



Corporate Communications

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Road map E: Audi in the era of electric mobility

Ingolstadt, September 23, 2019 – Audi is transforming into a provider of electric mobility—a process that involves all areas of the company. After all, the brand with the four rings intends to put more than 30 electrified models on the market by 2025, which constitutes a 40 percent share in sales. In doing so, Audi is consistently pursuing the path of sustainable mobility. Accordingly, the areas of Procurement and Production are also aligning themselves more strongly with sustainability-related criteria. The skills and experiences from the development and production of the Audi e-tron* will be incorporated into the upcoming projects for the all-electric models. The activities are flanked by comprehensive training and development concepts.

Consistently electric

Audi is becoming a provider of integrated, carbon-neutral premium mobility with the goal of taking the leadership role in the competition. To this end, the manufacturer is accelerating its electrification road map and company-wide decarbonization. By 2025, the carbon footprint of the vehicle fleet across the entire life cycle is to be reduced by 30 percent as compared to 2015. In the future, the return on investment as the central financial control parameter will also show the CO₂ performance of the four rings, with sustainable management helping to increase it to more than 21 percent.

In the context of the Volkswagen Group's consistent focus on electric mobility, the four rings are taking a targeted approach to aligning their drive portfolio with the specific requirement profiles of premium customers. With a considerable portion of large vehicle segments, the corresponding power requirements and frequent use for long-distance journeys, Audi is relying on plug-in hybrid drives in addition to all-electric vehicles.

Consistently customer

Modern premium customers are increasingly placing their focus on sustainable mobility. It is therefore a consistent step to make electric mobility one of the central cornerstones of the new brand strategy. Audi will reserve 50 percent of its marketing budget for topics relating to electric mobility in the future. The company aims to provide its customers with a stronger emotional experience with the new drive type, dispel any reservations and spark enthusiasm. The company podcast "The Future Is Electric," which is now already on its second season and recently won the "World Media Award" in the "Automotive" category, is a successful example of this approach. Audi also started a new chapter for the market launch of the e-tron* at the beginning of 2019 with a walk-on meteorite at Munich Airport. Visitors had the opportunity to spontaneously experience the new model and the Audi brand on more than 20,000 test drives.

* The fuel consumption values of all models named and available on the German market can be found in the list provided at the end of this MediaInfo.



The brand's trade partners all over the world are crucial ambassadors of the new technology. In order to get their businesses ready for the e-tron*, the dealers have already been installing the suitable charging infrastructure for many months. Audi has trained more than 9,500 international dealership employees for the market introduction of the Audi e-tron*. In order to ensure optimum service, the brand with the four rings is relying on innovative virtual reality (VR) technology: Service technicians in more than 40 markets are using a specially developed VR training course to familiarize themselves with the details of the high-voltage battery in the Audi e-tron*.

Aside from the product itself, experiencing the brand is becoming increasingly important for premium customers. This applies for electrified models in particular, as the ecosystem of the vehicle plays a decisive role here. The company is therefore offering its customers the Audi e-tron Charging Service. It provides access to around 80 percent of all charging stations in Europe—more than 110,000 public charging points in 20 EU countries that are operated by 220 providers. Whether AC or DC, 11 kW or 150 kW—a single card is all customers need to start the charging process. Billing is automatic via the user account. With the new Plug & Charge function that will be released shortly, the Audi e-tron* authorizes itself at the charging terminal via cryptographic processes automatically and activates it.

To charge their vehicles at home, Audi customers can supply their homes and garages with “Volkswagen Naturstrom”, which is generated from 100% renewable energy sources. If desired, the local Audi service partner will send an electrician to check the power supply in the customer's garage and install a charging connection.

The optional charging system connect, which can fully charge the battery of the Audi e-tron* in just over four hours, provides intelligent functions in connection with a home energy management system: The Audi e-tron* can be charged with the maximum power available while taking the needs of other consumers in the household into consideration to avoid overloading the power supply of the home. Customers can also define individual priorities, such as charging when electricity is less expensive. If the home is equipped with a photovoltaic system, the car can be charged primarily using the electricity generated by the system, and the charging management even considers forecast phases of sunshine.

Cross-brand goal: a comprehensive charging infrastructure

From the customer's garage and the cooperation with Ionity to the entire power grid: The Volkswagen Group founded the European direct current fast charging network Ionity together with Audi and Porsche, BMW, Daimler and Ford in 2017. By 2020, there are to be 400 high-power charging (HPC) stations no further than 120 kilometers (74.6 mi) apart in 25 countries. In addition to its involvement in the Ionity group, Audi is also carrying out initial model tests of development and partnerships for offerings with energy groups and public utility companies in order to offer BEV customers a reliable and comprehensive mobility offer with the supply of green energy. Charging management that supports the local network rather than overloading it is an important element in Audi's electric mobility ecosystem. Together with energy suppliers and energy service providers, the brand is investigating the potential of intelligent home networks and “smart grids” that will turn the e-tron* models into players on the field of the energy transition. An initial model test has already yielded promising results, including with a view to the customer's cost calculation.

** Fuel consumption and CO₂ emission figures given in ranges depend on the tires/wheels used as well as the selected equipment*



Sustainability along the value chain

With its company-wide sustainability road map, Audi has set itself the goal to successively decarbonize the entire vehicle life cycle, from the supply chain and production to the use and utilization of the Audi models.

Furthermore, Audi has a clear mission to achieve company-wide carbon neutrality on balance by 2050.

The supply chain plays a crucial role in Audi's sustainability road map, especially when it comes to electric cars. The company is therefore intensifying its efforts to enter into a dialog with its partners with the aim of jointly reducing the CO₂ emissions along the entire value chain considerably. At the end of 2018, Audi launched the CO₂ program in Procurement and has since carried out more than 30 CO₂ workshops with suppliers. The first results show that the partners can reduce emissions in particular by closing materials cycles and using green electricity and a larger amount of secondary material and recyclates. Initially, the focus is on parts that involve particularly energy-intensive production. These include, for example, HV batteries and aluminum components. Audi is therefore already demanding that its battery cell suppliers use green electricity in cell production and has anchored this requirement in its specifications.

The premium carmaker is also campaigning for the sustainable treatment of aluminum. Audi was the first automotive manufacturer to be awarded the "Performance Standard" certificate by the Aluminium Stewardship Initiative, which has created a comprehensive sustainability standard, in October 2018. It certifies that the aluminum components of the battery housing in the Audi e-tron* are manufactured and installed in accordance with the ASI sustainability requirements. Audi also intends to enter into targeted cooperations with partners who are also certified by the ASI. For example, aluminum manufacturer Hydro has already been supplying sustainable, ASI-certified aluminum for the battery housing of the first fully electric Audi model since July 2019. As of the end of 2019, Hydro will supply only aluminum sheets that are certified by ASI for the Audi e-tron*.

In addition, Audi is reducing the CO₂ emissions when using aluminum by reusing the material in accordance with the circular economy principle. The company already introduced an "Aluminum Closed Loop" at the Neckarsulm location back in 2017. The aluminum sheet offcuts that are produced in the press shop are sent straight back to the supplier, who recycles them. Audi then reuses these reprocessed aluminum sheets in its production process. In doing so, Audi saved around 90,000 metric tons of CO₂ in 2018 alone—30 percent more than the previous year. As of 2020, Audi will gradually roll out the Aluminum Closed Loop in other plants.

In order to ensure sustainability in the supply chain with even greater efficiency, the brand with the four rings already introduced a sustainability rating in 2017. It is used to assess whether the supplier adheres to social and environmental standards. In addition to a self-disclosure, the rating can also perform an on-site check. Since July 2019, the sustainability rating (S rating) has also included a compliance check. The S rating has also been a mandatory contract award criterion since then. This means that suppliers will receive an order only if they verifiably meet specific social, environmental and compliance standards. The rating will be rolled out in the entire Volkswagen Group.

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Audi is also involved in various initiatives, thereby campaigning for the preservation of human and environmental rights in the supply chain together with other partners. For example, Audi is a member of the Global Battery Alliance. It is concerned with the protection of human rights and social standards for the mining of raw materials for batteries and develops solutions for the reuse of lithium-ion batteries.

Carbon-neutral production

Audi also considers the carbon-neutral production of electric cars to be an important element of sustainable mobility. The Brussels plant plays a pioneering role here: It has already been carbon-neutral since the start of production of the Audi e-tron*. This was achieved by converting to green electricity, a step that the location already took in 2012, and by installing the largest photovoltaic system in the region. The Audi plant in Brussels meets its heating requirements with certificates for biogas. Overall, the plant saves up to 40,000 metric tons of CO₂ emissions per year by using renewable sources of energy. The measure package is rounded off by compensation projects for emissions that cannot yet be avoided. The company is now rolling out this strategy comprehensively: By 2025, all Audi plants are to be completely carbon-neutral.

Reuse and recycling of batteries

Audi and Volkswagen are already in the process of developing concepts for handling used high-voltage batteries. If a battery has lost a certain percentage of its charging capacity over the course of several years, it can still be used for a stationary application. Among the many available possibilities here, Audi is currently testing two as part of pilot projects: use in forklift trucks and tractor units at the main plant in Ingolstadt and use of the batteries as stationary energy storage on a campus in Berlin.

The first phase of a strategic research cooperation, as part of which Audi and Belgian recycling and materials technology specialist Umicore developed a closed circuit for the elements of HV batteries, has already been completed. The aim is to salvage valuable materials such as cobalt and nickel and use them in new HV batteries.

Maximum flexibility: the production of the electrified models

The brand with the four rings entered the electric era with the start of production of the Audi e-tron* in the Brussels plant. The tradition-steeped production site was first extensively modernized and is now one of the most modern production sites for electric models in Europe. The electric drives are supplied by Audi's own engine production plant in Győr, and the Brussels location has set up its own battery manufacturing facility. Many experiences from the production of the e-tron* in Brussels are now being incorporated in the new BEV projects and the establishment of further production sites for electric vehicles.

For the production of future electric models, Audi is relying on a high level of flexibility and valuable synergies within the Group: For example, the PPE platform (Premium Platform Electric) for the large electric cars was developed in cooperation with Porsche. The aim is to produce the PPE models at existing locations. The vehicle concept is based on the standardized plant structures and can be transferred to other factories quickly.

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Audi is also relying on synergy effects for the smaller models on the basis of the MEB platform (modular electrification platform): The production model of Audi Q4 e-tron concept, an electric SUV in the A segment, will roll off the assembly line at the Volkswagen plant in Zwickau, together with models from the VW and SEAT brands. Bundling the platforms in production this way enables the future large-volume electric models to be produced in large quantities and with great efficiency. The most important parts of the MEB models are made in the Group's component plants, mainly in Kassel (drive modules), Salzgitter (electric motor parts) and Brunswick (batteries and suspension parts).

Preparations for the production model of Audi e-tron GT concept, which will roll off the assembly line in the Böllinger Höfe near Neckarsulm together with the Audi R8 as of the end of 2020, are also already underway. While the high-performance sports car with a combustion engine is still made predominantly by hand, the electric Gran Turismo is to be manufactured with a higher degree of automation in the body shop. Both models pass through the same assembly, which is currently being expanded by 20 cycles to 36 cycles, as well as an overhead conveyor. Specific electric elements of the vehicle, such as the battery system, the drive or the thermal management, are prepared in special pre-assemblies and installed on the assembly line as a finished module.

The plug-in hybrids are produced in the same locations as their respective product lines: For example the Audi Q5 TFSI e* in San José Chiapa (Mexico) and the Audi A7 TFSI e* in Neckarsulm. Audi is currently making two electrified models in local production in China: the A6 L e-tron and the Q2 L e-tron; the Audi e-tron will follow as of 2020.

With the flow: Bringing the employees along on the way to e-mobility

Audi is also making extensive investments in electric mobility in the Human Resources area. The company is bringing further experts on board while also expanding its internal expertise and getting the Audi employees ready for this field of the future. For example, the budget for further education was increased by just over one third, from EUR 60 million to 80 million per year.

Together with Technische Hochschule Ingolstadt (Technical University of Ingolstadt, THI), Audi has designed a training course in electric mobility for powertrain developers. Audi engineers are expanding their knowledge in the field of electric mobility in the THI auditorium. The aim is to enhance their strategic and technical skills. Specialists and education experts from the automotive manufacturer worked together with professors from THI and tailored the in-service qualification specifically to the company's requirements. On-site events and self-learning phases alternate over a period of three-and-a-half months. The timetable for the Audi powertrain developers includes modules such as "electric motors and performance electronics" or "concepts of electrified vehicles and energy storage." The first participants from powertrain development completed the training at the beginning of 2017.

Audi is also making a consistent move toward electric mobility in its youth talent programs. For example, the company is constantly adapting its training to technological progress and developing new job profiles when necessary. The job profile "Qualified electrician with a focus on system and high-voltage technology" was introduced in 2014. Since then, roughly 700 young men and women have started or completed this three-

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year apprenticeship at the locations in Ingolstadt and Neckarsulm. After completing the apprenticeship, they usually work in different areas of production, for example in data analysis, or they apply their skills in one of the Technical Development or Pre-Series Center workshops. The new qualification “Qualified electrician for battery technology” was introduced in 2018. Here, the focus is on the production and quality assurance of high-voltage batteries. No matter whether it is an apprenticeship or further training whose course is set for electric mobility: The international Audi locations are always on board, too, and the special training and development offers are adapted to country-specific features as necessary.

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Fuel consumption of the models listed

(Fuel consumption, electricity consumption and CO₂ emissions figures given in ranges depend on wheels/tires and the chosen equipment level)

Audi e-tron 55 quattro:

Electricity consumption combined in kWh/100 km: 26.2 – 22.6 (WLTP); 24.6 – 23.7 (NEDC)

CO₂ emissions combined in g/km: 0

Audi A7 55 TFSI e quattro:

Combined fuel consumption in l/100 km: 2.1–1.9 *(112.0–123.8 US mpg)*;

Combined electrical consumption in kWh/100 km: 18.1–17.5;

Combined CO₂ emissions in g/km: 48–44 *(77.2–70.8 g/mi)*

Audi A8 L 60 TFSI e quattro:

Combined fuel consumption in l/100 km: 2.7 – 2.5 *(94 – 87.1 US mpg)*;

Combined electrical consumption in kWh/100 km *(kWh/62.1 mi)*: 21.2 – 20.9;

Combined CO₂ emissions in g/km: 61 – 57 *(98.1 – 91.7 g/mi)*

Audi Q5 55 TFSI e quattro:

Combined fuel consumption in l/100 km: 2.4–2.0 *(98–117.6 US mpg)*;

Combined electrical consumption in kWh/100 km: 19.1–17.5;

Combined CO₂ emissions in g/km: 53–46 *(85.3–74.0 g/mi)*



The specified fuel consumption and emission data have been determined according to the measurement procedures prescribed by law. Since 1st September 2017, certain new vehicles are already being type-approved according to the Worldwide Harmonized Light Vehicles Test Procedure (WLTP), a more realistic test procedure for measuring fuel consumption and CO₂ emissions. Starting on September 1st 2018, the New European Driving Cycle (NEDC) will be replaced by the WLTP in stages. Owing to the more realistic test conditions, the fuel consumption and CO₂ emissions measured according to the WLTP will, in many cases, be higher than those measured according to the NEDC. For further information on the differences between the WLTP and NEDC, please visit www.audi.de/wltp.

We are currently still required by law to state the NEDC figures. In the case of new vehicles which have been type-approved according to the WLTP, the NEDC figures are derived from the WLTP data. It is possible to specify the WLTP figures voluntarily in addition until such time as this is required by law. In cases where the NEDC figures are specified as value ranges, these do not refer to a particular individual vehicle and do not constitute part of the sales offering. They are intended exclusively as a means of comparison between different vehicle types. Additional equipment and accessories (e.g. add-on parts, different tyre formats, etc.) may change the relevant vehicle parameters, such as weight, rolling resistance and aerodynamics, and, in conjunction with weather and traffic conditions and individual driving style, may affect fuel consumption, electrical power consumption, CO₂ emissions and the performance figures for the vehicle.

Further information on official fuel consumption figures and the official specific CO₂ emissions of new passenger cars can be found in the "Guide on the fuel economy, CO₂ emissions and power consumption of new passenger car models", which is available free of charge at all sales dealerships and from DAT Deutsche Automobil Treuhand GmbH, Hellmuth-Hirth-Str. 1, D-73760 Ostfildern, Germany and at www.dat.de.

The Audi Group, with its brands Audi, Ducati and Lamborghini, is one of the most successful manufacturers of automobiles and motorcycles in the premium segment. It is present in more than 100 markets worldwide and produces at 18 locations in 13 countries. 100 percent subsidiaries of AUDI AG include Audi Sport GmbH (Neckarsulm), Automobili Lamborghini S.p.A. (Sant'Agata Bolognese, Italy) and Ducati Motor Holding S.p.A. (Bologna, Italy).

In 2018, the Audi Group delivered to customers about 1.812 million automobiles of the Audi brand, 5,750 sports cars of the Lamborghini brand and 53,004 motorcycles of the Ducati brand. In the 2018 fiscal year, AUDI AG achieved total revenue of €59.2 billion and an operating profit before special items of €4.7 billion. At present, approximately 90,000 people work for the company all over the world, more than 60,000 of them in Germany. Audi focuses on sustainable products and technologies for the future of mobility.
