cockpit that first appeared in production vehicles in 2014: a free-standing, thin OLED display with a narrow aluminum clasp and a slightly curved, ergonomic surface. This curvature ensures that the driver can easily read all the information displayed. Also new is the free configuration of the contour, which breaks from the typical rectangular format used previously. This is a strength of OLED technology, in which extremely thin films are used.

The basic menu of the Audi virtual cockpit curved OLED displays the speed, charge status of the battery and range. Its sophisticated graphics give the two-dimensional displays a 3D look.

To the left and right below the Audi virtual cockpit curved OLED are two touch displays. The driver controls the lighting functions and the systems for piloted driving with the left display. The 14-inch display on the right is asymmetric, just like the instrument cluster. It is used to control media lists and navigation maps. In Sport mode, it displays the prevailing acceleration forces or the route.

The central display reacts to optical and acoustic signals. It is therefore extremely well suited for communication while driving, and especially for monitoring children. If the child in the back seat wants to talk to the driver, the child’s face appears on the central display on the instrument panel.

Two more displays are found on the center console. One is installed flush with the console and displays the drive status. The front display, which is curved upward, offers some gesture controls and visualizes the climate control system, which is operated using virtual sliders. Four freely-programmable preset buttons enable the driver to call up important information such as weather, appointments or addresses. Two more displays, likewise with slight curved surfaces, are found in the front section of the doors and serve as digital exterior mirrors. Their specially processed camera image is bright even in poor lighting conditions, with good contrast and free of glare.

The two rear passengers in the Audi e-tron quattro concept have their own OLED displays. They use these to operate the climate control and infotainment for their area or to exchange media data with the driver. The concept study is connected to the Internet via a fast LTE module using the fast standard. Passengers can surf the web and send emails with their mobile devices. Tailored services from the Audi connect portfolio are delivered to the car for the driver.

The driver of the Audi e-tron quattro concept can also control numerous functions using the flat-bottomed, deeply bowled steering wheel, the horizontal spokes of which have special touch surfaces. Contours milled in the glass help to guide the thumb, and each input is followed by a slight vibration. The driver uses two paddles to choose the level of recuperation.

On the center console is a low, wide selector lever with a button for the driving programs. With a light tap forward or back the driver changes between the positions P, R, N, D and S.

Graduated gray tones: Colors and materials

The interior of the Audi e-tron quattro concept is bathed in a cool gray suggestive of technology and whose tones are finely graduated from top to bottom. The floor of fine Nappa leather also includes fabric floor mats with a thick, rubber-like yarn. This yarn is particularly durable and provides good hold.

On the seating surfaces and door top shoulders, sporty Alcantara provides a subtle contrast to the soft fine Nappa leather, which covers the head restraints, side bolsters, backrests and armrests. The seats have a special stitch pattern; the instrument panel has a leather finish. The frames and clasps of the controls and seats are made of darkened, brushed aluminum, whose polished, bright edges set sophisticated accents.

High-tech from Audi: The chassis

The dynamic character of the Audi e-tron quattro concept is also reflected in the chassis. The adaptive air suspension sport – the air suspension with controlled damping – contributes to efficiency. Depending on the vehicle speed, the body is lowered in two stages by up to 30 millimeters (*1.2 in*), thus reducing drag. The adaptive air suspension sport can be controlled using the Audi drive select system.

The front and rear axles are lightweight, five-link constructions made of aluminum and high-strength steel. They wheels measure 22 inches in diagonal and are fitted with 265/40 series tires optimized for low rolling resistance. Large carbon fiber-ceramic brake discs with a diameter of 20 inches up front and 19 inches in the rear stop the Audi e-tron quattro concept safely and reliably.

The dynamic-all-wheel steering combines a variable-ratio, electrically powered, dynamic steering system on the front axle with steered rear wheels. At low and moderate speeds, these turn up to five degrees in the opposite direction of the front wheels, making the Audi e-tron quattro concept manageable and spontaneous while maneuvering and steering into corners. At higher speeds they steer in the same direction as the front wheels, if necessary. Now the car can also perform quick avoidance maneuvers calmly and serenely.

Leading role: Piloted driving

The Audi e-tron quattro concept is capable of both piloted parking at the charging plate and piloted driving. To do this, its radar sensors work together with a video camera, ultrasonic sensors and a laser scanner than provides highly precise data about objects up to 80 meters (*262.5 ft*) away.

The central driver assistance controller, or zFAS for short, is located in the luggage compartment. A wide range of sensor information comes together here. The zFAS uses this information to compute a complete model of the surroundings in real time and makes this information available to all systems involved. Its computing power corresponds to the entire electronics architecture of a well-equipped mid-size car. Thanks to the high degree of integration, the board is only the size of a tablet PC, however. The zFAS and environment sensor system are a concrete foretaste of technologies that will soon appear in Audi production vehicles.

Innovations: From A to Z

The Audi e-tron quattro concept is full of groundbreaking innovations in numerous fields of technology. This glossary briefly explains them – from A for “Aerodynamics” to Z for “zFAS.”

Aerodynamics

The aerodynamics engineers and exterior designers worked closely together in the wind tunnel to develop the exterior of the Audi e-tron quattro concept. The outstanding drag coefficient of 0.25 is the result of both active aerodynamics and static aerodynamic measures. In this way, Audi has combined a front spoiler, steeply pitched separating edges at the rear and aerodynamically optimized wheels for the first time. Together with the aerodynamically optimized, microstructured floor pan, the study sets new standards for aerodynamic automobiles. The Audi e-tron quattro concept features active components at the side sills and the rear. At speeds from 80 km/h (*49.7 mph*), they direct the slipstream to improve aerodynamics. The flaps in the sills in front of the rear wheels, the two rear spoilers – on the roof and in the skirt – and the closeable louvers of the thermal management system in the engine hood also contribute to optimizing the aerodynamics.

Drive strategy

Three powerful electric motors make the Audi e-tron quattro concept an e-tron quattro, with one motor installed on the front axle and two on the rear axle. The power of the individual electric motors is optimally distributed for the respective driving situation. Together they produce 320 kW and deliver 800 Nm (*590.0 lb-ft*) of torque, with an output of 370 kW briefly possible in overboost mode. The two electric motors on the rear axle enable torque vectoring – the active, need-based distribution of power to the wheels.

Audi connect

The term “Audi connect” encompasses the complete package of technologies used by Audi to link its cars to their owners, the Internet, the traffic infrastructure and other cars. Audi is rapidly expanding its range of tailored services and apps.

Audi virtual cockpit curved OLED

The Audi virtual cockpit curved OLED is the further development of the Audi virtual cockpit in the Audi TT, Audi Q7 and Audi R8. It is based on state-of-the-art OLED technology. For the first time ever in the automotive field, a curved, 14-inch OLED display is being used as an instrument cluster.

Audi Wireless Charging (AWC)

The Audi e-tron is equipped with Audi Wireless Charging technology for contactless induction charging. A charging plate with an integrated spool is placed on the parking space and connected to the mains supply. Using its piloted parking system, the Audi e-tron quattro concept positions iteself over the charging plate with pinpoint accuracy. The charging process then begins automatically. As soon as the battery is fully charged the process stops again. The Audi Wireless Charging technology is over 90% efficient, almost as effective as charging via a cable. The alternating field does not pose any risk to people or animals. It only builds up when a car is positioned above the induction charging plate.

Battery technology

The large battery of the Audi e-tron quattro concept, just like the battery of the Audi R8 e-tron, follows a basic modular concept. It is in principle also suitable for use in other models. Audi is using it for the first time in an SUV. The modular philosophy also means that Audi will always be able to use the best cell technology available on the market, regardless of whether prismatic, pouch or round cells.

CCS

The abbreviation “CCS” stands for combined charging system. Electrified cars with this plug system can be charged with both alternating current (AC) and direct current (DC). Power output is significantly higher when charging with direct current and the charging time correspondingly shorter because the electricity can flow directly into the battery without additional rectification.

Dynamic-all-wheel steering

The dynamic-all-wheel steering, which is already available as an option in the new Audi Q7, combines a dynamic steering system on the front axle with a steering system for the rear wheels. Depending on the speed and driving situation, the rear wheels turn either opposite or in the same direction as the front wheels. This makes the handling of the Audi e-tron quattro concept even more spontaneous and stable, and it is also very maneuverable at low speeds.

Unicycle scooter (MonoWheel)
A storage compartment in the luggage compartment floor contains two electric MonoWheels – fast, nimble unicycles for covering short distances in town that round out the mobility concept perfectly. They can be charged inductively from the car's electrical system.

e-tron
e-tron is the abbreviation used by Audi for all production models that can be charged from an external power source and drive significant distances – generally 50 kilometers (*31.1 mi*) electrically. In the future, Audi will offer one e-tron model in each segment.

e-tron light signature
The company introduced a uniform light signature as an identifying feature of its e-tron models with the Audi prologue Avant. At the front of the car, multiple narrow, individual OLED luminaries are arranged horizontally staggered one above the other. They produce white daytime running lights in the direction of travel. The embedded OLED elements emit blue light in an upwards direction. They can be controlled in segments, enabling individual lighting scenarios adapted to the respective situation.

Film vents
Air vents for the rear seat area are integrated into the rear of the backrests of the Audi e-tron quattro concept. These use a new technology: Films that can be displaced minimal distances enable draft-free, diffuse ventilation for the rear passengers.

Child monitor
The child monitor in the Audi e-tron quattro concept reacts to optical and acoustic signals. If the child in the back seat wants to talk to the driver, the child's face appears on the central display on the instrument panel.

Lightway
When the driver approaches the technology study with the remote control key, a band of light in the area of the side sill lights up in welcome. Proximity sensors detect the direction in which the driver is moving, and the carpet of light is dimmed up accordingly. Light and color scenarios can be individually configured.

Matrix laser technology

Matrix laser technology, in which a laser generates the light, debuted in racing. In the future, this will enable the ideal light pattern for practically every situation, such as special lighting for construction zones and similar bottlenecks. In this case, two strips of light about 15 meters (*49.2 ft*) long are projected onto the road to indicate the vehicle's width. The light is a big help when driving through construction zones. The driver can follow it as if on rails. This is the first time that Audi has shown Matrix laser technology in an SUV.

MLB evo

The MLB evo is the second-generation modular longitudinal platform for models with longitudinally mounted front engines. It defines a matrix of components – from the chassis to the assistance systems – and also defines the framework for production in the factories. The first model based on the MLB evo that Audi brought to market was the new Audi Q7.

OLED technology

The Audi e-tron quattro concept uses OLED technology on the exterior for the e-tron signature lighting in the form of segmented and individually controlled OLED light units. An OLED (organic light-emitting diode) comprises two electrodes, at least one of which must be transparent. They enclose a layer of an organic semiconducting material that begins to illuminate when a weak direct current is applied to it. The OLED luminaries boast extremely high-contrast images and also consume little electricity.

Piloted driving

In the future, the systems that Audi is developing for piloted driving will be able take over the driving if the driver so desires, for instance in slow-moving traffic. Piloted driving makes driving even safer, more comfortable and more efficient. Featuring a variety of new assistance systems, the new Audi Q7 offers a prestage of piloted driving.

Solar roof

The solar roof of the Audi e-tron quattro concept is 1.98 meters (*6.5 ft*) long, and thus the world's largest module installed in an automobile. It achieves the greatest solar output by far in the automotive sector – thanks to the entire roof being covered with solar cells. It feeds electricity to the traction battery whenever the car is parked or driven in the sun. It achieves an output of up to 0.4 kW, enough to extend the range by as much as 1000 kilometers (*435.0 mi*) per year.

Door handles

Even the door handles of the technology study are a new development. They are sunk into the body of the door to produce a nearly seamless surface, which contributes to the aerodynamics concept. When the driver's hand approaches, the handles extend electrically.

Virtual exterior mirror

The virtual exterior mirrors – a system comprising two cameras and OLED displays per side in the front section of the doors – replace the conventional exterior mirrors in the Audi e-tron quattro concept. They offer major advantages with respect to aerodynamics and safety by expanding the field of view, particularly in urban traffic or on very winding roads. This is the first time that Audi is showing this technology in a production-relevant SUV.

zFAS

The zFAS (central driver assistance controller) is the "super brain" or also the mastermind for piloted driving as Audi will soon bring to production vehicles. It uses all of the bundled sensor information to very quickly compute a complete model of the car's surroundings and forwards the information to the systems for piloted driving.