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## **The new SUV among the plug-in hybrids Audi Q7 e-tron 3.0 TDI quattro**

Compact version	2
Summary	4
At a glance	9
Full version	12
Plug-in hybrid drive	12
quattro drive and chassis	18
Body and exterior design	20
Interior	22
Controls and infotainment	24
Audi connect	26
Driver assistance systems	27

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

Compact version

## **The best of both worlds – the Audi Q7 e-tron 3.0 TDI quattro**

**It accelerates from zero to 100 km/h (62.1 mph) in 6.2 seconds, yet consumes just 1.8 liters of diesel per 100 kilometers (130.7 US mpg). The Audi Q7 e-tron quattro is as sporty as it is comfortable and at the same time particularly efficient. In all-electric mode, it has a range of up to 56 kilometers (34.8 mi) while producing zero local emissions. It is the world's first plug-in hybrid with a V6 TDI engine and quattro drive.**

The plug-in hybrid brings the best of both worlds to the road. The Q7 e-tron 3.0 TDI quattro combines the advantages of a combustion engine with those of an electric drive and sets new benchmarks in the competitive field.

### **Sporty power and low consumption**

The plug-in hybrid drive in the Audi Q7 e-tron quattro delivers plenty of power in any situation. The 3.0 TDI engine and the electric motor together produce a combined system output of 275 kW (373 hp) and 700 Nm (516.3 lb-ft) of torque. The sprint from 0 to 100 km/h (62.1 mph) takes just 6.2 seconds; top speed is 230 km/h (142.9 mph), 135 km/h (83.9 mph) on electric power alone. Thanks to the 75 liter (19.8 US gal) fuel tank, total range is as much as 1,320 kilometers (820.2 mi). The advantage of the plug-in hybrid: Whereas cars with classic drive trains lose energy during braking, the Q7 e-tron quattro recuperates. In other words, during braking, it converts kinetic energy to electrical energy, which it can use again when accelerating.

The advantage of the rechargeable battery in the Q7 e-tron quattro is that it largely covers the needs of daily mobility. In all-electric mode with 94 kW peak output, customers can drive up to 56 kilometers (34.8 mi) with zero local emissions.

The Audi Q7 e-tron quattro also sets standards in consumption: According to the ECE standard for plug-in hybrids, it uses just 1.8 liters of diesel per 100 kilometers (130.7 US mpg). This corresponds to emissions of 48 grams CO<sub>2</sub> per kilometer (77.2 g/mi). The climate control system is also designed for maximum efficiency.

With the integrated heat pump, the thermal management system uses the waste heat of the electrical components and was specially developed for the SUV. Audi is the first manufacturer worldwide to use this technology in a production plug-in hybrid.

### **Traveling in luxury**

The Audi Q7 e-tron quattro offers the most spacious interior in its segment and can be customized with numerous luxury-class comfort and convenience features. The display and operating concepts also set benchmarks. The standard Audi virtual cockpit and MMI system have been redeveloped from the ground up. Their operation is simple and features intelligent logic.

In the Audi Q7 e-tron quattro, the standard MMI navigation plus, which includes the Audi connect internet module, works closely with the hybrid management system. Navigation data and real-time traffic information can thus be used to compute an efficient hybrid strategy for the best route to the destination before starting out. Underway, the predictive efficiency assistant helps the driver to save fuel. It generates a detailed image of the route up to three kilometers (*1.9 mi*) ahead and uses visual cues to suggest releasing the accelerator when appropriate. At the same time, the active accelerator pulses once against the sole of driver's foot. This new assistance system is another pioneering technology from Audi.

## Summary

### **Great class, low emissions – the Audi Q7 e-tron 3.0 TDI quattro**

**With the Q7 e-tron quattro, Audi presents the world's first plug-in hybrid model with a six-cylinder TDI engine and quattro drive. The SUV sets standards thanks to 275 kW (373 hp) of system power and 700 Nm (516.3 lb-ft) of system torque: It sprints from 0 to 100 km/h (62.1 mph) in 6.2 seconds and consumes not more than a best-in-segment 1.8 liters of fuel per 100 kilometers (130.7 US mpg) in the New European Driving Cycle (NEDC).**

The 3.0 TDI, a highly efficient, latest-generation V6 diesel engine, delivers 190 kW (258 hp) of power and 600 Nm (442.5 b-ft) of torque.

The electric motor produces 94 kW of power and 350 Nm (258.1 lb-ft) of torque. Together with a decoupler, it is integrated into the eight-speed tiptronic. The automatic transmission boasts high efficiency and low weight. During fast cornering, the quattro permanent all-wheel drive works closely with the wheel-selective torque control, an intelligent software feature. This brakes the inside wheels ever so slightly, thus further enhancing the car's agility and stability.

#### **56 kilometer (34.8 mi) electric range: best value in the segment**

The lithium-ion battery comprises 168 prismatic cells and is liquid-cooled. With a capacity of 17.3 kWh, it allows a 56 kilometer (34.8 mi) range in electric mode in the NEDC – like the fuel consumption another record in the segment. The total range with the TDI engine is 1,320 kilometers (820.2 mi).

The new multi-phase charging technology allows charging with 7.2 kW of power. A full charge on an industrial outlet thus takes less than two-and-a-half hours. Audi also offers a package of special e-tron services, from switching to green electricity (Audi Energy) to the "Audi Charge&Fuel Card". With the e-tron services in the Audi connect portfolio, drivers can use their smartphones to control such functions as charging and heating or cooling.

### **Maximum efficiency: hybrid management**

The hybrid management system controls the operating states of the Audi Q7 e-tron quattro intelligently, flexibly and with high efficiency. The driver can choose between three modes. "EV" mode prioritizes electric driving, while in "hybrid" mode the decision regarding the drive type is left largely to the hybrid management system. In "battery hold" mode it saves the available electric energy for a later time.

Depending on the driving situation, the SUV can boost, coast and recuperate. During everyday driving, most braking operations use the electric motor, which then works as a generator. The Audi Q7 e-tron quattro normally starts off purely on electric power. When switching into hybrid mode and for boosting, the driver has to depress the active accelerator (another Audi innovation) beyond a certain point of resistance. The position of this pressure point varies depending on the charge state.

According to the standard applicable for plug-in hybrids, the Audi Q7 e-tron quattro consumes just 1.8 liters of fuel (*130.7 US mpg*) in the NEDC, corresponding to 48 grams CO<sub>2</sub> per km (*77.2 g/mi*). The combined system outputs 275 kW (373 hp) and delivers 700 Nm (*516.3 lb-ft*) of torque. The SUV thus accelerates from 0 to 100 km/h (*62.1 mph*) in 6.2 seconds and reaches a top speed of 230 km/h (*142.9 mph*).

### **Global first: the heat pump**

One important efficiency component is the specially developed thermal management system with a heat pump. This makes it possible for the waste heat from the electrical drive components to be made available to the interior of the Q7 e-tron quattro. It heats and cools the interior quickly and effectively. At the same time, the fact that it uses so little energy significantly increases the electric range compared with a conventional electric heating system. Audi is the first manufacturer worldwide to use this technology in a production plug-in hybrid and is consequently setting new standards in the areas of interior comfort and climate control efficiency.

In the Audi Q7 e-tron quattro, the likewise standard MMI navigation plus works closely with the hybrid management system. This makes it possible to use navigation data and real-time traffic information to compute an ideal driving strategy at the start of the trip – even for longer distances.

Underway, the predictive efficiency assistant provides precise near-field information to help the driver save fuel. Using navigation and camera data as well as the information from the radar sensors of the optional adaptive cruise control (ACC), it generates a detailed image of the route up to three kilometers (1.9 mi) ahead. On approaching speed limit signs, town signs, bends, traffic circles and intersections, the system visually signals the driver well in advance to release the accelerator pedal. At the same time, the active accelerator pulses once against the sole of his or her foot.

### **Extremely versatile: chassis**

As an all-rounder for leisure, family, sports and business, the Audi Q7 e-tron quattro also effortlessly masters easy terrain. Hill descent control and an off-road mode for the electronic stabilization control ESC are standard. A tilt angle display is standard with the optional air springs.

The Audi Q7 e-tron quattro combines comfort with great sporting talent. The electromechanical power steering is sensitive and conserves energy. The five-link suspensions front and rear are very light and contribute greatly to the outstanding handling characteristics. The low center of gravity and relatively low curb weight also play major roles here. This is due largely to the body with its numerous components of hot-shaped steel and aluminum.

Even the base version of the spacious plug-in hybrid SUV is impressively comfortable. Audi offers an adaptive air suspension with controlled damping as an option. The driver can adjust its characteristic via the standard Audi drive select dynamic handling system. It offers up to seven modes and incorporates such things as the engine management system, engine sound, automatic transmission, steering assistance, cruise control, adaptive cruise control (ACC), Matrix LED headlights and ambient lighting.

Making their world premiere in a diesel engine are the active engine mounts in the Audi Q7 e-tron 3.0 TDI quattro. Utilizing electromagnetic oscillation coil actuators to induce phase-offset counter oscillations, they largely eliminate vibrations. The engine mounts are always active when the combustion engine is running.

### **Specific details: design**

5.05 meters (*16.6 ft*) in length, the Q7 e-tron quattro combines a powerful, masculine design with elegant understatement. The striking emphasis of the wheels and the edges over the wheels – the “quattro blisters” – clearly illustrate the Audi genes. The tailgate wraps around the steeply raked D-pillars – typical of the brand’s Q models. Hybrid models feature a special design for the sculpted Singleframe grille, the air inlets and the 19- and 20-inch wheels. Customers can also order illuminated door sill trims with the e-tron logo.

### **Elegance and quality: interior**

The Audi Q7 e-tron quattro offers the most spacious interior in its segment. The rear seats have adjustable backrests and can be moved fore/aft as desired. The lithium-ion battery takes up little space. Luggage compartment capacity is 650 liters (*23.0 cu ft*) and can be expanded to a maximum of 1,835 liters (*64.8 cu ft*). A power tailgate is standard; gesture control is available as an option.

Interior design elements such as the wrap-around – the long arc around the driver and front passenger – the trim strips and the row of air vents emphasize the generous width. The two-part trim areas allow many individual combinations; the range of upholstery corresponds to the luxury class. The workmanship is of the accustomed high standard.

### **Tailored: controls & displays**

The Audi virtual cockpit is standard in the Q7 e-tron quattro. The all-digital instrument cluster with its 12.3-inch display presents all key information in top-quality graphics. The driver can call up various levels of information: The Audi virtual cockpit shows the power meter, energy flow, range and battery charge state.

Audi has expanded the infotainment to include essential e-tron displays. For example, fuel economy statistics and a graphic display of the electric range is shown on the navigation map. The driver can program times for charging as well as preheating or cooling and adapt them to his or her requirements, such as departure time, so as to save resources and costs.

This is made possible by the second-generation modular infotainment platform, which uses the high computing power of the Tegra 30 chip from Audi’s partner Nvidia. This chip makes the standard MMI navigation plus extremely powerful. Operation is by voice, with the multifunction steering wheel or with the brand new MMI all-in-touch, the touchpad with haptic feedback.

Audi connect, which is also standard, connects the Q7 e-tron quattro to the internet via the fast LTE standard. With the Audi MMI connect app, the smartphone can be used to remotely control charging and interior heating or cooling, call up the battery status and display data about past trips. Passengers can surf the web and send emails with their mobile devices via the Wi-Fi hotspot. Also indicative of the brand's power to innovate are the supplemental components: the Audi tablet for the Rear Seat Entertainment, the sound systems from Bang & Olufsen or Bose with 3D sound and the Audi phone box, which easily connects the cell phone with the car and charges it inductively.

### **Comfort and safety: driver assistance systems**

The Audi Q7 e-tron quattro also sets standards in assistance systems. Besides the predictive efficiency assistant, other useful systems for everyday driving include the collision avoidance assist, turn assist, cross traffic assist rear and trailer maneuver assist. The adaptive cruise control including traffic jam assist takes over the braking, acceleration and steering from the driver on well-paved roads at speeds of up to 65 km/h (*40.4 mph*) as long as traffic is slow-moving.



## At a glance

# The Audi Q7 e-tron 3.0 TDI quattro

### Drivetrain

- The 3.0 TDI is state of the art, produces 190 kW (258 hp) and 600 Nm (*442.5 lb-ft*) of torque between 1,250 and 3,000 rpm.
- Efficient electric motor with 94 kW output and max. 350 Nm (*258.1 lb-ft*)
- System values: Power output 275 kW (373 hp), torque 700 Nm (*516.3 lb-ft*)
- Lithium-ion battery with 17.3 kWh energy capacity in the luggage compartment; full charge from an industrial outlet in two-and-a-half hours
- Superior performance: from 0 to 100 km/h (*62.1 mph*) in 6.2 seconds, top speed 230 km/h (*142.9 mph*), average consumption according to the ECE standard for hybrids just 1.8 liters of diesel per 100 kilometers (*130.7 US mpg*), corresponding to 48 grams CO<sub>2</sub>/km (*77.2 g/mi*)
- Electric range in the NEDC up to 56 kilometers (*34.8 mi*); total range up to 1,320 kilometers (*820.2 mi*)
- Three hybrid modes: EV, hybrid and battery hold, plus boosting, coasting and recuperation
- Active accelerator pedal
- Eight-speed tiptronic and newly developed quattro permanent all-wheel drive

### Design and body

- Sculpted Singleframe grille, quattro blisters above the wheels, steeply raked D-pillars and wrap-around tailgate
- LED headlights standard; optional Matrix LED technology
- Special e-tron features such as decorative grilles in the radiator grille and rear diffuser, e-tron-specific wheel design: 19- and 20-inch wheels, illuminated door sill trims with e-tron logo optional
- Length 5.05 meters (*16.6 ft*), wheelbase 2.99 meters (*9.8 ft*), width 1.97 meters (*6.5 ft*), height 1.74 meters (*5.7 ft*)
- New multimaterial body with high percentages of ultra high-strength steels and aluminum

### Chassis

- Newly developed front and rear axles, high agility and top ride comfort thanks to low center of gravity and sophisticated technologies
- Electromechanical power steering
- Recuperative brake system
- Audi drive select (dynamic handling system) is standard; adaptive air suspension optionally available

- Hill descent control is standard
- Active engine mounts
- 19-inch wheels and optional 20-inch wheels in e-tron-specific design
- 21-inch wheels optionally available

### **Interior**

- Most spacious interior in the segment, optionally available with sliding seats in the second row
- Wide range of seats, up to climate-controlled customized contour seats with massage function
- Newly developed three-zone, automatic air conditioning with energy-saving heat pump
- Electric preheating/cooling for optimal comfort
- Luggage compartment capacity 650 to 1,835 liters (23.0 to 64.8 cu ft); power tailgate standard

### **Controls**

- Innovative MMI operating concept with free text search, MMI navigation plus with large MMI all-in-touch touchpad
- Operation also via multifunction steering wheel and natural voice control
- Audi virtual cockpit with special displays such as power meter standard; optional head-up display

### **Infotainment and Audi connect**

- Standard with top infotainment system MMI navigation plus with 8.3-inch monitor, LTE module and Wi-Fi hotspot for mobile devices
- Optional Audi phone box for inductive cell phone charging
- Many new Audi connect services, including Audi connect safety & service with automatic emergency call
- Optional Audi smartphone interface for connecting iOS and Android cell phones
- Optional Bang & Olufsen and Bose sound systems with 3D sound and Audi tablet as Rear Seat Entertainment system

### **Driver assistance systems**

- Range of driver assistance systems with numerous new developments; largest range in segment worldwide
- adaptive cruise control with traffic jam assist for slow-moving traffic, predictive efficiency assistant for even lower fuel consumption
- Additional systems such as traffic jam assist, turn assist, collision avoidance assist, cross traffic assist rear and trailer maneuver assist

Full version

## **The Audi Q7 e-tron 3.0 TDI quattro – new SUV expands portfolio of plug-in hybrid models**

**Electric range of up to 56 kilometers (34.8 mi), in 6.2 seconds from 0 to 100 km/h (62.1 mph) and just 1.8 liters of diesel per 100 kilometers (130.7 US mpg) on average – the Audi Q7 e-tron quattro is groundbreaking with respect to dynamics and efficiency. The spacious SUV is the world's first plug-in hybrid with a TDI engine and quattro drive. In every field of technology it showcases Audi's high-tech competence.**

**The Audi Q7 e-tron will be rolling into European dealerships with a generous list of standard equipment in spring 2016. The base price in Germany is 80,500 euros.**

### **Plug-in hybrid drivetrain**

The Q7 e-tron quattro is a highly efficient parallel hybrid. Its 3.0 TDI engine and electric motor achieve system values of 275 kW (373 hp) of power and 700 Nm (516.3 lb-ft) of torque. The sprint to highway speed takes 6.2 seconds, and acceleration continues up to 230 km/h (142.9 mph)

Fuel consumption of the Audi Q7 e-tron according to the ECE standard for plug-in hybrids is just 1.8 liters of diesel per 100 kilometers (130.7 US mpg) – corresponding to CO<sub>2</sub> emissions of 48 grams per kilometer (77.2 g/mi). The SUV covers up to 56 kilometers (34.8 mi) on electricity alone in the NEDC. Together with the TDI engine and its 75 liter tank, it gives the Q7 e-tron quattro a total range of up to 1,320 kilometers (820.2 mi). Audi leads the competition with these values.

### **Top technology: the 3.0 TDI**

Audi uses one of its most modern power units as the combustion engine – the 3.0 TDI. It produces 190 kW (258 hp) and 600 Nm (442.5 lb-ft) of torque, the latter between 1,250 and 3,000 rpm. The V6 diesel is state of the art in every regard. The rings and bolts of the oil-cooled pistons are optimized for minimum friction; the crankcase and cylinder heads have separate coolant loops. The thermal management system provides for high performance and efficiency. The camshafts are particularly lightweight hollow shafts; oil pump operation is fully variable.

The common rail injection system develops a system pressure of 2,000 bar. The emission control components are integrated into the engine package. The large NO<sub>x</sub> storage catalytic converter is directly downstream of the turbocharger's turbine outlet. It is only active at low exhaust temperatures. In most situations, the nitrogen oxides are broken down by the diesel particulate filter with SCR coating. The exhaust gas recirculation (EGR) uses a main and a pre-cooler to cool the recirculated exhaust gas as needed.

One effect of the plug-in hybrid concept is that the 3.0 TDI engine is often only activated in kickdown situations, even when cold and under high loads. Modified cylinder liners and piston rings as well as a sensor that measures the quality of the oil therefore protect the engine. The engine control unit uses a dual-core processor for high computing performance.

With its crankcase of high-strength vermicular-graphite cast iron, the V6 diesel tips the scales at barely more than 190 kilograms (*418.9 lb*). The TDI and eight-speed tiptronic are connected to the subframe of the front axle or the body at five points. Active engine mounts – a global first in a diesel engine – largely eliminate vibrations by utilizing electromagnetic oscillation coil actuators to induce phase-offset counter oscillations. The engine mounts are active while driving with the combustion engine running and at idle.

### **Smooth and fast: the clutch**

The so-called hybrid module is mounted between the 3.0 TDI and the eight-speed tiptronic. Inside it are the electric motor and the K0 clutch, which is directly upstream of the torque converter. When the electromechanically actuated dry-plate clutch opens, it disconnects the diesel engine from the drivetrain. The clutch is smooth and fast, closing in just 80 milliseconds.

The 3.0 TDI harmonizes extremely well with the electric engine, which makes its 350 Nm (*258.1 lb-ft*) of torque almost immediately and holds it constant until roughly 2,550 rpm. Its maximum output is 94 kW. The rotor of the permanently excited synchronous machine revolves around the stator. The external rotor principle provides for high power and torque density. Cooling is integrated into the stator bar.

### **Comfortable and efficient: the eight-speed tiptronic**

The eight-speed tiptronic is a classic torque-converter transmission. It changes gears softly, quickly and spontaneously. Its high gear number allows the engine to operate at the ideal load point, while the spread of 7.1:1 enables a long ratio at the uppermost gear for low rpms and low fuel consumption. The transmission includes an rpm-adaptive mass damper that greatly reduces engine pumping. The 3.0 TDI can be operated at a low engine speed of 850 rpm. The transmission is decoupled from the engine when the Q7 e-tron quattro is stationary.

Another strength of the automatic transmission is its high efficiency. The basic design of the wheel sets and shift elements alone provides for low drag torque and high efficiency. The two oil pumps operate at low pressure; a heat exchanger integrates the transmission into the engine's thermal management system. A hydraulic accumulator safeguards the start-stop function: Technical details such as sophisticated venting make the eight-speed tiptronic capable of off-road use and fording.

The driver of the Q7 e-tron quattro can operate the transmission in the automatic modes D and S or shift manually using the elegant selector lever on the center tunnel console or the shift paddles on the steering wheel. Commands are generally transmitted electrically (shift-by-wire).

### **17.3 kWh of energy: the lithium-ion battery**

The high-voltage battery in the Audi Q7 e-tron quattro is efficiently installed beneath the luggage compartment so that it barely affects the space for luggage. It provides 17.3 kWh of energy at a rated voltage of 308 Volts. Its housing shells are made of robust aluminum sheet or cast aluminum. The large lithium-ion battery, which together with the electronic components weighs 202 kilograms (*445.3 lb*) comprises 168 prismatic cells arranged in 14 modules with 12 cells each. There are seven modules per level.

Cast cooling tubes run below the two levels. The liquid cooling ensures that the battery remains in a suitable temperature range during operation. The Audi Q7 e-tron quattro generally drives on electric power, both at the height of summer and at below-freezing temperatures during the winter.

The battery cooling system, which also covers the charger, forms a separate low-temperature cooling loop. If necessary, it can be connected to the coolant loop for the climate control system or the second low-temperature (LT) loop, which cools the electric engine and power electronics and operates at slightly higher temperatures. A dedicated control unit coordinates all switching actions.

The power electronics under the floor panel of the driver's area convert the direct current from the battery into three-phase current for the electric motor. They also generate the 12 V electricity for the low-voltage consumers on board. The technical concept for the power electronics, which are likewise protected by an aluminum housing, ensures high phase currents and a long service life.

### **Versatile: the charging concept**

The Audi Q7 e-tron quattro comes standard with a universal charging cable that in addition to a graphical display also includes plugs for household and industrial outlets. A cable for public charging columns is also standard. Audi also offers an optional Audi-design charging dock for home garages. The SUV's charging connector is located on the left side. In addition to a status LED, there are also two pushbuttons that allow the customer to choose between immediate charging and timer-controlled charging.

Thanks to the new multi-phase charging technology, a full charge takes only around two-and-a-half hours on a 7.2 kW industrial outlet, or around eight hours on a household outlet depending on the capacity of the charging infrastructure. Audi offers its customers a partnership with the utility LichtBlick SE, whose electricity is generated with 100 percent renewable energies. If the customer opts for "Audi Energy," his or her entire household will be supplied with environmentally friendly electricity.

Audi Q7 e-tron quattro drivers can fill up in Germany with electricity and diesel fuel using the "Audi Charge&Fuel Card," which offers simple billing and attractive, transparent rates. The no-fee card issued by Volkswagen Financial Services is accepted at more than 1,200 public charging stations and over 10,800 gas stations. An app for iOS and Android smartphones shows the way to the nearest station.

The Audi connect portfolio includes special online services that enable drivers to remotely control and operate numerous functions of the Q7 e-tron quattro from their smartphones. For instance, they can call up the car's status – such as the battery's charge status, the electric range, a variety of service information or even its location. Furthermore, drivers have the option of starting and stopping charging or setting the timer to reflect when they next plan to drive the car. In this case, they can specify in detail at what time on what days they want to drive off with the battery fully charged.

### **Comfortable and convenient: preheating and cooling**

Thanks to the electric compressor and the high-voltage electric auxiliary heater, the interior can be cooled down prior to driving in the summer or preheated in winter. The customer can schedule his or her time of departure and drive off immediately thanks to the electric preheating or cooling. The function can be remote-controlled via the MMI in the car or the Audi MMI connect app. Preheating or cooling works regardless of whether the car is connected to the charging infrastructure, provided that the high-voltage battery has a sufficient charge. Audi also offers conventional auxiliary heating.

### **Intelligent: the hybrid management system**

While driving, the hybrid management system controls the operating states of the Audi Q7 e-tron quattro intelligently, flexibly and with high efficiency. The driver can choose between three modes. EV mode prioritizes electric driving, while in hybrid mode the decision regarding the drive type is left largely to the hybrid management system. In battery hold mode, the system stores the available electrical energy.

The spacious SUV generally starts in electric mode. To activate the combustion engine, the driver has to press down on the active accelerator (another innovation from Audi) beyond a certain point of resistance. The point at which this occurs is based on the requirements of the hybrid management system. A pressure point must also be overcome for boosting, in which both the engine and electric motor work together at full power.

S mode of the eight-speed tiptronic is configured for high recuperation rates, with energy recovery beginning as soon as the driver takes his or her foot off of the accelerator. Using the shift paddles on the steering wheel, the driver can change gears to select the degree of recuperation in steps. The recuperative brake system enables a controlled split between the electrified drivetrain and the conventional friction brake. This enables a majority of the energy to be recovered when the car is braked, increasing the electric range of the Audi Q7 e-tron quattro. All light braking actions, which represent the majority during normal driving, are also performed using the electric motor. Changeover occurs with moderate or sharper deceleration, when the hydraulic wheel brakes are used.

If hybrid mode is active, speed is below 160 km/h (99.4 mph) and the eight-speed tiptronic is in mode D, the Audi Q7 e-tron quattro switches to coasting as soon as the driver takes his or her foot off of the accelerator. The TDI and electric motor are deactivated. If the SUV approaches a slower car ahead, a traffic circle or town limits, coasting ends in favor of recuperative braking.

#### **Foresight: the predictive efficiency assistant**

Even if route guidance is disabled, the predictive efficiency assistant uses the route data to alert the driver about situations where it's advisable to slow down. In the Q7 e-tron quattro, this system enables a predictive operating strategy and automated hybrid management. The system recognizes curves, traffic circles and intersections, downhill slopes, town limit or speed limit signs – in many cases long before the driver sees them. A corresponding “foot from gas” message then appears in the instrument cluster or Audi virtual cockpit as well as in the optional head-up display. If the assistant screen is active, detailed graphics can be seen. If the driver wishes, the system itself will control the freewheeling function of the eight-speed tiptronic within certain parameters (in terms of speed and accelerator pedal gradient), so that the new Audi Q7 e-tron quattro will roll at idle toward the slow-driving zone, such as at a traffic circle.

In combination with the predictive efficiency assistant, speed is automatically adjusted when entering built-up areas and to observe speed limits as well as on bends and at intersections, also when using coasting mode.



The data provided by the standard MMI navigation plus, the front-facing camera (also standard) and the radar sensors of the optional adaptive cruise control are used to recognize the traffic situation. The predictive efficiency assistant evaluates these data for the hybrid management system.

Even before starting out, the system computes the ideal hybrid strategy – even over longer distances – with consideration of real-time traffic information from the MMI navigation plus. Underway, the predictive efficiency assistant generates a detailed image of the route to a distance of three kilometers (*1.9 mi*).

On approaching speed limit and town signs, bends, traffic circles and intersections, the system visually signals the driver to release the accelerator pedal. At the same time, the active accelerator pulses once against the sole of his or her foot.

Thanks to its hybrid drive, the new Audi Q7 e-tron quattro also leaves a good environmental footprint. The computational consideration of its life cycle – from obtaining the raw materials through production to recycling after 200,000 kilometers (*124,274.2 mi*) – yields a total CO<sub>2</sub> equivalent which, if run on Audi Energy, is 41 percent below the figure for the diesel-powered counterpart. The figures are slightly higher in production due to the energy input for the battery materials, but after around just 37,000 kilometers (*22,991 mi*) (renewable electricity generation – Audi Energy) the new Q7 e-tron quattro outpaces a pure diesel vehicle in terms of its environmental footprint.

### **quattro drive and chassis**

The self-locking center differential of the quattro permanent all-wheel drive is integrated into the housing of the eight-speed tiptronic. Lightweight and compact, its optimized locking range provides for excellent traction and handling characteristics. Under normal driving conditions, the center differential distributes the power between the front and rear axle in a 40:60 ratio.

If the wheels of one axle lose traction, the purely mechanical component can redistribute the power with no delay – up to 70 percent to the front and a maximum of 85 percent to the rear. The self-locking center differential works closely with the wheel-selective torque control. During fast cornering, the control software uses finely modulated interventions to brake the inside wheels, which are under a reduced load. This makes the SUV's self-steering behavior even more agile and precise, and the grip even better.

### **Sporty agility and top comfort: the chassis**

The Q7 e-tron quattro handles highway runs comfortably and with aplomb. It masters winding interurban roads with precision and agility. Compared with the previous generation of the Q7, its center of gravity has been lowered by 50 millimeters (*2.0 in*), in part due to the lower installed position of the engine.

The SUV's chassis is over 100 kilograms (*220.5 lb*) lighter, with the axles alone accounting for 60 kilograms (*132.3 lb*). Redesigned five-link constructions of aluminum and high-strength steel guide the wheels front and rear.

The pivot bearings are forged aluminum; the propshafts of the front axle are hollow. The elastomer bearings and the separate springs and dampers at the rear axle respond extremely sensitively.

Audi offers the adaptive air suspension – a pneumatic suspension with adjustable damping – as an option. It is managed via a newly developed chassis control unit that controls all the body control systems in the Audi Q7 e-tron quattro. The system varies the body's ride height depending on the situation. On the highway, the body is lowered by as much as 30 millimeters (*1.2 in*), which improves stability and the flow of air around the car. When driving slowly off-road, ground clearance increases by up to 60 millimeters (*2.4 in*). Sports suspension is also available as an option.

The electromechanical power steering is very efficient. It provides a direct, precise steering feel and works closely with several driver assistance systems. Its servo boost adapts to the driving speed.

A central control unit called ECP (Electronic Chassis Platform), which governs all body control systems, regulates the operation of the shock absorbers within milliseconds for each wheel individually, for example. Electromagnetically actuated valves inside vary the flow of hydraulic fluid – this concept allows an especially large spread between sporty and comfortable rolling. The position of the car relative to the horizon in the lateral and longitudinal directions is computed in the ECP and shown on a display in the MMI.

### **Up to seven modes: Audi drive select dynamic handling system**

Audi drive select, the standard dynamic handling system, incorporates multiple technical components, including the eight-speed tiptronic, electromechanical power steering, the engine characteristic and the engine sound of the 3.0 TDI. It also controls the optional adaptive air suspension. If the car is equipped with the air suspension, Audi drive select offers seven modes: efficiency, comfort, auto, dynamic, individual, allroad and lift/offroad.

The Q7 e-tron quattro comes from the factory equipped with standard 19- or optional 20-inch wheels with an e-tron specific design and 255/55-series tires. Audi also offers 21-inch wheels.

Large, internally ventilated discs with a diameter of 400 millimeters (*15.7 in*) up front stop the SUV safely and reliably. They are gripped by six-piston aluminum calipers. The electromechanical parking brake features convenient hill hold and startup functions.

Off-road, the Audi Q7 e-tron quattro benefits from its high ground clearance (up to 245 millimeters (*9.6 in*)) and the greatest possible axle twist. An optional display presents the pitch and body roll angle; standard electronic hill descent control maintains the desired speed. An off-road mode for the electronic stabilization control ESC is also standard.

### **Body and exterior design**

The Audi Q7 e-tron quattro is 5.05 meters (*16.6 ft*) long, 1.97 meters (*6.5 ft*) wide and 1.74 meters (*5.7 ft*) tall (with steel springs). Its wheelbase measures 2.99 meters (*9.8 ft*). Despite these generous dimensions, its curb weight is just 2,445 kilograms (*5,390.3 lb*). 375 kilograms (*826.7 lb*) thereof is attributable to e-tron specific equipment, such as the high-voltage battery, the electric motor and the power electronics. 35 kilograms (*77.2 lb*) is due to standard equipment: wheels, 24 liter (*6.3 US gal*) AdBlue tank, three-zone automatic air conditioning, heat pump. Modifications to the brakes, axles and body due to the vehicle's higher performance account for 40 kilograms (*88.2 lb*).

The body plays a decisive role in the relatively low curb weight of the Audi Q7 e-tron quattro. Lightweight construction measures touch every area, from the electrical system to the seats. The key factor, however, is the body structure. A new multimaterial construction principle reduces its weight by 71 kilograms (156.5 lb) compared with the previous model series.

Ultra-high-strength parts made of hot-shaped steel form the backbone of the occupant cell. Aluminum castings, extruded sections and panels are used in the front and rear ends as well as the superstructure, comprising 41 percent of the body structure. Also made of aluminum are the doors, which shave 24 kilograms (52.9 lb) of weight, the front fenders, the engine hood and the tailgate.

Three torsion rings reinforce the front end, the area of the C-pillars and the tailgate cutout. They contribute significantly to the body's greatly improved rigidity, thus providing the foundation for the precise road behavior and superior vibration comfort in the interior.

Crash safety and occupant protection are also on the highest level. The Audi Q7 e-tron quattro has a drag coefficient of just 0.34. Its underfloor is nearly completely lined; a small spoiler in the area of the rear axle reduces lift. Even the acoustic insulation is very sophisticated. The interaction of various vehicle components such as the exterior mirrors and the seals result in the best aeroacoustics in the class.

### **Masculine look: exterior design**

The design of the Audi Q7 e-tron quattro is masculine and determined – all lines and surfaces emphasize the width and solidity of the spacious SUV.

The three-dimensional Singleframe grille with the wide frame is organically integrated into the front end. Led headlights are standard; Audi optionally offers Matrix LED technology, which enables millions of light distribution patterns. The daytime running lights are in the form of a double arrow, and the rear lights include dynamic turn signals, another Audi innovation. Three aluminum-look crossbars divide the air inlets to form the typical e-tron signature.

Horizontal lines above the wheels, called blisters, recall the classic quattro models from Audi. The exterior mirrors are mounted on the shoulders of the doors; the blades in the lower section of the doors bear embossed quattro logos.

The tailgate wraps around the massive, steeply raked D-pillars, a typical feature of the Q models from Audi. The standard 19-inch wheels are monochrome, the 20-inch wheels partly polished. Their e-tron-specific design offers little wind resistance.

### **New look: trim strips and add-on parts**

The trim strips of the Audi Q7 e-tron quattro are finished in matt aluminum-look; with its structure, the finish on the grille of the Singleframe underscores the SUV's off-road character. Add-on parts such as the door blades and underbody protection up front are silver; as an option, the bottom sections of the bumpers and the wheel arches are painted in the body color. There is a choice of 11 exterior colors.

### **Interior**

The Audi Q7 e-tron quattro offers the longest interior in its class, with luxurious head, shoulder and knee room. The three seats in the second row come standard with adjustable backrests; optionally all three seats can slide forward or backward by up to 110 millimeters (*4.3 in*). Isofix-/i-Size fixtures for child seats are standard; roller shades and dark privacy glazing are optionally available for the rear. The panoramic glass sunroof, another option, brings even more light and air to the interior.

The luggage compartment has a capacity of 650 liters (*23.0 cu ft*) in the standard configuration. With the rear seats folded down, this increases to 1,835 liters (*64.8 cu ft*). An electric drive for the tailgate is standard; in combination with the convenience key there is also gesture control: the tailgate opens and closes when the owner makes a kicking motion beneath the bumper. Audi also offers a power luggage compartment cover, a rail system with load-securing kit and power door closers as options.

### **Broadly stretched lines: interior design**

The controls are rimmed with fine aluminum lines and are perfectly coordinated with the architecture of the interior. The instrument panel is visually separated from the center console. This solution underscores the elegant spaciousness. Stretching in a big arc between the front doors and below the windshield is the wrap-around.

The front seats offer a lot of space and comfort. Like the rear seats, they are very lightweight. Audi offers them in numerous variants, including multiway adjustable sport seats and fully climate-controlled, customized contour seats with up to 18 adjustment possibilities. Their optional massage function includes five programs and five intensity levels.

**Newly developed: automatic air conditioning with heat pump**

Audi delivers the hybrid SUV with a newly developed, three-zone automatic air conditioning system. A black TFT display, which indicates the status of key functions, imbues its control panel with a sophisticated look. The capacitive toggle switches below together with the animated graphics in the display facilitate operation. Temperature displays are integrated directly into the rotary control, and a display with capacitive toggle switches shows the status of important functions. In the right zone of the instrument panel is a continuous air vent strip that discharges the air indirectly and draft-free. Rear passengers have their own control panel.

The automatic air conditioning in the Audi Q7 e-tron quattro is supplied by a heat pump, a technology not found in any other plug-in hybrid car. It systematically collects the waste heat from the high-voltage components of the electric drivetrain and uses a coolant loop to bring it to an appropriate temperature. Heat pump technology makes it possible to use this waste heat to heat or cool the interior.

The heat pump is impressively efficient: its electric-powered compressor produces up to three kilowatts of thermal output from just one kilowatt of electric power. Compared with a conventional air conditioning system, it expands the electric range of the Audi Q7 e-tron quattro by around six kilometers (3.7 mi). For operation at very low outside temperatures, the SUV also has a powerful, high-voltage electric auxiliary heater on board. Audi also offers a classic auxiliary heater.

### **Colors and materials: maximum individuality**

The colors and materials in the interior are a new, modern expression of lightness, sportiness and comfort. There is a choice of seven colors. The instrument panel is two-tone: darker in the upper section and lighter in the lower. The two-piece application strips – a feature from the luxury class – are also available in various combinations. Besides sophisticated effect finishes, there is also a choice of multiple aluminum and wood variants, including layered Beaufort walnut. Audi offers a choice of fabric, Alcantara, robust Cricket leather and fine Valcona leather for the seat coverings.

Customers looking for even more individuality can choose from three leather packages, six leather upholstery and trim options and the Audi design selection. This includes a full-leather interior with contrast stitching, an Alcantara headlining, luxury velour floor mats and exclusive color and material combinations. The Audi Q7 e-tron quattro can be personalized even further with the Audi exclusive program.

Even the interior lighting reflects the style and luxury of the Audi Q7 e-tron quattro. With ambient lighting, ultra-narrow light guides follow the contours of the instrument panel, in the doors and on the tunnel of the center console. The MMI control system is used to control the lighting according to multiple profiles and zones, as well as to switch between 32 colors. These vary depending on the mode set in Audi drive select.

### **Controls and infotainment**

The numerous convenient and innovative functions of the Audi Q7 e-tron quattro can be easily controlled using the latest infotainment system included as part of MMI navigation plus. Its logic follows the concept of modern smartphones – flat hierarchies replace complex menu trees. Two supplemental menus include intelligently linked functions and options. Nearly all entries can be made in just a few steps. With MMI search, it is usually enough to enter just a few characters. Audi has once again set a new standard in the SUV segment with this free text search.

The infotainment has been expanded to include essential e-tron displays. Consumption statistics are available, for example, and electric range is displayed graphically in the navigation map. Both charging and preheating/cooling can be time-controlled to take place before the drive, and they are adapted to customer's wishes (departure time, etc.) so as to save resources and costs.

### **Haptic feedback: MMI all-in-touch**

The heart of the operating concept is the standard MMI all-in-touch terminal. The driver can input characters, scroll and zoom on its touch surface of dark, real glass with his or her wrist resting comfortably on the selector lever of the eight-speed tiptronic. Each click is followed by a haptic confirmation – a click the finger can feel. Supplementing this is the large rotary/push-button, two rocker switches for choosing the most important contextual menus and eight freely programmable favorites buttons.

The control logic of the Audi MMI is also reflected in the multifunction steering wheels. Drivers can operate the onboard computer, audio system, telephone and MMI navigation plus with the thumb of their left hand. Located on the right steering wheel spoke are the volume roller, the voice control button, express telephone controls and the skip function for quickly changing the radio station or song.

The voice control system understands formulations from everyday speech. In the "Telephone" menu, drivers can call a contact, for example, by saying "I want to talk to Peter Meier." The navigation system also responds to natural speech commands ("Where can I get gas?"); the same is also true for the "Radio" and "Media" menus ("I want to listen to my iPod").

### **Sophisticated graphics: Audi virtual cockpit**

The Audi virtual cockpit is standard in the Q7 e-tron quattro. The high-resolution, 12.3-inch TFT monitor displays richly rendered, tack-sharp graphics. Its most important component is a Tegra 30 processor from Audi's partner Nvidia. This is a quad-core chip that can process up to eight billion operations per second.

The driver can use the multifunction steering wheel to switch between views. The dial instruments – speedometer and the e-tron-specific power meter – dominate in classic mode. In the infotainment view the dial instruments are smaller. Between them is a large stage for maps and lists.



Rounding out the spectrum are special displays about the hybrid drivetrain, including consumption statistics and a combined graphical range indicator with separate figures for the electric motor and combustion engine.

The head-up display constitutes another display level. Harmoniously integrated into the instrument panel, the optional display projects all key information onto the windshield.

### **Sound with a third dimension: 3D sound**

Audi offers a choice of two innovative sound systems for particularly discriminating hi-fi fans. In the Bang & Olufsen Advanced Sound System, the digital signal processor drives 11 channels with a total of 23 speakers in such a way that the sound is equally precise and harmonious in every seat. Four speakers installed in the A-pillars and driven via separate channels broadcast those elements that generate the spatial height, creating a big virtual stage. Newly developed speakers and an amplifier with 1,920 watts guarantee musical enjoyment at the highest level. The Bose Surround Sound system, which generates the surround sound with 19 speakers, also features two speakers located higher up in the A-pillars to generate the third dimension of the sound.

### **Infotainment**

The Audi Q7 e-tron quattro comes standard with MMI navigation plus. Working in the background of MMI navigation plus, which works closely with many assistance and safety systems in the Audi Q7 e-tron quattro, is the second-generation Modular Infotainment Platform. Its most important component is the Nvidia Tegra 30 processor. It is integrated into the MMX board (Multi Media eXtension), which is designed as a plug-in module. Audi can keep it at the state of the art throughout the entire development process and thus bring the latest developments in consumer electronics to the automobile.

MMI navigation plus includes a DVD drive, two card readers, flash memory, the Audi sound system, the Audi music interface with two USB ports, a Bluetooth interface and a high-resolution, 8.3-inch monitor, which rises electrically from the instrument panel when the system is started. The high-end media center enables access to the smartphone's voice control system, displays emails from the mobile phone and reads them aloud.

It also brings the Audi smartphone interface to the Q7 e-tron quattro. The Audi smartphone interface brings Apple Car Play and Google Android Auto on board. If an iOS or Android mobile phone is connected to the USB port (iOS from Version 7.1; Android from Version 5.0 Lollipop), the respective environment tailored for use in the car opens in the Audi smartphone interface. At the heart of the system is online music, but it also offers appointment reminders, navigation and messaging functions. The offer will continue to expand through 3rd party apps such as Pandora, Spotify and WhatsApp.

Another infotainment feature is the optional Audi phone box, which makes using the mobile phone even easier. It connects it wirelessly to the SUV's mobile radio antenna. It also charges the phone inductively, if necessary.

In addition, the optional Audi tablet with a 10.1-inch display is available as an innovative, highly flexible Rear Seat Entertainment system for the rear passengers. The particularly elegant and robust tablet connects to MMI navigation plus over WiFi. Its user can thus send a navigation destination from the rear seat to the MMI navigation plus, select a radio station or use the Audi connect WiFi hotspot to surf. The Audi tablet also provides access to the complete world of the Android operating system. Upon arriving, the passengers can remove the Audi tablet from its mount on the seat and take it with them.

### **Audi connect**

MMI navigation plus also includes the module Audi connect, which connects the Audi Q7 e-tron quattro to the internet via the LTE standard. The driver can use the tailored Audi connect services – from online traffic information to navigation with Google Earth and Google Street View to online media streaming – free of charge for three months. The new Audi MMI connect app provides access to Aupeo! personal web radio and the large Napster music library. The usual information services such as weather, news and gas stations prices are also available. Free online updates of the navigation map are available every six months. Passengers can surf the web and send emails via a Wi-Fi hotspot.

### **Audi connect: new services**

Services under the name “Audi connect safety & service” are a new part of the standard range. Audi offers emergency calling, online roadside assistance and Audi Service scheduling online in the “myService” package. These services may be used free of charge for ten years. The “myCarManager” package bundles additional functions (free of charge for three years). These include a vehicle status report, remote control locking and unlocking, display of the park position and duration, and remote control of the optional auxiliary heater. Operation is via the MMI connect app on a smartphone.

### **Driver assistance systems**

With its range of driver assistance systems, the Audi Q7 e-tron 3.0 TDI quattro sets standards that go far beyond the standards in its segment. Some of them have been completely redesigned; others significantly further developed.

Standard are the predictive efficiency assistant, the rear park assist, cruise control, adjustable speed limiter, attention assist and the safety system Audi pre sense city. At speeds up to 85 km/h (*52.8 mph*) it warns the driver of impending collisions with pedestrians and will initiate heavy braking in an emergency. Up to the top speed of 230 km/h (*142.9 mph*) it warns of impending collisions with other vehicles.

If the collision is inevitable, the multicollision brake assist system uses controlled braking maneuvers during the accident to aid the driver. This can help to prevent the car from skidding and thus additional collisions. Another standard system, Audi pre sense basic, initiates preventive measures to protect the driver and passenger in unstable driving situations.

Most optional driver assistance systems are bundled in the packages “Parking,” “City” and “Tour.” One of the new systems in the “City” package is cross traffic assist rear. Together with the park assist, it can warn the driver of crossing traffic when the Q7 e-tron quattro is pulling slowing out of a horizontal parking spot, for example. The exit warning system indicates vehicles or cyclists approaching from the rear when opening the door.

Audi side assist (also available separately) uses radar measurements to assist with changing lanes; Audi pre sense rear tensions the seat belts in the event of an impending collision from behind. The parking system plus and the reversing cameras complete the “City” package. Audi offers the park assist as individual option. This backs the car virtually autonomously into parallel and perpendicular parking spots. The car can forward-exit parallel parking spaces and now also drive forward into perpendicular spaces. This system is also available together with the 360 degree cameras in the “Parking” package.

If the SUV is used as a tow vehicle, the trailer maneuver assist steers the trailer backwards in the direction indicated by the driver using the rotary/push-button of the MMI. It also manages turning the steering wheel in the opposite direction and stabilizes the trailer when driving straight ahead. The system is available in combination with the power trailer hitch. The Audi Q7 e-tron quattro has a towing capacity of 3.5 metric tons if equipped with the optional air suspension.

**For slow-moving traffic: ACC stop & go including traffic jam assist**

The “Tour” package includes additional innovations: The adaptive cruise control (ACC) accelerates and brakes to keep the Audi Q7 e-tron quattro at the desired distance from the vehicle ahead. The new traffic jam assist comes into play on well-paved roads. The system takes over the steering as long as traffic is congested and moving at speeds of no more than 65 km/h (*40.4 mph*).

The safety system Audi pre sense front warns of an impending rear-end collision with the vehicle ahead, tensions the belts and brakes the SUV autonomously, if necessary. It does both of these things in multiple stages. Audi active lane assist (also available separately) uses slight steering interventions to help drivers stay in their lane at speeds of 65 km/h (*40.4 mph*) and above.

The collision avoidance assist intervenes in the steering to help the driver avoid an obstacle. The turn assist monitors opposing traffic when turning left at low speeds, braking the car in a critical situation. Camera-based recognition of traffic signs (also available separately) rounds out the “Tour” package.

The night vision assistant is available as a stand-alone module. It can detect pedestrians and larger wild animals at long distances in the dark using an infrared camera and issue appropriate warnings to the driver.

## **Fuel consumption of the models named above:**

### **Audi Q7 e-tron 3.0 TDI quattro:**

Combined fuel consumption in l/100 km: 1.9 – 1.8\*\* (*123.8 – 130.7 US mpg*);

Combined electrical power consumption in kWh/100 km: 19.0 – 18.1\*\*;

Combined CO<sub>2</sub> emissions in g/km: 50 – 48\*\* (*80.5 – 77.2 g/mi*)

\*\*Fuel consumption, CO<sub>2</sub> emission figures and efficiency classes given in ranges depend on the tire/wheel sets used.