



2018 Annual Report

e-evaluation



China

6,843,000

Production of
electric vehicles
and plug-in hybrids
through 2021
(overall market
forecast)



USA

3,058,000

Germany

2,247,000

EUR 25 trillion

Worldwide investments
in sustainable assets

2016

2014

2012

China

83 %

General willingness
to buy a
self-driving car

Germany

48 %

USA

43 %

2023

342.6 million

Forecast of the
worldwide stock of
connected cars

2021

241.5 million

2019

154.0 million





PHOTOS: Tobias Sagmeister, AUDI AG // SOURCES, COVER: see p. 10, 24, 46, 62

BRAM SCHOT



Dear Readers,
Dear Shareholders,

Just meeting expectations – that’s not enough for us. We want to set new standards! For this reason, we are completely rethinking Audi. We are convinced of the great potential of both our company and our brand. We have learned from past mistakes: Today Audi stands for a culture of openness and honesty.

We place our customers at the center of our actions. We focus on customer-relevant solutions and implement them resolutely. By doing so, we are, for example, creating a new ecosystem for electric cars by developing a worldwide charging network with our partners. Our Roadmap E features the market launch of our first fully electric SUV, the Audi e-tron, followed by a total of a dozen electrified models by 2020, including five with full battery-electric drive. This means we will offer sustainable premium mobility to our customers in all segments.

An important pillar of our global business model is China. We already invested in this market 30 years ago as the first premium brand. We are currently deepening our commitment here and, when it comes to our products, focusing even more closely on local development and production. Furthermore, we can pick up on technology and mobility trends in China directly and incorporate these into our products for customers worldwide.

We are expanding our business to include new service products that range from digital services to intermodal mobility concepts. The need for investments in pioneering fields such as electric mobility, autonomous driving and digital services is enormous. The underlying transformation of Audi therefore requires focus and resolve.

Read how we at Audi are continuing to develop our business model 110 years on. The motto of this Annual Report “e-valuation” stands for a transparent company that lives its values and creates value sustainably.

Bram Schot

Electric mobility

What drives us: projects of the Board of Management 4 – 9

Electric mobility only works as a system

16 – 23

10 – 15

Digital business

Audi counts on digital services and products 32 – 33

Ducati and Audi join forces for more safety 34 – 37

From A1 to Q8: the tech experience for all customer segments 38 – 43

The Urus catapults Lamborghini forward 44 – 45

24 – 31

Transparency is our mission: The numbers have to be right. But it takes more to make the transformation of Audi tangible and to keep all stakeholders informed. It takes backgrounds. Strategic. Substantiated. Compact. Here we are **Talking Business.**

[audi.com/talking-business](https://www.audi.com/talking-business)

B

Future market China

Open to new technologies:
“Vorsprung” in Chinese

54 – 57

Out and about in the smart city:
Always on

58 – 61

46
– 53

Rethinking respon- sibility

In the loop: Audi promotes
the circular economy

68 – 71

Next? IT! Audi and
Microsoft in dialogue

72 – 75

Retail in transformation?
Retailers in transformation!

76 – 81

62 – 67

Finances

Report of the Supervisory Board

84 – 88

Combined Management Report

89 – 172

Consolidated Financial
Statements of the Audi Group

173 – 260

What drives us: projects of the Board of Management

2019 is an important year for Audi, a year of transformation. The Audi Board of Management is driving the company's new departure with these projects.

» My aspiration: To set new standards with Audi. We are currently in a challenging phase. Our sustainable economic success, our profitability and our future viability are at stake. That is why 2019 is the year of new beginnings for us. We at Audi are all pitching in and giving our company and the brand with the Four Rings a new direction. We operate with focus and resolve. We are putting our cost structures to the test and are improving these sustainably. At the same time, we will make even more systematic use in the future of the synergies and scaling effects offered by the Volkswagen Group. Setting standards to me means being the benchmark. — We will continue to hone our business model in China together with our partners. In this way we wish to keep our leading role in the Chinese premium automotive market in the future. At the same time, the significance of digital services or intermodal mobility concepts is also growing at a rapid rate – and not only in China. — We will offer the right solutions for our customers because we listen to them and place their needs at the center of all that we do. To shape the future in this way, we will develop our team and our organization further. Training and agility for me are as much of a focus as the systematic implementation of our plans. — But there is one thing that is particularly important to me: I want to pull together with all Audi employees. Only together will we be successful in making Audi the benchmark. We are Audi. «

Audi CEO Bram Schot has a plan for the Four Rings.

BRAM SCHOT

Chairman of the Board of Management of AUDI AG and
interim Member of the Board for Marketing and Sales

Total expenditures of the company
in the next five years around

40 billion
euros

by 2023 →

PHOTOS: Thomas Dashuber, Matthias Haslauer, Jens Passoth


CFO Alexander Seitz is firmly advancing the company's business in China, the largest single market for Audi.



» The future is already becoming reality in China. Many Chinese are enthusiastic about technological innovations. They view their smartphones as portable all-rounders for every area of their lives, including their cars, of course. In part, it is this openness and this hands-on mentality that make China, in my view, the orientation market for the mobility of the future – and they are also the reason why I find this international collaboration so rewarding. — I lived and worked in China for many years. I understand the restlessness of the Chinese. We are keeping up with this speed. China is the largest market for Audi. This is why we are driving our business in China forward faster and moving the product even closer to customers' needs: In the future, we plan to sell more than one million Audi

models across China every year. In addition, the local portfolio with our partner FAW will grow to 12 models by 2022. We are also developing further collaborations in order to strengthen our business in China. This is also advancing the Audi Transformation Plan. With this program of measures, we want to free up around 15 billion euros between 2018 and the end of 2022 to make our company fit for the future and safeguard our rates of return. «

By 2022, Audi wants to increase the local portfolio in China together with its partner FAW to

12 
models.

Member of the Board of Management of AUDI AG
Finance, China, Compliance and Integrity

ALEXANDER SEITZ

WENDELIN GÖBEL

Member of the Board of Management of AUDI AG
Human Resources and Organization

For its advanced training initiative, Audi is also placing an emphasis on digital learning formats. Wendelin Göbel in discussion with Audi apprentices about their experiences with the virtual reality headset.

» Thinking differently and daring to try new things are part of our company's DNA. Nonetheless, the upheaval in the automotive industry is presenting us with major challenges. I am convinced that this transformation will succeed if we embrace it resolutely and play a significant role in shaping it. This requires changed ways of thinking and greater openness for what is new. Essentially, we need to critically examine our processes and make them more customer-oriented. Compliance and integrity are at the center of our corporate culture. Agile ways of working unlock creative potential. As a result, our brand will become faster, more innovative and therefore commercially more successful.

— In the automotive future, certain key skills will become increasingly more important as digitalization progresses. Here we have committed ourselves to the task of further expanding the expertise of our employees. Because it is the people at Audi, with their ideas and passion, who will fuel our future success. This is why we are counting on targeted internal human resources development and have increased our advanced training budget to about 500 million euros by 2025. Together we will tackle this transformation and the changes it requires – and in this way secure new 'Vorsprung'. «

Audi has increased its budget for advanced training to 500 million euros through 2025.

500 ↑ **2025**
million euros

HANS-JOACHIM ROTHENPIELER

Member of the Board of Management of AUDI AG
Technical Development

14
billion euros

2023

Investments by the end of 2023
in electric mobility, digital
services and autonomous driving

The mobility experience goes beyond the car itself: Hans-Joachim Rothenpieler (right) and Head of Design Marc Lichte in discussion about the future concept Audi Aicon.

» Audi stands for 'Vorsprung durch Technik.' We are redefining this by further developing the car as a central element in a connected ecosystem and thinking in terms of mobility experiences from the customer's perspective. We will be realigning Technical Development for this purpose. Based on my many years of experience in the Volkswagen Group, the following is important to me: Consistent process discipline and operational excellence are just as valuable as the innovative power that has always characterized Audi. By the end of 2023, we will invest 14 billion euros in electric mobility, digital services and autonomous driving. At the same time, Technical Development is pursuing one clear technological goal for the next few years. We will produce new freedom in mobility for our customers, and the interior will enable unique worlds of experience. An important aspect in this context is autonomous driving. I want to and will work with my team not just to keep up with this turbulent phase of technological change, but to set the pace once again. Because 'Vorsprung durch Technik' has to be demonstrated all over again every day. This is our, this is my aspiration. «

Everything at a glance thanks to a digital device: Peter Kössler and an employee in the production area at the Audi plant in Ingolstadt.



PETER KÖSSLER

Member of the Board of Management of AUDI AG
Production and Logistics

» Making the Audi sites fit for the future – that is our joint task in the Production team. To do so, we have set ourselves ambitious goals: For example, we want to increase productivity in our plants by an average of 30 percent by 2025. — One contribution to this is made by innovative technologies, which already help us structure our manufacturing processes to be more efficient, connect interfaces optimally with each other and thus make factories more intelligent. One example is the electronic quality check. This digitally maps the production line and ensures a high level of quality in our vehicles. This process optimization supports our team and sustainably increases efficiency. Thanks to mobile end devices, employees gain more time for each car. And the environment also benefits: We now use around ten million fewer pieces of paper a year, or almost 83,000 kilograms less. — This shows just how important the mindful use of valuable resources is for us at Audi. Our site in Mexico, for example, manufactures the Audi Q5 entirely without waste water. And we are continuing to work intensively to reduce the carbon footprint of our manufacturing sites. Audi Brussels is a pioneer here: The plant has been manufacturing the first fully electric Audi since 2018 using completely carbon-neutral processes. In the long term, we want production at every site to be completely carbon-neutral. — Every one of these milestones makes me proud and allows me to look to the future with optimism. We have chosen the correct path for preparing Audi Production as well as possible for the challenges of the future. «

Increase in productivity at Audi plants by 2025 by an average of

+30%

| 2025

Electric mobility is becoming increasingly important worldwide



Production of electric vehicles and plug-in hybrids through 2021 (overall market forecast)

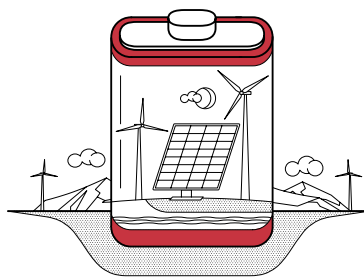
China will lead the market with the highest production volume, followed by the USA and Germany.

Electric mobility is changing our daily lives. For the automotive industry, what will really count in the future is optimal networking and the right partners.

To understand how electric mobility will change our lives, let us take a look at an ordinary streetlight. It has been standing shoulder to shoulder with other streetlights for generations, turning itself on in the evening and off in the morning. But most of the time, it does: nothing. Sure, you can chain your bicycle to it or post a message on it about lost keys, but that's about it. —

A smart streetlight, on the other hand – and here we are fast-forwarding to the future of electric mobility – is a true jack of all trades: You can use it to charge your smartphone or all kinds of electric vehicles and pay for the electricity using your mobile device. This streetlight is so smart, it not only illuminates all the traffic going by, it even analyzes each car that passes. The data gathered by the streetlight and its curbside colleagues is fed into an even cleverer computer. That computer then calculates in real time how, for instance, the city's traffic lights should be phased to ensure traffic flows smoothly. The fact that a streetlight also illuminates the street at night is almost beside the point. Welcome to the future? The ingredients for this scenario have been around for some time now. And they already work, right here and now. — Electric mobility requires changing more than just the engine. This is why the debate on battery range and charging stations instead of gas stations falls short of the mark. Electric vehicles are triggering developments that will change our everyday lives. They are breaking down established structures and promoting cooperation between industries. New services are arising in connection with networked driving – from intelligent charging infrastructures all the way to billing models. New standards need to be created and implemented – a process in which cooperation and competition will fuse. Coopetition is the new buzzword. Both new and proven players will contribute to the best solution in order to achieve a specific goal together.

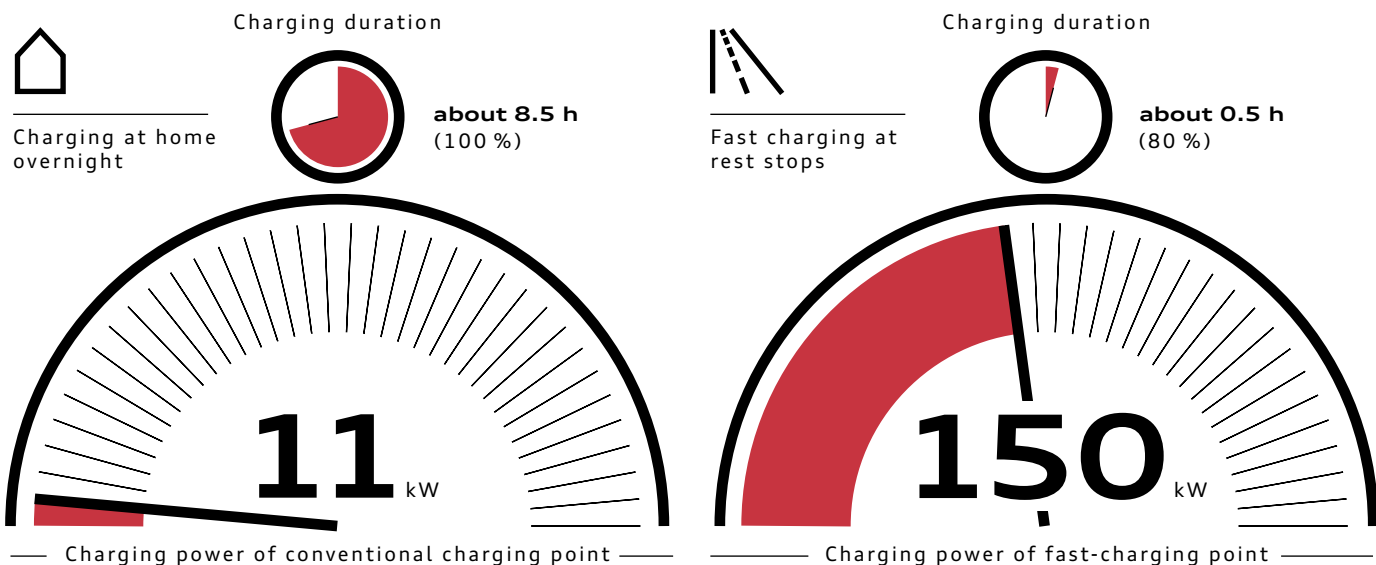
The two most important questions are: Where does the power come from? And who provides the infrastructure? That is something car manufacturers cannot do alone. The era of electric mobility will be much too diverse for that. This is by no means the only sector undergoing reorientation: Power companies, for example, are also rethinking their business models. They are connecting buildings or even whole residential areas with the help of smart grids to ensure that electricity is always available where it is needed. If private households, for example, generate more power than necessary through solar systems, the customers in turn supply this electricity to the energy providers. Electric cars play an important role in these complex structures. In the future they will store energy, then use it or feed unused battery capacity into the network – thus becoming part of the system. ■■■ It is not likely that electric mobility will run out of electricity. American economist Jeremy Rifkin even prophesies a surplus of electrical power that is unique in human history – and it will not come from fossil energy sources. In his book “The Third Industrial Revolution,” Rifkin describes a scenario in which more and more renewable energy will be produced at ever lower prices because buildings will also produce electricity, just like windparks and various types of power plant. Every last square meter of surface on the facade and roof will contain integrated thin-film solar panels. Green energy will flow in abundance, writes Rifkin, be intelligently stored and cleverly distributed with the help of algorithms. Technically speaking, it is all possible today. ■■■ What is possible must, however, be supported if it is to become a reality. For this reason, governments around the world have launched ambitious programs to promote electric mobility. They focus on these core areas: expansion of the charging infrastructure, buying incentives for customers as well as electric vehicles in government-agency fleets. Norway



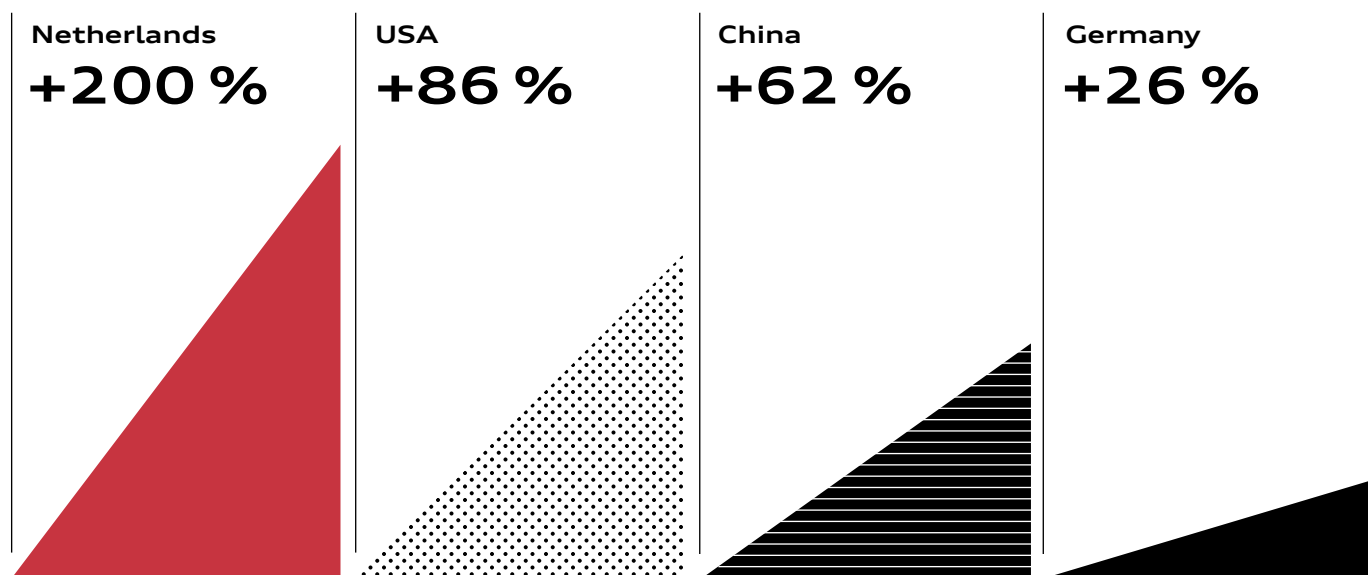
could serve as a role model in this regard: Electric cars there are exempt from import tax and the 25 percent value-added tax. They enjoy a privileged status on Norway's roads, including toll exemptions, free ferry trips and, in some cities, even free parking. The result: In 2018, nearly half of all newly licensed cars in Norway had an electric or plug-in hybrid drive system. Larger markets still have a long way to go to achieve numbers like these. This figure was 4.5 percent in China and 2.1 percent in the United States, whereas in Germany it rose to 2.0 percent. But even if the growth curve in industrial nations already suggests a steep rise: the management consulting firm Boston Consulting Group assumes that only 5.0 percent of cars worldwide will be plug-in hybrids or electric cars in 2020. Only in the coming decade will electric mobility really pick up speed, with the share of electric cars rising to more than one-third, and even higher in highly developed markets. ■■■ At least if the discussion about range can be ended by then. At the moment, drivers worry that their electric cars will leave them stranded when they are trying to get somewhere. Due to insufficient range. This has led to tinkering with the charging infrastructure and plans to increase battery capacity.

Where does the power come from? And who provides the infrastructure? That is something car manufacturers cannot do alone.

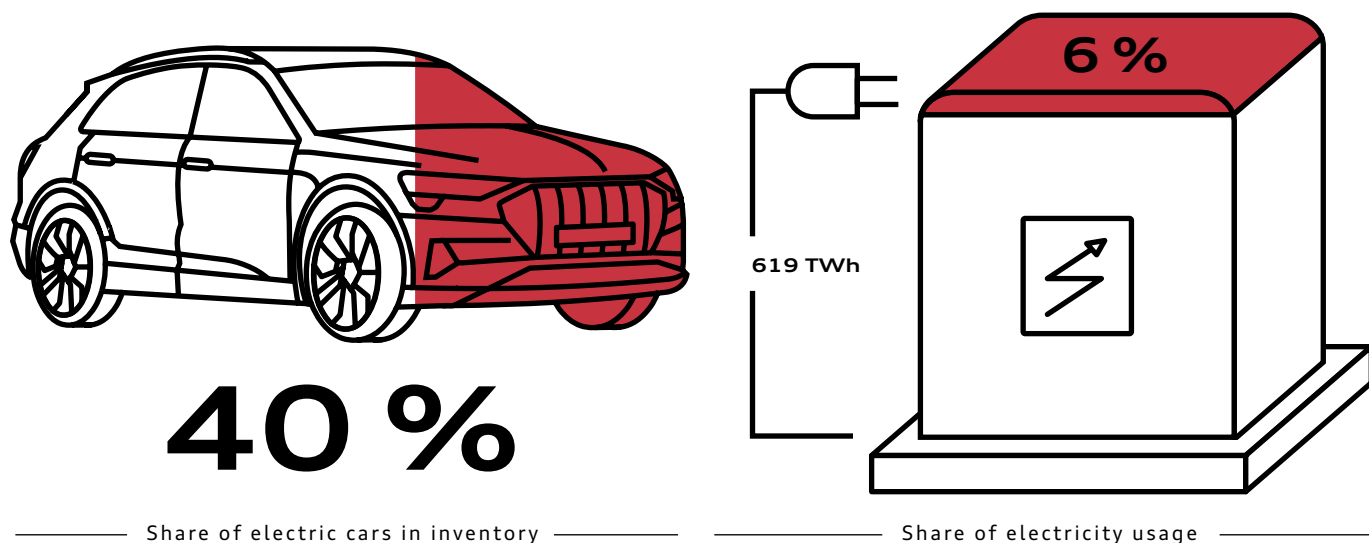
▼ **Charging power and charging duration** (using the Audi e-tron as an example, battery energy content 95 kWh)



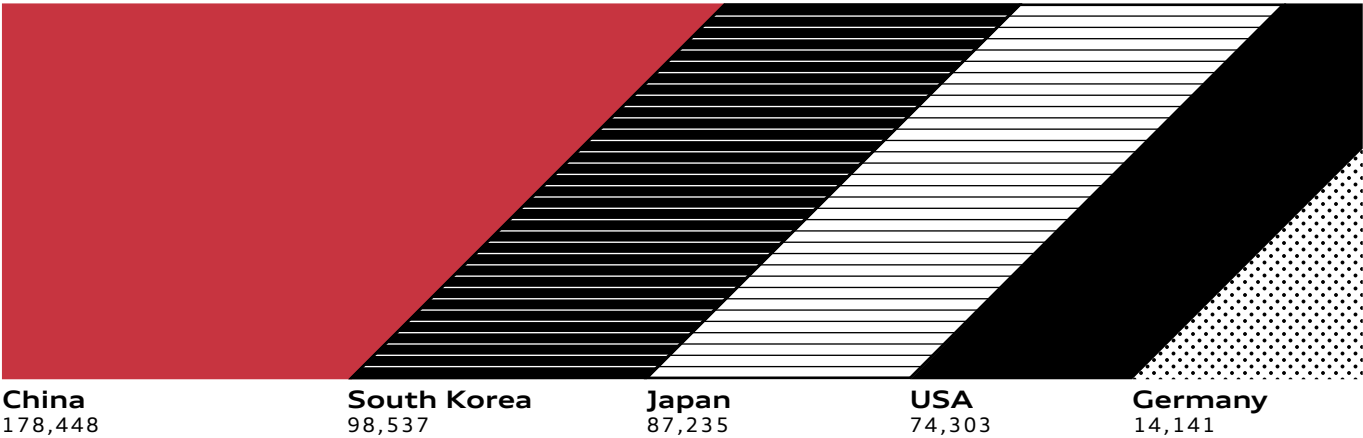
▼ **Increase in sales of electric vehicles and plug-in hybrids 2018**



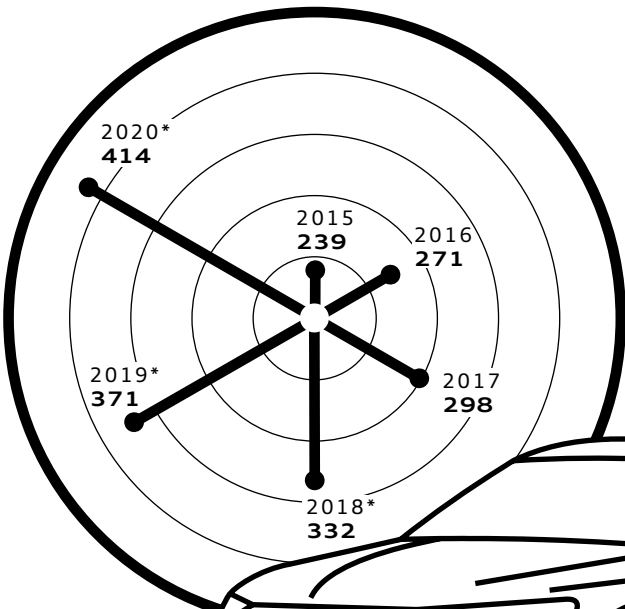
▼ **Share of electric cars in electricity demand** (forecast 2050 for Germany)



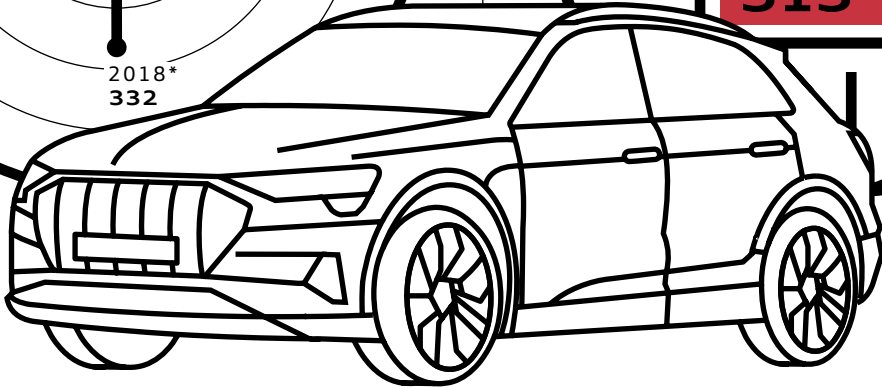
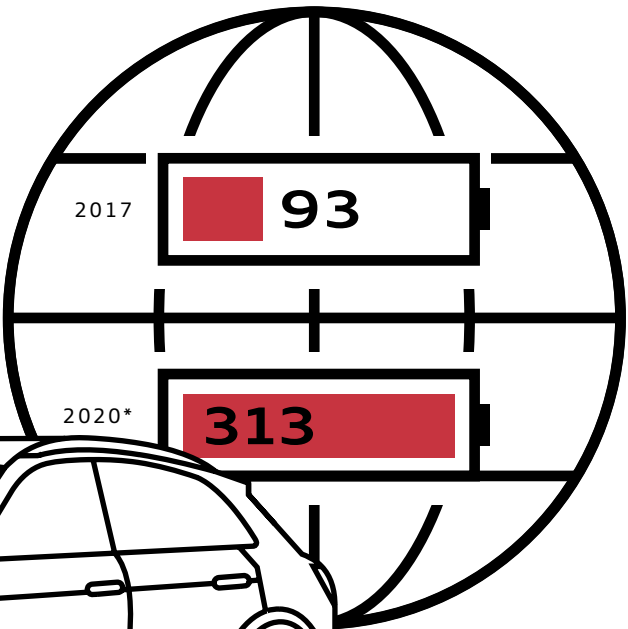
▼ Battery cell production for electric cars (selected countries, from 2016 to 2021, in MWh, forecast)



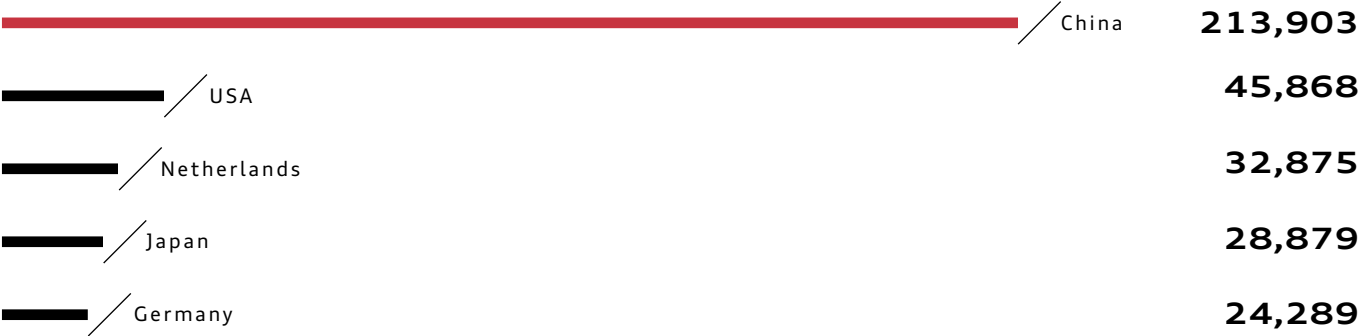
▼ Range of electric vehicles based on NEDC (average in km, *forecast)



▼ Production capacity of battery cells for electric cars (worldwide, in GWh, *forecast)



▼ Number of public charging points

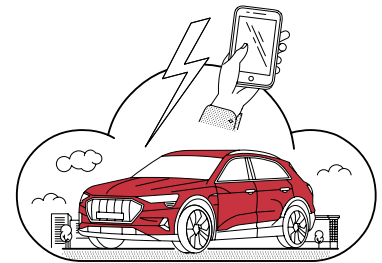


The product will become a part of the system and the infrastructure, in which supporting apps will be just as important as output.

Solid-state batteries could replace standard lithium-ion batteries, some manufacturers swear by phosphate-based compounds, others by sodium. Then 800 kilometers should be possible. Batteries are in the spotlight for another reason as well: because of the sheer number of them needed for electric mobility worldwide. If urban transportation becomes purely electric, we will need factories somewhere to manufacture the batteries. And manufacturing

batteries currently requires raw materials for which sustainable mining poses a challenge. The debate on range will probably lose steam as soon as a reliable network of charging stations is established. Precisely this network will become even denser, everywhere in the world. In Denmark, there are now more charging stations than gas stations. IONITY is planning to operate a network of around 400 fast-charging stations in 25 European countries by 2020. The company, a joint venture of several car manufacturers, is a good example of coooperation.

And of how automakers are thinking – and taking action – beyond apparent boundaries. The product will become a part of the system and the infrastructure, in which supporting apps will be just as important as output. To develop such apps, the companies are working with



software companies. To create a dense network of charging stations, they are involving power companies. Navigation systems guide drivers and their electric cars to tens of thousands of charging points. When charging their cars, drivers will be automatically billed at the end of the month on the basis of only one contract that has uniform and transparent price structures – a kind of credit card for mobility. With the help of cryptographic processes, vehicles will very soon even authorize themselves when charging. In this way, manufacturers will offer their customers a comprehensive ecosystem. After all, people do not want to have their cars just sitting in front of their houses, they also want to link them to their home electricity production. Companies are developing

products that contain both the necessary hardware as well as smart solutions that, for example, use electricity at the cheapest times for charging or only use self-produced solar energy. Wisely implemented, electric mobility can and will move people – in both senses of the word. The car communicates with the driver, with other vehicles and with the infrastructure, and adjusts its driving and charging behavior accordingly. Cities will connect their systems; local public transportation, private vehicles and car-sharing models will smoothly merge together; demand for parking areas will fall significantly; city dwellers will recover urban space. Whether or not you will still be able to chain your bicycle to a streetlight is debatable, however. After all, those streetlights will be high tech by then.

Further articles on the subject at:

[audi.com/talking-business](https://www.audi.com/talking-business)

Electric mobility only works as a system

Dr. Stefan Niemand is convinced that the Audi e-tron is a game changer. He has been at Audi since 2011 and responsible for electrification in the product line since 2016.



TEXT: Franziska Queling // PHOTOS: Tobias Sagmeister

Electric mobility is changing not only how we drive cars. It is also changing our lives. We will largely charge our vehicles at home – but we will also need a source of energy while out and about. That is why Audi is making electric mobility suitable for daily use for its customers – far beyond the market introduction of its first fully electric model, the e-tron. Audi is helping customers around the world to integrate electric mobility into their lives. Dr. Stefan Niemand, who is responsible for electrification in the Audi e-tron product line, talks about this integrated approach.



In September 2018, the Audi e-tron was presented in San Francisco. The fully electric SUV is being well-received by customers: At the end of 2018, there were already just under 20,000 advance orders. What does this model mean for Audi?

Niemand For us, the Audi e-tron is more than just a standard new model. The e-tron takes Audi into the age of electric mobility. It is the first

premium SUV for comfortable everyday use – plus it has an appealing design and innovative features. It was important to us to present a strong electric car in this rapidly growing segment early on. And our production planning for the Brussels plant shows we believe in the Audi e-tron as a volume model. Together with the e-tron Sportback, the Belgian site is fully booked out. Adopting an integrated approach in this area was equally important to us.



What exactly does your integrated strategy for electrification involve?

There is far more to electrification than the car – it only works as a system. Aside from the vehicle's price and range, the charging infrastructure and charging duration are key factors in helping electric mobility become successfully established. Even if we are a premium manufacturer of cars, we want to play our part in helping build up an integrated ecosystem of electric mobility. Only then will our customers have access to a premium experience right across the board. Our involvement here spans everything from participating in the cross-OEM joint venture IONITY, which is establishing fast-charging stations along major European traffic routes, through expanding into the USA with Electrify America, to home-based charging solutions that are being offered in the USA in partnership with Amazon Home Services. We hope all this will also jump-start acceptance among the wider population and so help make electric mobility a success.

What are the concerns that you would like to address?

One is definitely the fear of lengthy charging times.

With the Audi e-tron, we are offering our customers

a car that is efficient and can be charged in quite a variety of ways: in the garage and in transit with alternating current, or in IONITY's new direct-current charging network – there the battery can be topped up for the next long drive in around half an hour. Also, a lot of people think charging is more complicated than refueling. But they overlook the fact that charging at home or while at work guarantees that our customers will then set off with a full "tank" every day, and that it actually only costs ten seconds of their time: five seconds to plug in, five seconds to unplug. This means that, for ordinary day-to-day driving, going to a gas station is no longer necessary. If our e-tron customers do need to recharge on longer drives or at their destination, the Audi e-tron Charging Service is a very convenient solution. Just one card gives them access to 80 percent of public charging points – more than 72,000 throughout Europe. All that is also fully connected with the smartphone. In the course of 2019, the car will even authorize itself at the charger and activate it. That is what we mean by straightforward, care-free electric mobility. The route planner



Electric mobility is changing our lives, particularly as refueling makes way for recharging. Vehicles are usually charged at home or while at work. But public charging stations are also available en route.





displaying charging stations along the planned route is hugely beneficial, too.

By 2025, the aim is for one in three sold Audi cars to be electric, and the company wants to sell around 800,000 electric cars and plug-in hybrids. How do you propose to achieve these ambitious targets?

The Audi e-tron kicks off the roll-out of the comprehensive Audi Roadmap E for the coming years. The goal is to electrify all segments completely

or in part by 2025. The next steps after the Audi e-tron will be the e-tron Sportback and the Audi Q2 L e-tron for China. The series-production version of the e-tron GT concept will follow in 2020, and shortly after that we will also be launching an electrified model in the compact segment.






A number of analysts and competitors claim that product profitability is the biggest challenge when it comes to electric mobility – primarily owing to the battery costs. How does Audi intend to make a profit?

Obviously new technologies involve high initial costs – among other reasons because we want to deliver our customary standard of quality. We will nevertheless achieve our goals with a competitive cost structure. For example, we are tapping Group-wide synergies with modular assembly matrixes, platforms and carry-over parts. Innovations specifically in battery technology and the electric driveline, ongoing improvements to the value chain, reducing complexity and localization decisions equally play an important role. Within the Volkswagen Group, we are working together on the electric architecture for the compact and high-end segments. Being able to exploit that synergy potential is a clear USP of the Group structure. Close cooperation, distinct areas of responsibility and scaling are what drive increased profitability – whether in partnership with Volkswagen or Porsche. The Premium Architecture Electrification (PPE), for

Electrification is allowing developers to reinvent the car. A first impressive result: the Audi e-tron.



example, will be taking effect from as early as 2022. This will help both Audi and Porsche to increase efficiency by up to 30 percent compared with separate development by the individual brands. Economies of scale also play an important role – and that is where the Volkswagen Group is clearly at an advantage, having annual sales of more than 10 million cars. Audi is also tapping into new sources of revenue, such as supplemental digital services that our customers can order via app, as well as charging and energy services. Someday, electric cars will cost just the same as vehicles with a combustion engine.

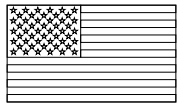
When is someday?

We will not have to wait too much longer. I am convinced that we will get there in the next few years.



Charging in the USA and Europe: an overview

Electrify America wants to build around 500 fast-charging stations. In Europe, IONITY is planning 400 locations with several chargers each, and is targeting this goal for 2020.

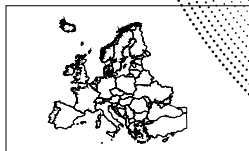


500

charging stations
by the middle
of 2019

• = 10 charging
stations

**USA /
Electrify America**



Charging stations in
25 countries

One charging station every
120 km

Additionally in Europe:

Audi e-tron Charging Service
Currently, access to 80 percent
of all public chargers in more
than 13 European countries,
i.e. over 72,000 charging points
from 220 providers

17 metropolitan regions
2 coast-to-coast routes

One charging station every

193 km

112 km

on key routes

Charging stations in
39 states



**Europe /
IONITY**

400

charging stations
by 2020



Ensuring that charging does not take longer than your coffee break

- The Audi e-tron is the first vehicle in the Audi electric initiative that the premium brand is following to electrify every segment of its portfolio by 2025. That will involve bringing out around 30 electrified models in rapid succession: In 2019, the Audi e-tron Sportback will be the second electric car to go on sale, while the Q2 L e-tron will be introduced in China. The series-production version of the e-tron GT concept from Audi Sport will follow in 2020. Audi will also unveil an electric model in the premium compact segment in 2020.
- Audi wants to sell around 800,000 electric cars and plug-in hybrids in 2025. To achieve that goal, around 14 billion euros are to be invested in future topics by the end of 2023, above all in areas such as electric mobility, autonomous driving and digitalization. The company benefits here from increased profitability within the Group as a result of clear areas of responsibility and scalability – whether in partnership with Volkswagen or Porsche.
- Alongside price and the cars' range, the charging infrastructure and charging duration are important success factors for electric mobility. For this reason, Audi is contributing to the integrated ecosystem – for example, by participating in the cross-OEM joint venture IONITY, through the expansion with Electrify America in the USA or with charging solutions at home.
- Through its subsidiary company Electrify America, the Volkswagen Group is setting up a total of 2,000 fast-charging stations along main traffic routes in the USA where every electric car can be charged irrespective of brand. This initiative is based on settlement agreements with the US authorities as a result of the diesel issue.

Everything will be connected in the automotive future

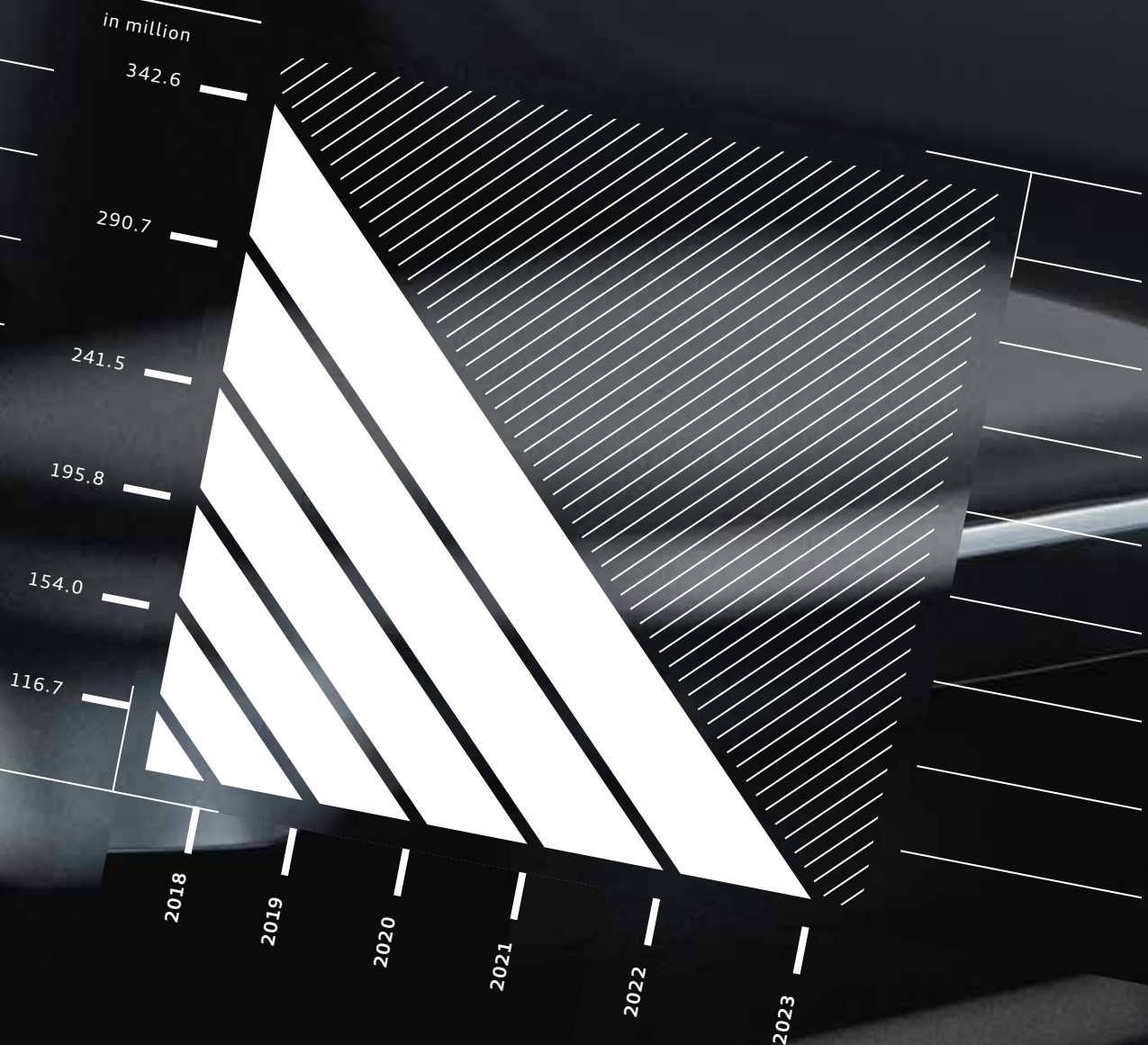


PHOTO: Tobias Sagmeister // ILLUSTRATIONS: Eva Revolver // SOURCE: Statista GmbH

**Forecast of the worldwide stock of
connected cars**

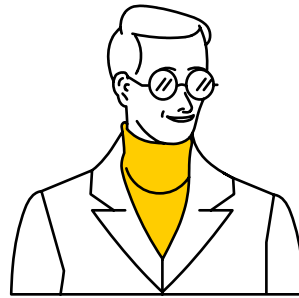
The worldwide stock of connected cars is expected to triple by 2023 to 342.6 million.

Digital business:

The mobility of tomorrow builds on people's digital worlds. So car manufacturers are using digital services to find new business models and sources of income.

There is always room for improvement. Engineers from around the world are competing to develop the best possible car. Now the rules of the game are changing and car manufacturers are questioning the way they have always defined themselves. They are thinking beyond cars as a product and focusing on the digital world of the customer, worlds in which mobility is naturally integrated. The best possible user experience is what is required: Customers want to book, use and manage digital services as conveniently as possible. For that reason, mobility is being tailored to the touchpoints of a changed customer journey. — Sounds pretty abstract, right? The following pages offer you a look at a future in which car manufacturers have reinvented themselves through lucrative digital business models. As mobility providers.

VINCENT



Age	46
Profession	FINANCIAL ANALYST
Status	MARRIED
Location	FRANKFURT
Uses	PERSONALIZED ENTERTAINMENT/ OWNERSHIP MODEL/ INTELLIGENT NAVIGATION

< Daddy, when will we be at Grandma's? > Amelie asks from the back seat, surrounded by a bunch of stuffed animals.

< Soon, > says Vincent and sighs. < Is your audiobook boring? >

< It's really weird. Joe, the man in the book, is walking all over town looking for his car. It's so stupid. Cars come to us, don't they?! >

< It must be an old book. Things used to be different. Today we are pleased that we have the autonomous school bus to pick you and Hanna up at home in the morning and take you to school. >

The onboard computer chimes in: < We can offer you an optimized route in the automatic lane. The average speed of the cars in the lane that you are merging onto is 80 kilometers per hour. You will save energy by using the slipstream. If you stay in the manual lane, this route will cost you an additional five percent in your rate category. >

< Does the route include the same recharging stops that were calculated before? > Vincent asks the car's virtual assistant.

< You have a calculated stop at the Charge & Ride station in Frankfurt and a minimal charging time of 15 minutes for your route. Your pre-booked charging time is two hours, which includes a shuttle to the city center for your restaurant reserva-

tion. Payments are made through the default settings in the app. >

< Then merge onto the automatic lane, > says Vincent, bringing his seat into the relax position.

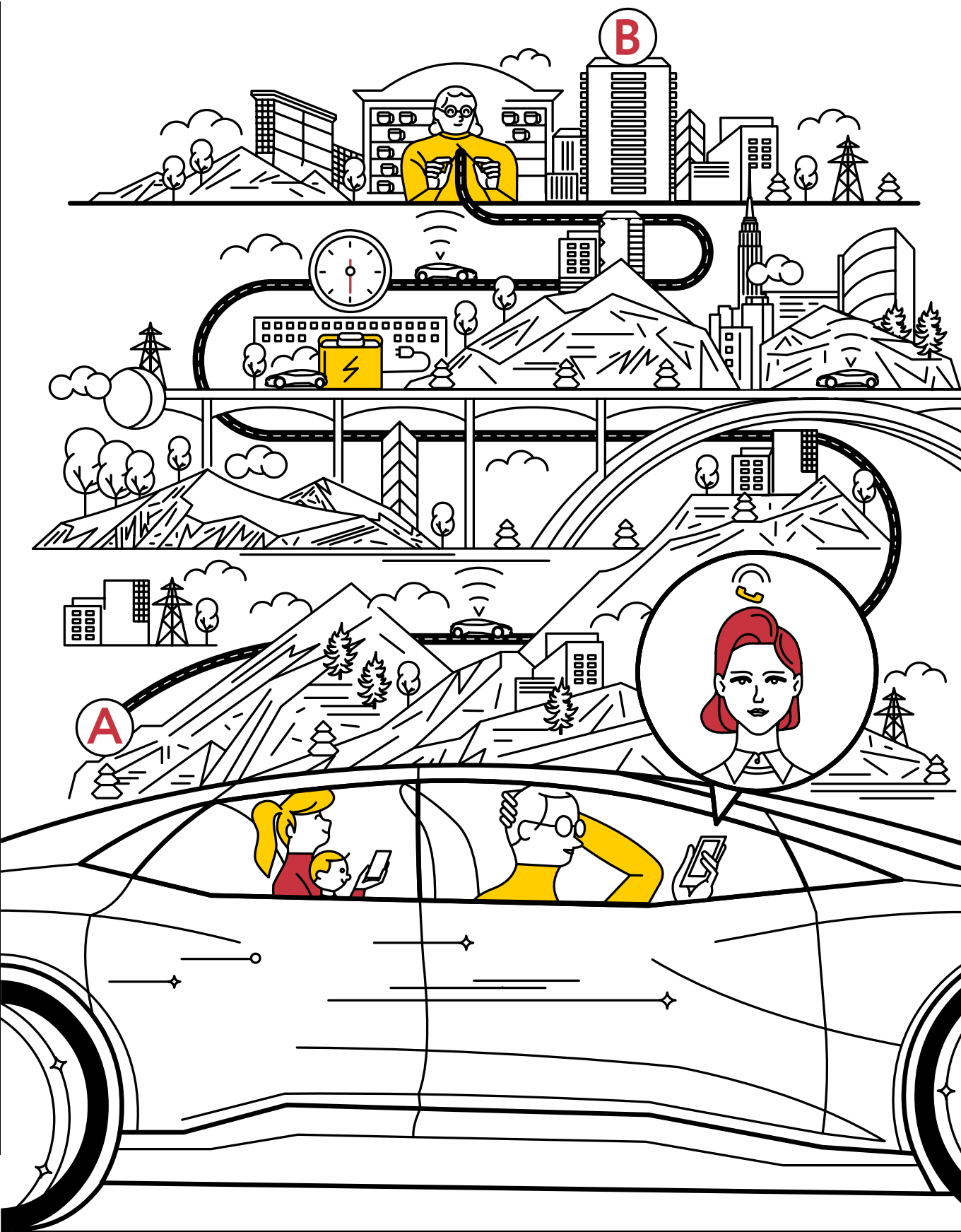
< Does Grandma still drive herself? > his teenage daughter Hanna asks from the back seat.

< Not as much as before. At first she refused to drive autonomously. She said she'd gone 40 years without having a single accident and she didn't need it. But since the first time we watched her favorite show together while we were traveling, she's been a big fan. >

< Movies in the car? Where Grandma lives? I thought there didn't use to be any Internet reception out there! >

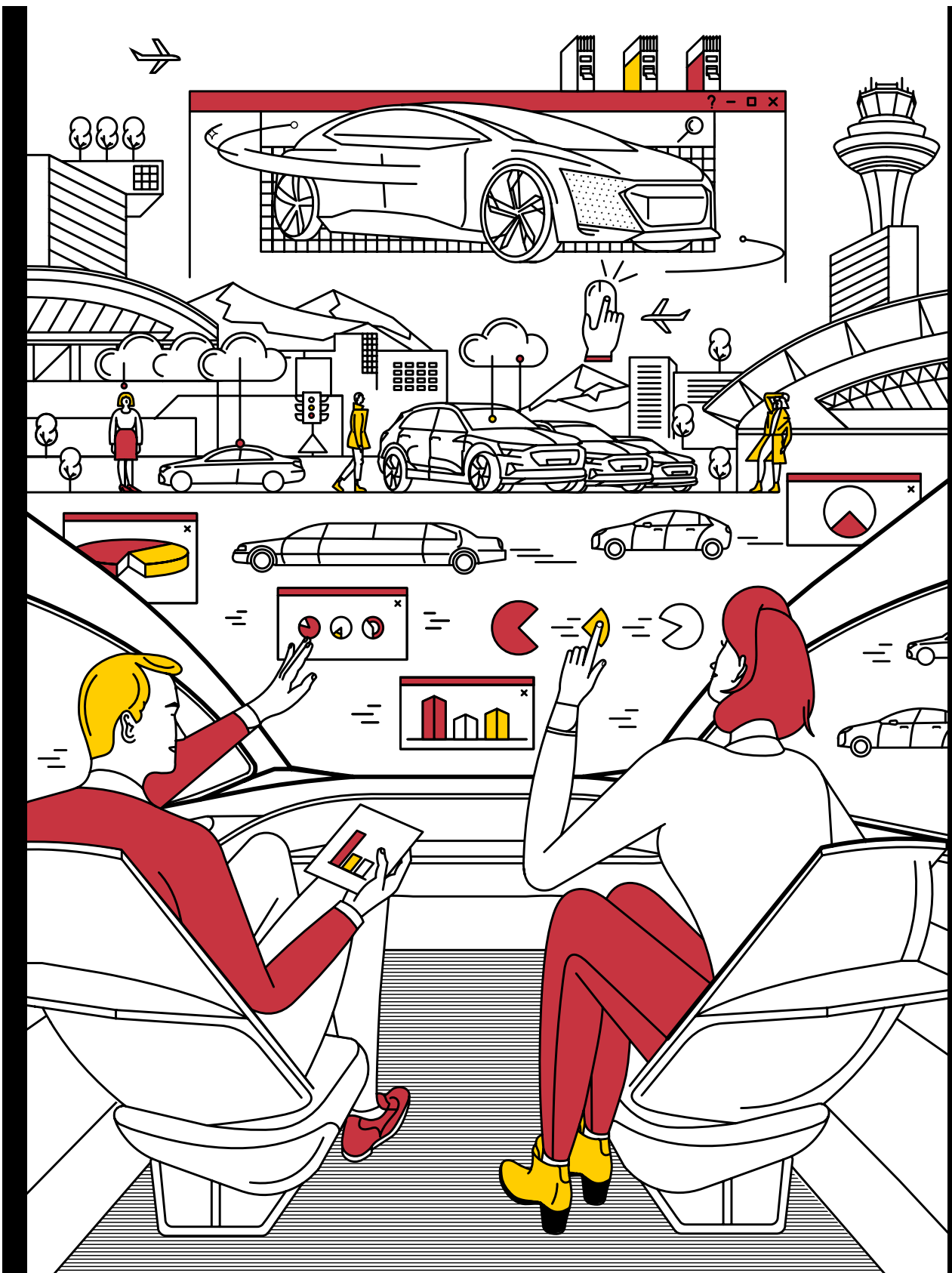
< Well, they added the lane for electric trucks to the highway, so they put in a power grid and set up cell towers. But you two need to be quiet for a moment, I have to call your mother. Alexa, call Ada Zobel. >

< Calling Ada Zobel. >



On their way to Grandma's

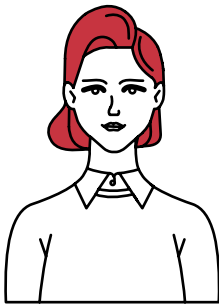
The computer recognizes the best route and plans convenient charging stops.



The car drives itself

Autonomous driving allows passengers to use their car as a mobile office.

ADA



Age	39
Profession	MANAGER
Status	MARRIED
Location	MADRID
Uses	ON-DEMAND SERVICES/ AUTONOMOUS DRIVING/ MOBILE PAYMENT/ MOBILE OFFICE

< Alexa, accept incoming call, > Ada says and uses the touchscreen console to turn down the volume a bit. < Hey, Señor, how are you? Just so you know, I have you on speaker. >

< No problem, I have to behave myself anyway – the kids are in the car, > says Vincent, his voice coming in through the digital cockpit.

< Mommy, Mommy, > Amelie can be heard saying from the back seat.

< We're almost at Grandma's! >

< Hey, that's right, that's today! Are you all doing okay? Did you pick up the car from the shop? >

< No, we're still using the replacement car. The mechanic and I had a video call this morning and he showed me something on the battery he wants to look at again. The shop found a discrepancy in our driving data. Once the car's repaired, they'll deliver it. Too bad, actually. I really like this loaner. But never mind that – are you coming home tomorrow? I saw on our customer account that you rented a just-in-time car in Madrid. >

< Yeah, Stephen and I have to visit the client. Luckily we were able to rent a self-driving car at the airport and are driving the whole way fully autonomously. So we can finalize the presentation now and sleep a couple of hours on the way back to the airport. >

< That's fantastic – that's a good use of your time! Stephen, how's everything your end? >

< Things are great! What's the problem with your car? Don't you have the SUV anymore? >

< No. Last time, the Sales Advisor came over with his tablet and said: 'We looked at your driving profile and the shuttles and vacations you've booked – why are you driving around with so much storage space that you don't need?' >

Ada jumps in: < They gave us two weeks to test the car. The new one is much more compact. I like it. That makes it a lot easier to find a parking spot in the app. >

< Speaking of parking spots, > Stephen says and looks at the route planner. < We have another 52 minutes and I'd like to arrive with a finished presentation. >

< Sorry, you're right, > says Ada. < Enjoy the rest of the trip! By the way, is Hanna with you? She hasn't said anything yet. >

< Our teenager is in the back on her smartphone – which is naturally much more important! She's probably on your daughter Nina's channel, Stephen. She seems to be really successful as an influencer. >

< Look, my dad shared my story again. He's really great, > says Nina during her break from the video shoot.

< Does he do it for you or for the cars? > asks Fred, her cameraman.

< For me, naturally. Otherwise he would have never gone to the showroom. But I had just promoted it downtown: 'Virtual reality driving – better than the real thing.' >

< And what did he think? >

< First he couldn't stop grumbling: 'Are you crazy? Buy a car I've never driven?' Then he tried out the VR headset in the showroom – and he loved it. But I was really surprised that he actually picked out his next car there. >

< Is he generally a catalog kind of guy? >

< Totally. He took home huge piles of them and made a science out of reading them all. >

< But he still has his own car? >

< Yeah – he'll never switch to on-demand completely. But when he drives his own car, he's really glad there aren't any trucks blocking the fast lane on the highway, since they now all automatically drive behind each other in one lane. And he's always booking extra services through his app that he used to say were 'total junk!' >

< What does he consider 'junk'? >

< He thought watching 4D movies in the car was unnecessary – that is until the first time he drove autonomously and got bored. And he treated himself to the traffic lane assistant for the serpentine roads through the Alps – and then just kept using the service. Oh, and don't get me started on the navigation system ...! >

< But that's standard! >

< Yeah, but a navigation system that learns, one that plans not just the charging stops on your route, but also stops in restaurants and cafés that meet your personal preferences – that's something he never

dreamed of. It really is a whole new level of navigation ... >

< Say, do you even know how to navigate your own way around? I bet you can't without autopilot! >

< Oh yeah? You're on! Let's settle this here and now! We'll let the likes decide which one of us is the better driver. >

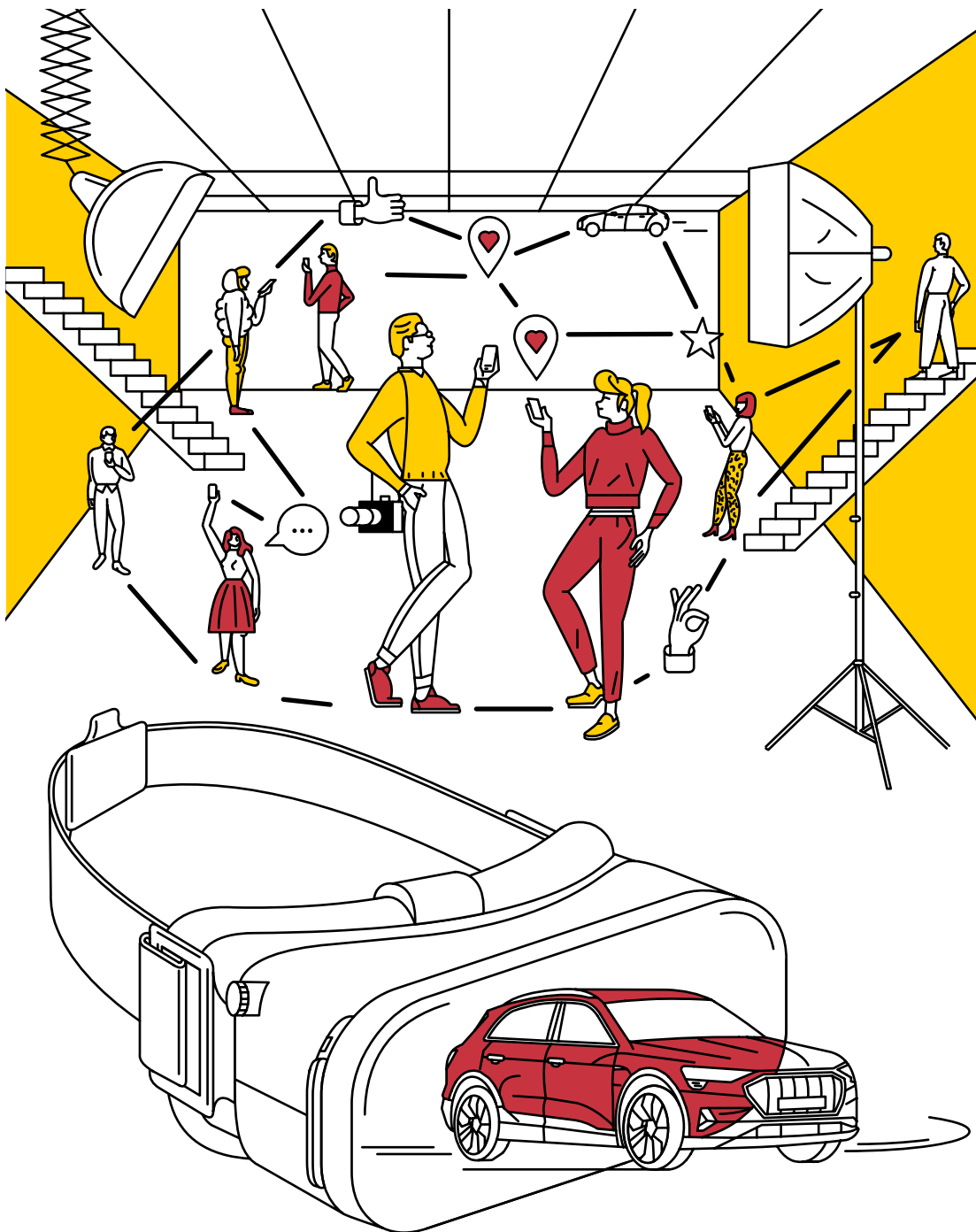
NINA



Age	21
Profession	INFLUENCER
Status	SINGLE
Location	BERLIN
Uses	VIRTUAL REALITY/ ON-DEMAND SERVICES/ PERSONALIZED ENTERTAINMENT

Further articles on the subject at:

[audi.com/talking-business](https://www.audi.com/talking-business)



Always online

The car of the future fits seamlessly into people's digital worlds.



Real revenues in digital worlds

Audi counts on
digital services
and products –
and conquers the
universe in the pro-
cess. Virtually,
anyway.

TEXT: Strichpunkt GmbH // PHOTOS: AUDI AG

The spaceship gets closer and closer, a collision is just seconds away. Your own vehicle suddenly veers to the left. Saved at the last minute! But the Audi isn't exploring outer space, it was simply making a very terrestrial left turn. For its passenger, however, it was something of a galactic swerve: Using a virtual reality headset, they were out saving the universe as an "Avenger." Extended reality is the key term here. The technology matches virtual content to the movements of the car in real time, the real and virtual worlds becoming one. ■ Audi developed the interactive experience together with Disney Games and Interactive Experiences and presented it in January 2019 at the CES technology show in Las Vegas. To commercialize the technology behind it, the subsidiary Audi Electronics Venture GmbH co-founded the startup holoride. The goal is to introduce this new entertainment format on the market across manufacturers as an open platform. The showcase is an example of how new digital business models covering all aspects of the car are being developed: The vehicle is becoming a digital platform. ■ But premium mobility will also become digital in the future beyond just interactive entertainment. Customers' daily lives are networked – and they expect their cars to be integrated seamlessly. Through its digital services, Audi is tapping new business models and sales potential. The myAudi customer portal is the central access point into the digital ecosystem, where all digital solutions can be booked, managed and used via an

intuitive interface. ■ Today customers can already sit on their sofas and order and finance Audi Approved :plus models around the clock, including Germany-wide delivery at a desired time and place. Audi is gradually scaling the platform internationally and is adding services and service products to it. ■ The vehicle history of used cars will also be depicted electronically and transparently in the future. This is aimed at making the purchase of a used Audi easier and safer. The licensing of swarm data to card providers, among others, could evolve into another business model. ■ A few more digital ideas perhaps? Using functions on demand, customers will in the future be able to order optional extras such as for lighting, assistance systems and infotainment flexibly and as needed even after a car has been purchased. ■ Audi is also developing and scaling premium mobility solutions: In more than 20 locations around the world, customers can already use Audi on demand on their smartphones to select, book and actively experience their dream vehicle from a fleet of top models. Following the acquisition by the Four Rings of the car-rental service Silvercar in the United States, 25 mobility hubs have been created under the "Silvercar by Audi" name. All the available destinations form the starting point for a global mobility network. ■ The range of offerings clearly shows that if you are serious about digitalization, you have to think and act holistically. And it's also worth exploring new galaxies.

Further information is available at:

audi.com/talking-business/holoride

T

Talking Business – Key Facts

B

Financial contribution of digital business models

- Audi is becoming a provider of individual premium mobility. This also includes the digital business models and services that are to contribute substantially to the Audi Group's operating profit in 2025.
- The following action areas were defined to reach this goal: connected car, connected data, connected mobility and connected retail.
- The personal key to the digital Audi world is myAudi. Through the portal, customers can access their Audi cars, book and use products and services.

Ducati and Audi join forces for more safety

People want technology to assist them, especially when things become dangerous. Ducati and Audi are jointly developing C-V2X assistance systems to help avoid accidents. Using the 5G mobile communications standard, the two companies are moving forward into the digitally connected traffic system of the future.

A foggy fall evening on California's Highway 1. Darkness has descended over the coastal road. Leo Warren's Ducati Monster 821 glides over the asphalt, purring deeply. He needs to make a left turn in just over 200 meters, at the end of a long curve in the road. Suddenly, an exclamation mark with a red border flashes in his helmet's head-up display and a woman's voice says: "Caution, Leo, vehicle approaching from the left." At the same time, a similar alarm sounds in the car: "Attention, motorcycle approaching from the right." Not a second too soon, because the driver is tired and distracted. He would probably not have seen the Ducati. But with the warning, he stops in time. Leo Warren turns off – and will soon be home with the family. ■ Admit-

tedly, this scenario is still rather futuristic – warning systems like these are not available for sale yet. But that is set to change soon. Audi and Ducati are working intensively to develop systems that will enable motorcycles, cars, trucks, pedestrians, cyclists, traffic signals and other elements of the traffic infrastructure to communicate directly with one another. C-V2X technology, Cellular Vehicle-to-Everything, should be operational within just two years. It is based on the ultrafast, high-performance 5G mobile communications standard that will revolutionize data transfers worldwide.



The motorcyclist applies the brakes – and a red warning triangle appears immediately in the Audi following behind.

TEXT: Peter Gaide // PHOTOS: Lukas Barth

The traffic jam beyond the curve

The idea is to prevent dangerous situations from arising in the first place. But this requires vehicles that are extensively connected. They each warn their drivers of hazards in real time – even if they are still some distance apart. A traffic jam beyond the next curve, a truck driver who suddenly hits the brakes or a motorcyclist who wants to make a left turn against traffic: Vehicle sensors pick up these signals at a very early stage. If necessary, a warning signal will light up once the information has been received and forwarded. The result is a digitalized network of vehicles with the highest transmission rates that prevents stress, avoids traffic jams and can significantly improve safety. It also paves the way for fully automated vehicles.



“We’re making significant progress,” says Christoph Voigt, Head of Connectivity, Mobile Communications and Car2X Technologies at Audi Development. He also chairs the 5G Automotive Association, or 5GAA for

short – an association that brings together Audi, Ducati and around 90 other companies from the automotive and supply industries as well as the mobile communications sector. Their joint goal is to help 5G achieve a breakthrough on roads. Thanks to its low latency and very high data rates, this new mobile communications standard can effectively map complex traffic situations with many participants and constantly shifting constellations – in real time. “5G allows an extremely fast, error-free exchange of position and vehicle information among road users,” Voigt says. “That wasn’t possible up to now.” The new mobile communications standard is set to be introduced in China first to manage urban traffic flows more efficiently. Europe will benefit as well. An independent study commissioned by the 5GAA developed four model scenarios. They predict a potential net benefit by 2035 of 20 to 43 billion euros from C-V2X throughout Europe, largely due to improved road safety and traffic efficiency.

5G enables an extremely fast, error-free exchange of information among road users.

Watchful observers: the Audi visionaries Christoph Voigt (left) and Gerhard Stanzl.



Increased safety for motorcyclists is the aim of Pierluigi Zampieri, Vehicle Innovation Manager at Ducati.



The future: safe, comfortable and autonomous

The future has already been brought to life in the Bavarian town of Neuburg an der Donau. On the testing area, the C-V2X system – a black box about as big as a medium-sized book packed with cutting-edge mobile communications technology – has been installed in a Ducati Multistrada 1200 Enduro, an Audi Q7 and an Audi A4. The drivers simulate three common situations that frequently lead to accidents: entering an intersection, making a turn across traffic and a sudden braking maneuver by a vehicle in front. Do the systems give drivers prompt, visual and acoustic warnings on their vehicle displays and enable them to apply the brakes in time? ■■■■■

Pierluigi Zampieri monitors the test intensely from the rear seat of the Q7, smiling in satisfaction when the warning signal flashes and the motorcycle is seen even at high speed in critical situations. “Safety is a top priority at Ducati,” says the company’s Vehicle Innovation Manager. “The situations tested account for nearly one-third of all motorcycle accidents. C-V2X is an effective way to help prevent them.” ■■■■■

The technology is part of the long-term Ducati Safety Roadmap 2025. Other features intended to increase safety include airbag systems integrated into the rider’s protective clothing, ABS devices for inclined riding and assistance systems that monitor the blind spot behind the bike using radar sensors. Some of these products are already on the market, and other systems will be introduced gradually starting in 2020. ■■■■■ Safety also plays a prominent role for Audi. “Direct communication between vehicles using

5G enables us to make real progress in avoiding accidents – across manufacturers and on a broad basis. That’s really important to us,” comments Gerhard Stanzl, Head of Smart Mobility/Machine Learning Advance Development at Audi Electronics Venture GmbH. The mobile communications standard is just as important for pushing additional services and developing new business models. Such as for autonomous driving. “With 5G, the high-precision, memory-intensive maps that are needed for automated systems can be transferred to the car very quickly.” This also creates a wide array of opportunities for digital convenience functions that make travel more entertaining and comfortable for the passengers. But Stanzl is not yet prepared to divulge exactly what they will be. A development secret. He grins. “It’ll be great. Just be patient a little longer.”

The exchange of electronic data between a motorcycle and a car is tested on the Audi proving ground in Neuburg.



The tests in Neuburg are part of the ConVex C-V2X project, in which Audi, Ducati, Audi Electronics Venture, Qualcomm CDMA Technologies, Ericsson, the Technical University of Kaiserslautern and Swarco are participating. It is being co-funded by the German Ministry of Transport and Digital Infrastructure through the program “Automated and connected driving on digital test fields in Germany” in the amount of 1.8 million euros. The venture will receive a total of 3.3 million euros in funding and will run until June 2019.

Further information is available at:

[audi.com/talking-business/ducati](https://www.audi.com/talking-business/ducati)



Talking Business – Key Facts

More safety – and lucrative services

- Innovative mobility solutions and new concepts for traffic planning and control are becoming increasingly important when it comes to maintaining the quality of life in urban areas. At the same time, technologies such as 5G and automated driving are enabling the interconnectedness of vehicles and infrastructure, which paves the way for safer, more efficient, more comfortable and sustainable mobility of the future. The fifth generation of the mobile communications and network technology is currently being developed and is expected to be available in many countries from 2025.
- Close cooperation is taking place within the Audi Group. As part of the Ducati Strategy 2025, the company is seeking to increasingly leverage more synergies within the Group to promote topics such as digitalization, electrification and the dealer network – not least with a view to profitability. This cooperation also involves the development of urban solutions and new business models for the premium mobility of the future, including the integration of two-wheel concepts.
- As well as its claim to driving experience and emotion, Ducati is demonstrating its commitment to safety – strategically formulated in its Safety Roadmap 2025. With a focus on the connected bike, the company is introducing features such as radar-based functions that, unlike cameras, work independently of visibility, and the e-call system, which cuts rescue times significantly.

Q8

A1

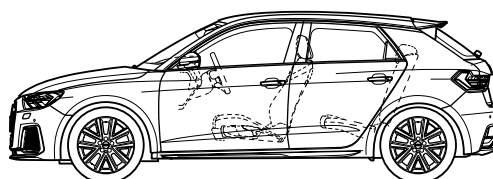
Driving fun, safety and the highest quality: The demands of the broad Audi clientele are high, from the luxury segment down to the entry-level model. Audi sent potential customers on a fast-paced test drive in an Audi Q8 and an A1 – and simply let the camera roll.

Mobility at Audi is becoming multifaceted: One-third of the company's vehicles will be electric in 2025, and two-thirds will still be powered by internal combustion engines. To remain financially strong, Audi will continue to rely in coming years on models equipped with continuously refined conventional drive systems. No matter which drive system the car has, Audi delights its customers with state-of-the-art technologies. Innovations that are initially introduced in higher segments gradually work their way down to other models as well. As a result, all Audi customers can enjoy premium standards and experience technical expertise in models from very different price segments.

From A to Q: the tech experience for all customer segments



Driving fun live: Jonas Schmid and Magdalena Seidenschwarz test the cornering of the Audi A1 and Q8.



Side view of the Audi A1

It is unbelievable just how much high tech you can fit into an A1! “Vorsprung durch Technik” is not just a slogan for the full-size class. An A1 without a smartphone connection to the high-resolution MMI and without rich sound? Hard for the young target group to imagine.

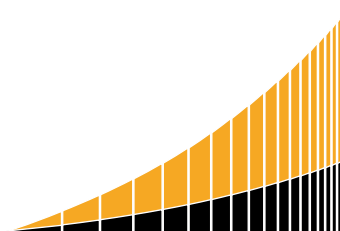
The compact car is turned into a concert hall. Quality is large as life here – for young ears, too. Thanks to the optional Bang & Olufsen speakers. The system controls 11 loudspeakers with 560 watts of power and uses the windshield as a reflecting surface to produce a 3D effect.

“MY FAVORITE SONG CAME ON AS SOON AS I GOT INTO THE CAR – THE SAME SONG I HAD JUST HEARD AT HOME.”

JONAS SCHMID, 19

Potential for a new business model? With the help of the Audi MyMemories app, Audi drivers can take the premium feeling of their Audi driving experience home with them to relive the moments over and over or to share them on social media. The Audi Innovation Research Office in San Francisco developed the app together with the California startup Revl after customer surveys in the United States found that target groups wanted videos of their driving experience.

BANG & OLUFSEN SOUND SYSTEM



Audi A1



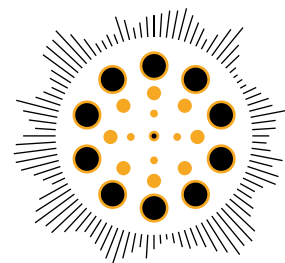
560 W

Audi Q8



1,920 W

Total output



11

23

Loudspeakers

**Driving
fun**



Assistance systems ensure safety:
Armin Muck, Max Brunner and Renate
Seiler (from left) get a vibrant feel for
the road on the curve-filled test track.

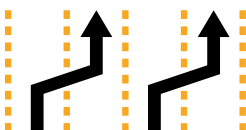


SIDE ASSIST

helps drivers traveling at

15 km/h

or faster to change lanes and reacts with
the help of rear-end radar sensors that can
take measurements extending out about
70 meters: also in the A1 starting mid-2019.



In general, assistance systems can assist the driver with the driving task only within the relevant system limits. The driver always remains responsible for driving the vehicle and is required to be attentive at all times.

Safety

“EVEN THOUGH I’M MORE OF A Q8 CUSTOMER: THE A1 IS REALLY SOMETHING SPECIAL – AN ABSOLUTE CORNERING DREAM. IT’S SMALL, SNAPPY AND FUN – PERFECT FOR YOUNGER CUSTOMERS AS AN ENTRY MODEL.”

ARMIN
MUCK, 50



The circuit is up to
2.2 km
long.

The Audi driving experience center in Neuburg an der Donau.



Whether you are driving in the town or long distances, assistance systems support the driver and increase convenience. One example of technology transfer from the full-size class is adaptive cruise control. It brings the car to a halt in stop-and-go traffic and then automatically starts it again. The system is optionally available not only in the Q8, but in the A1 as well. During test drives, the lane departure warning system and the pre sense front system in both models can provide support in traffic – and are fitted as standard. Another feature of the Q8 is the optional narrowed road assist, which provides longitudinal and lateral guidance when a vehicle drives through construction sites on the freeway.



Quality

AUDI VIRTUAL COCKPIT



12.3"

1,920 × 720 pixels (Audi Q8)

10.25"

1,280 × 480 pixels (Audi A1)

**“I REALLY LIKED THE DISPLAY
SETTING IN THE AUDI Q8.
I WANTED TO TOUCH AND TRY
EVERYTHING RIGHT AWAY.”**

DANIEL
MARR, 31



Further information is available at:

[audi.com/talking-business/tech-experience](https://www.audi.com/talking-business/tech-experience)

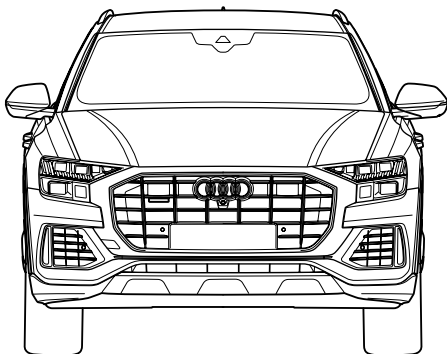
Market introduction of new Audi models in
the Management Report starting on page 114.





The touch display invites you to try it out: Daniel Marr and Awa Jaiteh on their test drive.

“The cockpit in the Audi Q8 is easy to understand and has a very high quality,” Awa Jaiteh says. Brilliantly sharp, high-contrast and glare-free, the display presents all its functions and services in a vivid graphic, from the detailed effects of the assistance systems to images from the reversing camera and dynamic vehicle animations. If you switch to the infotainment mode, you gain plenty of space in a central window for a navigation map or audio, radio and telephone lists. And not to be forgotten: The A1 also comes with a digital cockpit as standard equipment.



Frontal view of the Audi Q8

“Vorsprung durch Technik”: the Audi model initiative

- Audi is creating a new premium experience – in the product as well as in its digital ecosystem myAudi. In this way, young customers develop enthusiasm for the brand and a relationship with it at an early stage.
- Audi continues its model offensive: Following the presentation of the new full-size class in 2018 with models such as the A6, A7 Sportback and Q8 as well as the Audi e-tron, the first volume-built model with fully electric drive, the electrified portfolio will be expanded in 2019. The company therefore presented four new plug-in hybrid models at the first “all-electric press conference” at the Geneva Motor Show: Q5 TFSIe, A6L TFSIe, A7 Sportback TFSIe and the A8L TFSIe.
- In 2025, around every third Audi will be sold with an electric motor or plug-in hybrid drive. The remaining two-thirds will continue to be defined by optimized internal combustion models that will safeguard the company’s financial base. The entire range of models is required here – from the lower to the upper price segments.
- By the end of 2023, Audi will have invested about 14 billion euros in digital, electric and autonomous mobility. At the same time, the Audi Group wants to achieve a long-term, strategic operating return on sales of 9 to 11 percent. Using measures such as process optimization and tapping synergies in the Volkswagen Group as part of the Audi Transformation Plan, the company will free up around 15 billion euros for future-oriented investments over the next five years.

Produced
vehicles 2018

Urus

2,565

Aventador

1,216

Huracán

2,790



The Urus catapults Lamborghini forward

The year 2018 marked the beginning of a new era for Lamborghini. The Urus is becoming the driver of transformation. For one thing, the Super SUV appeals to new groups of customers: More than two-thirds of Urus buyers are ordering a Lamborghini for the first time in their lives. For another, it is fueling cooperation within the Group. Synergies are possible – as reflected in the steadily increasing profitability of Lamborghini.

The foundation of this long-term growth is the plant expansion in Sant'Agata Bolognese. The company has not only doubled its production space to 160,000 square meters, it has also achieved unprecedented production efficiency through state-of-the-art manufacturing technology. That is the basis for additional sales records and opens up new opportunities for cooperation within the Group. These ensure that Lamborghini can drive forward the electrification of its luxury sports cars and make better use of scaling options. For example, Italian engineers are working closely with their colleagues at Audi and Porsche on the development of future electric powertrains. In doing so, Lamborghini is accelerating the pace of development. Thanks to these synergies, the time to market of new models is also being cut to under four years. The derivatives of these models are expected to enter the market in less than three years – in the future as plug-in hybrids, too. “Hybrid supercars will be on the road as early as the next Lamborghini generation,” CEO Stefano Domenicali says. The Italians are guided by the megatrends digitalization and sustainability, but with an

TEXT: Strichpunkt GmbH // PHOTO: Automobili Lamborghini S.p.A.



Lamborghini Urus:
combined fuel consumption
in l/100 km: 12.7;
combined CO₂ emissions
in g/km: 325

**Total increase in
produced vehicles**

2018
346%
2010

interpretation tailored to the company's customers that is based on "trail-blazing products" and "inspiring brand experience," the two main pillars. "Our vision is to become the icon of supercars and Super SUVs," Domenicali says. The Lamborghini Unica app, for example, stands for digital products. Presented in

September 2018, the service allows customers to experience the Lamborghini lifestyle as "informal luxury" through news and events. This fits with the brand positioning as the "icon of luxury" – just as its customized and exclusive services do. Lamborghini delivers sustainability by improving the power-to-weight ratio, for instance: The use of ultra-lightweight materials enables maximum performance with optimized efficiency. Assistance systems ensure that the driver and the car are always safely in control of the situation, whether in city traffic or on the open road. Drivers love their Lamborghini – and this love has a wider impact. While 1,302 of the brand's supercars were sold in 2010, the figure has meanwhile tripled. 3,989 Huracán and Aventador models were sold in 2018, and 1,761 Urus SUVs have been sold since its market introduction in July.

T

Talking Business – Key Facts

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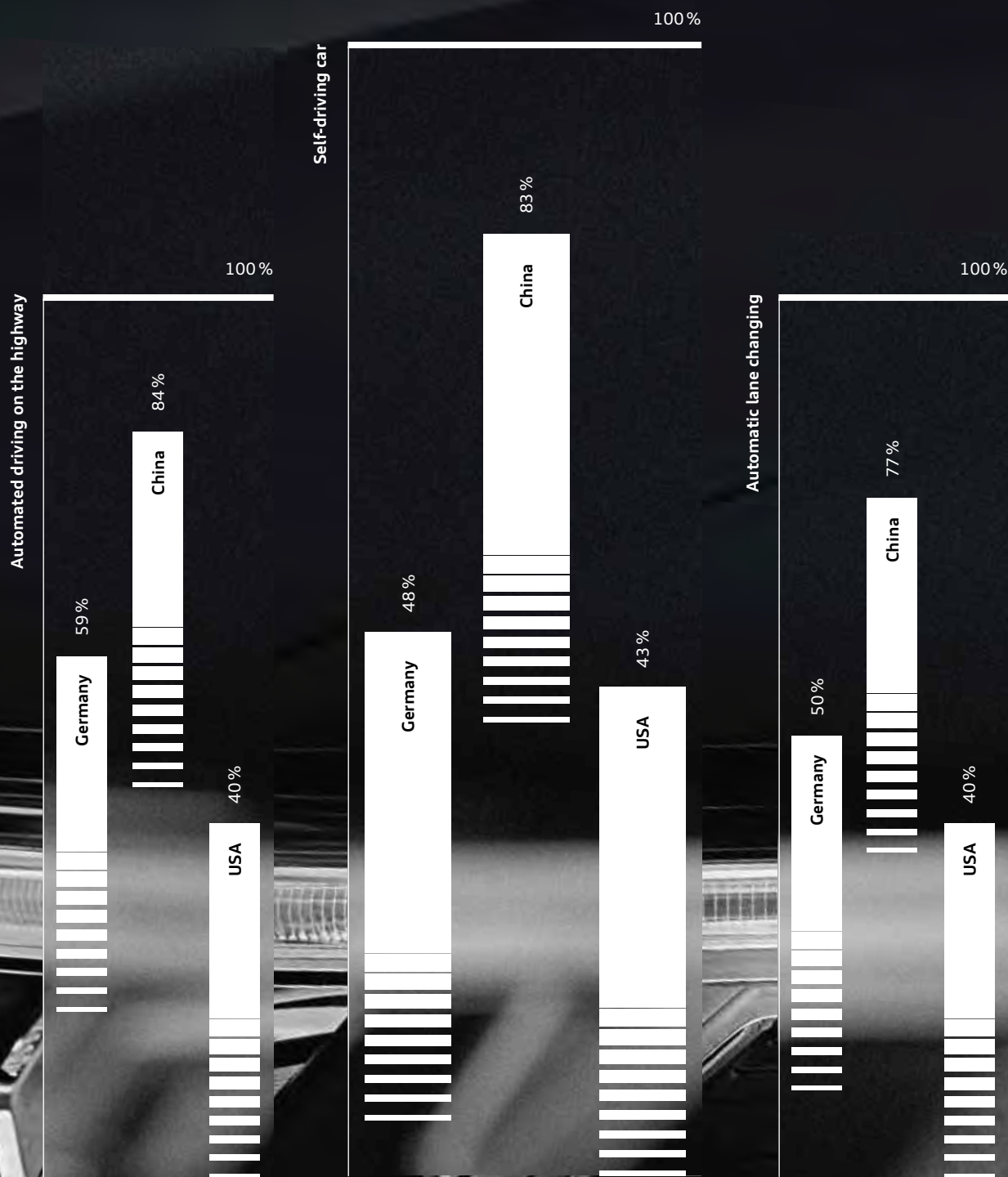
This kind of acceleration cannot be measured with the speedometer

- In 2018, Lamborghini boosted its sales volume by 51 percent in comparison with the previous year. This was made possible by expanding the plant in Sant'Agata Bolognese from 80,000 to 160,000 square meters. Production has doubled as a result. The company sold 3,989 supercars and 1,761 Super SUV models in 2018. In 2019, Lamborghini expects to sell about 8,000 units, more than 50 percent of which will be Urus models.
- The expanded operation and the shared focus within the Group will create opportunities for cooperation. Lamborghini will be able to make better use of scaling options, become more profitable and drive forward the electrification of its hybrid supercars more quickly – for example, by sharing information with intra-Group specialists at Audi and Porsche.
- Lamborghini is shortening the time it takes to develop new models. Time to market has fallen to under four years. The derivatives of new models enter the market in less than three years. The drivers of this development are improved agility and synergies leveraged within the Group.

Further information is available at:

[audi.com/talking-business/lamborghini](https://www.audi.com/talking-business/lamborghini)

The future market China is open to new technologies



General willingness to buy a self-driving car in 2017

Whether autonomous driving or digital services:
The Chinese are particularly open to anything new.

An excursion into the future. In China, the world of tomorrow is emerging today. China's enthusiasm for technical advances has turned the country into the blueprint for the automotive world.

Paved paths snake their way through meadows, shrubbery and trees. Decorative pavilions and small benches offer a place to relax. This tranquil park is located in the Beijing district of Haidian, where hundreds of high-tech companies have made their homes. Baidu is one of them, the company that operates China's largest search engine – and the world's first artificial intelligence park. Here, every visitor can take an individual journey into the future. — At the entrance, visitors stow their valuables and bags in lockers that operate using facial recognition. Afterward, self-driving minibuses take them on an excursion through the 34-hectare park. Anyone who is interested can take Tai Chi lessons from virtual trainers in the augmented reality sections. Joggers can have their running performance monitored by smart streetlights and cameras, and then have their speed, route and calorie consumption analyzed and displayed on monitors. Artificial intelligence is no longer just about robots, says Robin Li, the head of Baidu: "Everyone can do AI." — The days are gone when China, as the workbench of the world, produced masses of cheap products for Europe and the United States. After generating double-digit growth for decades, the country is now one of the leading industrial nations. Today, billions of

by Michael Radunski

Shenzhen, also known as China's Silicon Valley, is considered the epicenter for electric mobility, electronics and telecommunications. The metropolis is one of the fastest growing cities in the world.



euros are being poured into the research and development of cutting-edge technologies. No other country registers as many patents as China. Propelled by the government's strategic plan "Made in China 2025," Beijing has finally set its sights on becoming an industrial superpower. — The interest of the Chinese in new technologies is a plus here. This is reflected in everyday life, for example at the restaurants operated by Haidilao, one of the most popular restaurant chains in China. The lines in front of its locations in such rapidly growing cities as Shenzhen, Chongqing and Guangzhou are as legendary as the quality of the hot-pot dishes in which fish, meat, vegetables and noodles are stewed in broth. Haidilao combines tradition with the technical future in completely automatic restaurants. Robots take orders, cut up the vegetables in the kitchen, filet the raw meat and then serve the food at the tables. The customers appear absolutely delighted with the fusion of the traditional and modern worlds. Food preparation is cleaner and safer as a result. A cook can cut a finger, meat in the pot may not be cooked completely – but all these problems will be eliminated in the future thanks to this "smart" workforce.





“The Chinese are much more open to new technologies than Europeans and Americans are,” says Jeffrey Towson of the University of Beijing. To understand this difference, the expert advises people to just look at what the Chinese hold in their hand: their smartphone. About 700 million Chinese use one today. Always online, always reachable. The Chinese do absolutely everything with their mobile device, with phone calls being the most banal task of all. They chat, watch videos, place orders, take courses and book taxis, hotels and train tickets. Once they are done, they pay for everything with their smartphone, too. “In Europe, people carry cash, and more modern consumers use credit cards,” Towson says. In China, credit cards will never be modern: From luxury hotels to street vendors, a smartphone is used everywhere for mobile payment. Experts call this leapfrogging: when people deliberately skip over a particular technology. —



From mobile payment and big data to deliveries made just minutes after an order is placed – China’s rapid modernization is based on far-reaching digitalization. Users have one top priority: Service must be fast and convenient. This was the secret to success for a startup

called Luckin Coffee. Luckin was not established until November 2017, but since then, the company has grown at a breathtaking pace: Two to three new coffee shops were opened each day during the company’s first months in business. In its first investment round, the company’s founders collected more than 200 million dollars, and now they are launching an attack on the giant in the business: “Starbucks is all about a good location, while Luckin wants to get into your smartphone,” Towson says, explaining the two companies’ different approaches. In the blue-and-white Luckin shops, customers can only use their mobile phones to pay. —

The smartphone has paved the way to success in China. You can see that on the streets of Beijing, too: Here, the companies Mobike and Ofo have made the bicycle rental business attractive again with their digital sharing service. Dozens of bright red bicycles are parked on virtually every street corner. Fixed stations have been taken out of service. Instead, customers use GPS on their smartphone to locate the bikes. When customers scan the QR code located on the bicycle’s fender, they receive a text message with a code to unlock the bike – and off they go. It’s fast, inexpensive, digital and convenient. —

Yet while bicycles still rely on human pedaling power,

**Always online,
always reachable.
The Chinese
do absolutely
everything with
their mobile
device.**

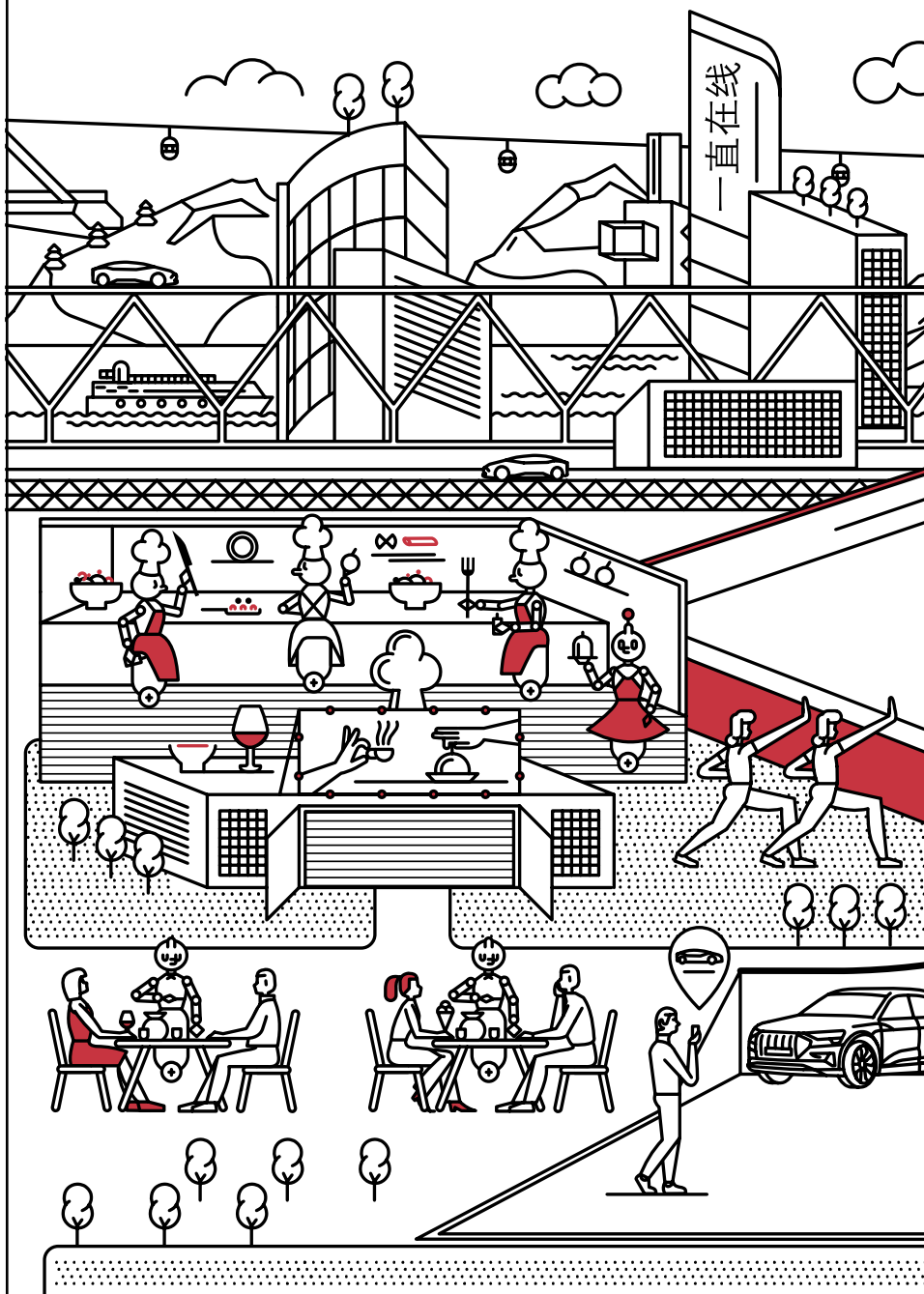
cars are increasingly using energy produced by electric motors. For decades, car manufacturers in China competed against international companies to develop gasoline and diesel engines. But now the rules are changing with the advent of electric mobility.

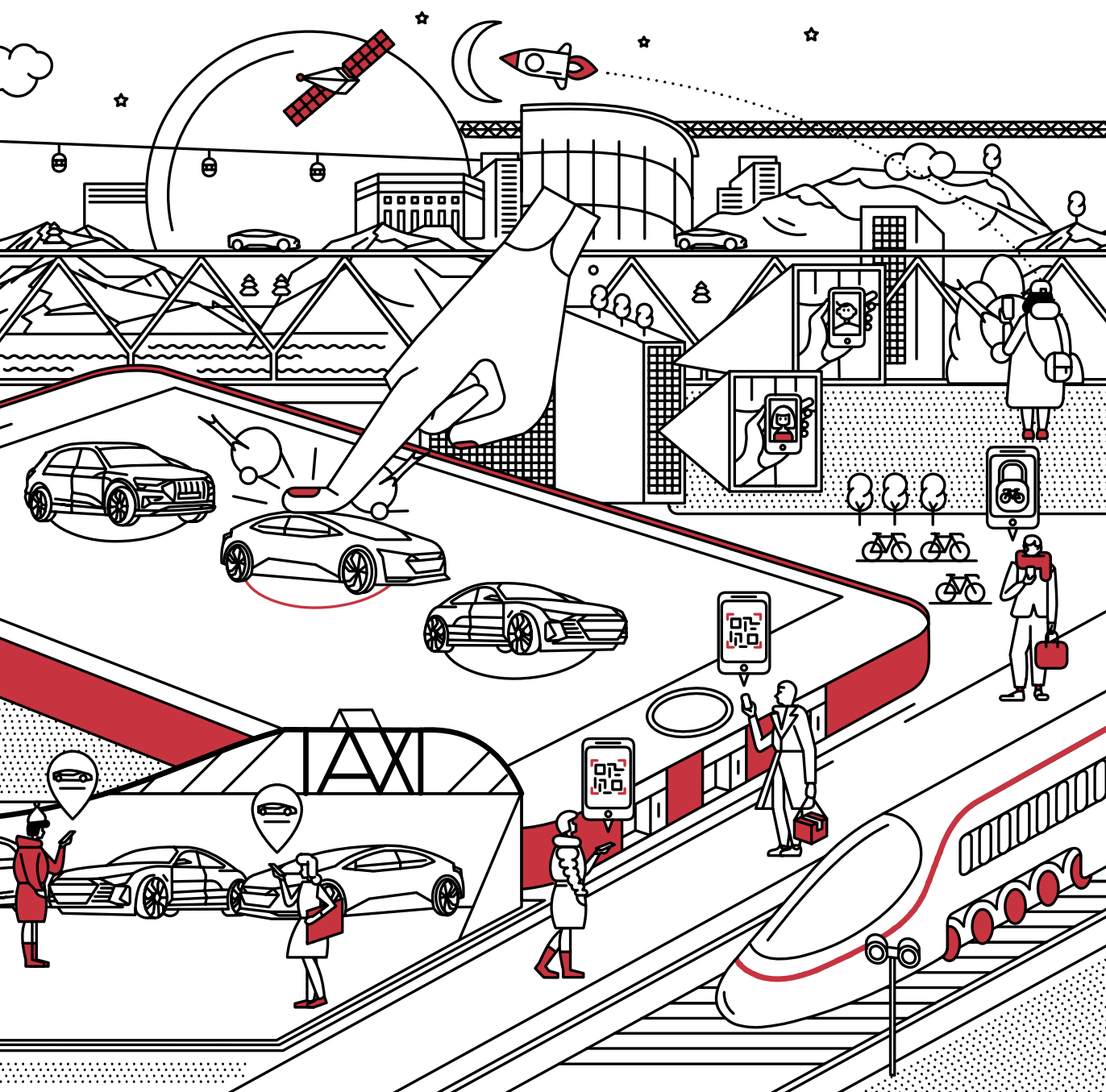
“China can become a world market leader in the automotive industry thanks to new energy vehicles,” says Hu Xingdou, a professor at the Beijing Institute for Technology. “China and the rest of the world can now all start from the same position.” Without worrying that they are only serving a niche market. In 2018, more than one million cars with electric or plug-in hybrid drive were sold for the first time in China. No other country has so many electric vehicles on the road. And this share will climb, due to a government-ordered electric quota. Expressed in simple terms, car manufacturers must now meet the following requirements: Starting in 2019, 10 percent of the vehicles they produce in China must be electric, by 2020 the figure must rise to 12 percent. In 2025, 25 percent of all vehicles sold in China must be electric. In taking these steps, China is becoming the blueprint for the automotive world – not least due to its openness to technological innovations. 83 percent of Chinese would in principle buy a self-driving car, according to the Boston Consulting Group. Only 48 percent of Germans would be willing to do the same. A McKinsey study also found that 52 percent of Chinese were willing to give up car ownership. The main thing is car availability – conveniently orderable via an app. For Chinese customers, what matters is how easily cars fit into their digital world – in terms of general availability and digital connectivity. In other words, in China the car is evolving into a type of smartphone for the road – a genuine mobile device.



Computer on wheels?

The very first computer that most young Chinese ever had was a smartphone. However, the Chinese use their mobile phones less like computers and more like an electronic companion or even a virtual self. Interfaces between the digital and real worlds are plentiful. Chinese use their smartphones not just for chatting, but also to order and pay for clothes, food, vacations and, not least, cars. Loans and insurance policies? Handled by smartphone. The shuttle to the airport? Ordered and paid for by mobile phone. This open enthusiasm is turning China into an orientation market for the technologies of the future.





Further articles on the subject at:

[audi.com/talking-business](https://www.audi.com/talking-business)



“Vorsprung” in Chinese



Alexander Seitz

The CFO and Board Member for China speaks at the celebration in November 2018 marking the 30th anniversary of the partnership between Audi and FAW.



Audi has never had a bigger presence in the blueprint market of China. Specific models, local research and development as well as cooperations are driving the automotive future even faster.

Alexander Seitz is the CFO at Audi – and, alongside Compliance and Integrity, has been additionally responsible for the China business since 2018. This newly created position reflects the country's importance for the Four Rings. "China is the most powerful motor of growth at Audi," Seitz says. The company is fueling this growth by conducting more research locally, by producing more local models and by intensifying existing partnerships and initiating new ones. ■■■■■ In China, the company ranks once again as the number one premium brand. Seitz wants to extend this leading position, for instance by strengthening commitment to the joint-venture partner FAW. "We will draw on our 30 years of experience to introduce even more products tailored specifically to the Chinese market," Seitz explains. Working with its Chinese partner FAW, Audi wants to increase its local portfolio to 12 models by 2022. ■■■■■ Together with FAW, the company has produced about 4.7 million cars since the start of the partnership and delivered more than 5.3 million vehicles in the Chinese market. Since 2008 alone, the brand has increased its sales volume more than five-fold. In the future, the Four Rings want to sell over one million Audi vehicles a year throughout China. The Audi e-tron in particular has great potential: It will be introduced to the market in 2019 and will also be produced in Changchun starting in 2020. ■■■■■ Another step in the localization strategy is the start of production of the Q3 successor at the Tianjin site. Production in Qingdao will also begin soon. As a result, Audi will produce vehicles in four Chinese plants – and there is room to grow. Thanks to their flexible plant structure, these locations could soon be producing more than 700,000 cars annually, depending on market demand. ■■■■■ The long versions of models such as the A4, A6, A8 and Q5 are some of the most popular cars among Chinese customers. Many of the new models, including the Q5 L, Q2 L, A6 L and Q3, have already been customized to meet Chinese preferences and are produced locally.



They all make China the largest sales market for Audi. And Audi wants to further expand this standing in the area of electric mobility. In 2019, the Q2 L e-tron will become the first fully electric car to go on sale – locally produced and tailored to the needs of Chinese consumers. In addition, Audi will assume Group-wide development responsibility as the Center of Excellence for high-voltage battery cells in Beijing. ■■■■■

To keep pace with Chinese customers' wishes and expectations, Audi is expanding the R&D center opened in 2013 in Beijing. By 2023, the number of employees is planned to almost triple. An additional test center with a development department is being built in Wuxi, where Audi is already testing highly automated driving on public streets. Wuxi, a city of 6.5 million residents near Shanghai, was selected by the government to serve as a test field for autonomous driving and smart-city infrastructure. In 2018, the company also received a license to test highly automated driving in the capital Beijing. ■■■■■ Audi is therefore tapping the technological affinity of the Chinese to its own advantage and is expanding its own developmental standpoint. "We want to refine our products even further to meet the needs of our customers, and learn lessons from them that we can apply in other markets," Seitz says. New models are scheduled to be introduced faster. China-specific products will be an even larger part of portfolio planning. In taking these steps, the company is thinking and acting in terms that extend beyond the car itself. The inventiveness and curiosity of the Chinese people as well as the interest of the government offer optimum conditions for developing viable digital business solutions based on fast customer feedback. The Audi on demand+ mobility service, which allows customers to select models from a wide range and drive them themselves, has been available since 2017 and is currently offered in Beijing and Sanya. ■■■■■ To optimally tap the innovative power of new business models, the Four Rings is also opening up to new cooperation models – to generate and use data, for instance. They will include the partnership that the Volkswagen Group has established with the Baidu platform Apollo to jointly prepare autonomous driving in China for market maturity. In the area of shared mobility as well, Audi services are being offered in cooperation with Chinese partners: Together with Shouqi-yueche, Audi launched a premium ride hailing service in 2018. This chauffeur service is currently offered in Xi'an and Chengdu, and other locations will follow in 2019. It can be booked via WeChat. This Chinese super app is used by more than 900 million people. Among other things, it combines familiar functions from Facebook and WhatsApp. ■■■■■ Audi will also strengthen its presence by making structural changes. This is the purpose of a new joint venture with FAW for mobility solutions and an independent Audi Sales Company. A new management model for the Chinese market was also introduced in September 2018 to keep the Audi headquarters in Ingolstadt in the loop in this blueprint market. This shows the importance of the Chinese market for Audi and, thanks to the company's stronger presence there, it has also become a second home for Seitz, the CFO and Board Member for China.



Chinese people are enthusiastic about technology. That is why they are fascinated by Audi.



Further information is available at:

audi.com/talking-business/shenzhen



Audi counts on China. In China

- Premium leadership is decided in China – because it is the world's largest automotive market. More than 23 million vehicles were sold here in 2018 alone. Established OEMs are competing with new, local players. The Audi strategy for China is a growth strategy and is based on the development of the local premium market.
- Working with its Chinese partner FAW, Audi wants to increase its local portfolio to 12 models by 2022. From long-wheelbase versions and the expansion of the SUV model range to the further development of alternative drive systems or new designs, everything is being implemented quickly to increase the attractiveness of Audi for Chinese customers. For example, the brand is launching around 10 new SUV variants on the market, half of which are produced locally. Audi has also announced plans for further electric models in China. The Audi e-tron, the company's first fully electric vehicle, and the locally produced Audi Q2 L e-tron will go on sale in the Chinese market in 2019. In a second step, the Audi e-tron will be produced locally beginning in 2020.
- In 2018, Audi delivered 663,049 cars to customers in China. This represents an increase of almost 11 percent and a higher market share. In the future, the Four Rings want to increase that number to over one million Audi models sold in China. The company is thus building on its long-standing success story with the joint venture FAW-Volkswagen. Audi is also developing further collaborations in order to strengthen its business in China.

Always on

The end of the steering wheel

The Fraunhofer Institute for Industrial Engineering has teamed up with Audi to determine what millennials enjoy about autonomous driving and what bothers them.

Connected to the world's cities, Audi is shaping the future of urban premium mobility – both profitably and with vision.

TEXT: Jan Rentzow // PHOTOS: AUDI AG, Getty Images, Inc.

The test city of Wuxi

In the megacities of the future, traffic will flow because vehicles will interact with the infrastructure.



The car talks to other vehicles. It communicates with traffic lights and electronic signs and it adapts autonomously to the behavior of other road users. In busy cities, it automatically finds the ideal speed and slots into a flow of traffic with no congestion or honking horns. — This car is a vehicle of the future – and is to be found on the roads of Wuxi, China’s model city for autonomous driving. For this metropolis, with its more than six million inhabitants and 1.76 million vehicles, Audi is providing the key technology for making progress in urban mobility: the system for communication between cars and traffic lights, known as Audi Traffic Light Information. Audi is the first international car manufacturer to test Level 4 vehicles – cars at the penultimate level on the way to autonomous driving – in the model region. — The tests rely on C-V2X technology, which is based on swarm data that are exchanged with other road users and the infrastructure in real time. C-V2X stands for Cellular Vehicle-to-Everything and supports intelligent functions for improved

safety, efficiency and comfort. This enables the development of a comprehensive, higher-level system architecture that connects to data platforms and mobile devices – as the Internet of Things. The boundaries between the real and digital world are becoming increasingly blurred. — Audi is researching and testing these very technologies because they are the keys to tomorrow’s success. This all starts with questions: What trends will customers follow tomorrow? What technologies are needed for these new services and processes? What will it cost to provide them? How can they be sold to customers? What benefits will they offer them? With specific customer scenarios, technological opportunities and strategic sales potential can be harmonized – as economically as necessary and with as much vision as possible. — What is being tested in Wuxi will turn Ingolstadt – where Audi has its headquarters – into a model city for intelligent and connected mobility. Road safety will improve, traffic will be controlled intelligently, mobility will become

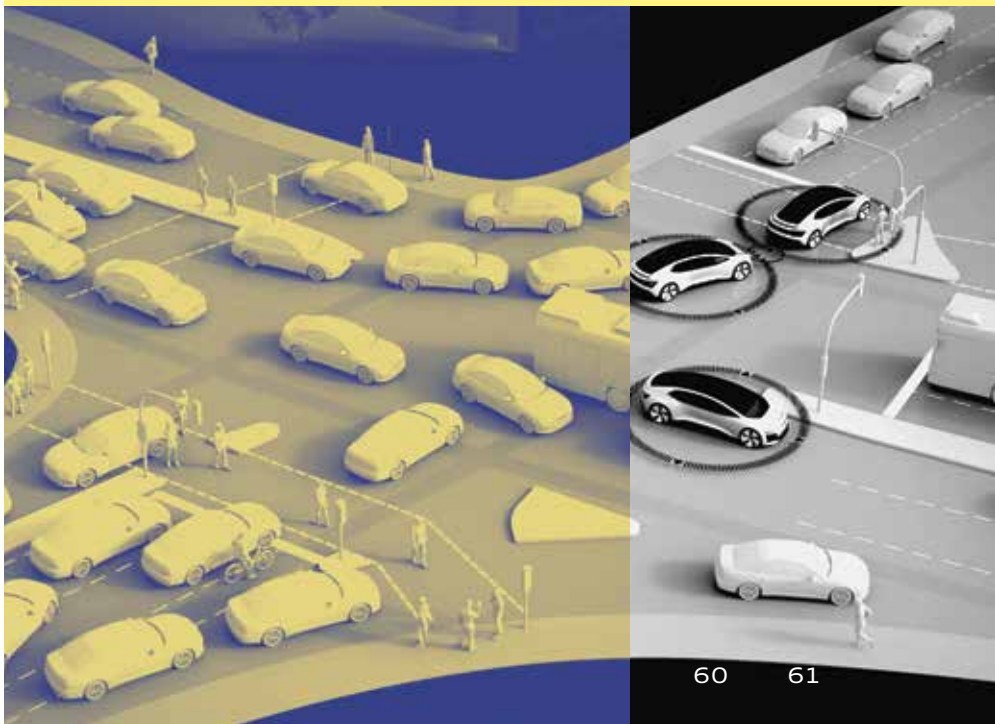
efficient, emissions will be permanently reduced and people's overall quality of life will increase. Much of this will be achieved thanks to autonomous driving. ■■■■ When cars no longer have steering wheels – such as the Audi Aicon concept car presented in 2017 – premium mobility will be redefined. In the future, people will be able to relax and surf the Internet, play with their children or concentrate on their work while traveling from A to B. Working together with the Fraunhofer Institute for Industrial Engineering, Audi is carrying out a laboratory experiment to determine what millennials (those born in or after 1980) find positive about autonomous driving and what bothers them. ■■■■ What's sure to please: arriving earlier. According to a study carried out by Audi and the Karlsruhe Institute for Technology, drivers spend 50 minutes in their cars every day. With fully autonomous traffic and a connected infrastructure, commuting times could be reduced by a third. The condition? Clever traffic management. And at least 40 percent of vehicles would have to be controlled autonomously for traffic flow to improve noticeably. There is another technical condition as well: The ultra-fast 5G mobile communications network, which exchanges data practically in real time, must be rolled out everywhere. Audi is working for this, too, as a founding member of the 5G Automotive Association interest group. ■■■■ China is introducing 5G rapidly. In the future, the Chinese government wants to equip 90 percent of its cities and motorways with V2X technology. In 2025, 25 percent of all vehicles will have Level 4 or



Autonomous driving

In 2017, a fully autonomous Audi of the future was presented with no steering wheel or pedals: the design vision Audi Aicon.

Fewer traffic jams in smart cities? This will be possible as soon as 40 percent of vehicles are autonomous.





Level 5 driving assistants. People do not seem to be afraid of the idea: 83 percent of the Chinese questioned by the Boston Consulting Group said that they would be willing to buy a self-driving vehicle. — As the Audi project in Wuxi shows, autonomously connected driving is the result of cooperation with agile cities that upgrade their infrastructure to keep up with digital developments. There are cities like this outside China, too. Thanks to Audi Electronics Venture GmbH (AEV), its fully owned subsidiary and innovation powerhouse, Audi works together with cities all over the world that want to become smart and permanently improve people's quality of life. — Three Chinese ministries are involved in the partnership in Wuxi. Progress is encouraged at the very highest level with quick decisions as part of a master plan for autonomous driving. When they talk about the partnership between the Chinese government and companies, developers describe the willingness to develop autonomous innovations as "exceptional" and the speed at which public and private data are coordinated early on as "decisive." — Audi is already testing 15 different V2X functions in Wuxi. As of 2019, an additional development and testing center with 150 employees will be in operation here. After all, what happens in Wuxi applies not just to Wuxi and not just to China. Wuxi serves as a model for smart cities all over the world.

Making cities smart

- The trend of urbanization will shape future mobility. Audi is cooperating with cities on various continents to improve the flow of traffic and ultimately the quality of life for all residents. Wuxi near Shanghai is a test area for these smart cities. Audi is the first foreign car manufacturer to test Level 4 vehicles here.
- In Wuxi, Audi is providing Audi Traffic Light Information, a key technology allowing communication between cars and traffic lights. Audi is also testing this communication in Hamburg, in the Italian city of Verona and in Las Vegas and Washington in the USA. Another project in Somerville, a suburb of Boston, is focusing on enabling cars to park autonomously in a new multi-story parking garage. This helps reduce the distance between vehicles and the room needed to maneuver, and results in around 60 percent more space.
- In a smart city with autonomous mobility, commuters can travel approximately one-third faster during rush hour, according to the Audi study "25th Hour – Flow!". The study found that at least 40 percent of all cars must be autonomous in order to achieve a noticeable improvement in traffic flow.
- The Four Rings are a trendsetter for autonomous mobility. The Audi subsidiary company Autonomous Intelligent Driving GmbH is one of the companies working on this technology. In 2021, it will launch a production-ready software module for autonomous driving – for robotaxis and, potentially, for autonomous private cars.

Further information is available at:

audi.com/talking-business/smart-city

Responsible action becomes a competitive advantage



Worldwide investments in sustainable assets

The interest in sustainability aspects is particularly evident in Europe.

How can the automotive industry get back into the fast lane?

Innovative and agile companies know when the time is right, activate the turn signal and accelerate boldly.

Together with Reto Ringger, a value-driven asset manager and CEO of Globalance Bank, Audi CEO Bram Schot looks at how companies can speed up processes and make decisions more quickly – and why the capital markets reward this decisiveness.

At the moment, the capital market has a skeptical attitude toward established car manufacturers. New players, such as Tesla, inspire imagination. Why is this?

Schot Without Tesla, we wouldn't have made as much progress in the area of electric mobility as we have. I have a lot of respect for what Tesla has achieved. With almost two million cars a year, however, Audi exists on a different scale and has a different business model. We have an ambitious Roadmap E, which begins with the Audi e-tron. It is the game changer in the area of electric mobility. Cutting-edge technology in an impressive design – it's simply irresistible.

Ringger I can't wait. To see the car and find out the extent to which Audi's long-term success is linked to the success of the e-tron.



Bram Schot (right) and Reto Ringger in conversation about value-oriented corporate management and about what status electric mobility will have for the future of the automotive industry.



S With the e-tron and the e-tron Sportback, which will also appear in 2019, we are opening the door to a new era. It's not just about how many market shares electric vehicles have tomorrow or the day after. Conventionally powered cars still make up the basis for our success. This will change gradually – depending on how our customers take to electric mobility. However, what's also clear is that it's not just the means of propulsion that is changing. In the past, the focus was on the car as a product and everything else was grouped around it. Today people are creating environments for themselves in which the car, although still important, plays an integrated role. This is new.

R This calls upon car manufacturers to question their own self-image. Building great cars is no longer enough. Car manufacturers need to completely reinvent themselves as providers of mobility. When I see which companies are truly dynamic, innovative and successful, then it's usually those that are still managed by their founders. Just look at Amazon, Facebook, Google and Alibaba. Apple was like that, too. These entrepreneurially managed companies change the rules of the game. In comparison, companies run by managers seem like plodding giants. How do you avoid this sluggishness at Audi?

S It is indeed a huge challenge to keep up with this speed. Technology alone is no longer our USP. In this volatile world, the right people and culture are crucial. They allow us to change a lot more than before – the difference between what is conceivable and what is achievable was never as small as it is today. Our imagination is the only limit.

R Exactly. The challenge for a CEO is to attract employees with these abilities. Out-of-the-box skills – in other words, the ability to think creatively and unconventionally without limits – are becoming more and more important. As an entrepreneur and also as an investor, I notice again and again that the importance of culture exceeds the importance of strategy many times over. The well-known consultant Peter Drucker once said in this regard: "Culture eats strategy for breakfast."

S That is why I asked my team for their feedback when I became the new CEO. In the process, we came up with lots of ideas that move our company forward. Every manager has a role to play in order to make this a success. They have to be role models, be present, evaluate, coach and build up confidence within the team. Honesty and trust must be the basis for this. But not everyone must do everything perfectly. For me, the courage to experiment and make unpopular decisions is more important.



Reto Ringger tests the new Audi e-tron.

R Because risk-taking is not the most marked characteristic of large companies?

S Right. The car industry is not sufficiently willing to take risks and is too complex. We must reduce complexity while speeding up innovations, either in-house or with partners. I am convinced that excessively rigid planning stifles new ideas. Robust, innovative and above all agile companies will be particularly successful when it comes to making the necessary change. The skills and motivation of employees are the differentiating factor.

How do you ensure the support of Audi employees?

S It's not about changing employees, it's about inspiring them. Plan, plan, plan must become play, play, play. A shared mindset is the most important thing. We need to revive the Audi spirit. In order to do this, we need a more flexible organization. Success depends on speed. And speed requires simple processes. Simple and clear processes come from confident people. We need more collective intelligence and less hierarchy. This is what we Dutch are good at: flat hierarchies, being approachable, experimenting ...

And everything under the watchful eye of investors on the capital markets. Are you annoyed by their current lack of confidence as regards the future of car manufacturers?

S No, the capital market rewards a firm future outlook, especially if company development is consistently geared to it. This creates trust. We are currently working to achieve this clear picture and are consistently aligning Audi with this through our strategy as well as our measures for strengthening the brand. I do not want aggressive volume policies. I would rather sell fewer cars but earn more money with exactly those products that inspire customers. In the run-up to the Annual General Meeting in May, we have defined the action areas, indicators and corresponding goals which we will use to measure our progress in the years ahead.



The Audi e-tron marks the start of a new era – Audi CEO Bram Schot is convinced of it.

R For 25 years, I have looked at how sustainability is rewarded or penalized by stock markets. The word “sustainability” has unfortunately become just another empty cliché. I prefer the term “future viability.” And the stock market tells us where the future is happening. Stocks are bought because investors think that companies can tackle the new business, social and ecological challenges and quickly adapt their business model. The automotive industry is facing major challenges in this regard, and car manufacturers have to have three responses to them. First: Yes, we have understood. Second: Yes, we can implement that quickly and competently. That is why we – third – will be one of the winners as a result of the change. In the end, it is not words that count, but actions. Then future viability that is demonstrated through action will also be rewarded by the stock market.

S Audi is therefore on the right track. After all, we have understood, we are implementing and we are using the change that is taking place in our industry as an opportunity for our company. It is not just a matter of innovations – it is also about focusing. We will consistently align our business with what customers want. And we need to become more feminine, younger and more international. After all, a large part of our growth will continue to come from China. We need to optimize costs and sharpen the brand. Because Audi is a strong brand. And I am convinced that we will make Audi the benchmark again.

The Audi e-tron electrifies: Reto Ringger and Bram Schot after the test drive.



Further information is available at:

[audi.com/talking-business/CEO](https://www.audi.com/talking-business/CEO)

Water: saved

Audi México treats all its waste water before feeding it back into the San José Chiapa plant's water system. After being treated, the hygienically clean water is reused in production – or to water green areas, for example. The next step is an even greater saving in groundwater consumption.

In the loop: Audi promotes the circular economy

Sustainability is the foundation of economic activity. Audi is therefore working continually to reduce its ecological footprint, for example through the responsible handling of resources. The vision is a closed circular economy: reduce, re-use, recycle.



REDUCE

>> ANNUAL REDUCTION IN GROUNDWATER
USE AT THE SAN JOSÉ CHIAPA PLANT IN
MEXICO

In order to achieve the ambitious goal of a circular economy, Audi thinks holistically – and this starts in production. The vision is to manufacture vehicles at all Audi sites without producing any waste water at all. The San José Chiapa site in Mexico serves as a model. **Reuse** is another part of the circular economy: Remanufacturing is the industrial overhaul of used parts to produce parts of original quality. This process and the sale of these parts through our spare parts business generates significant added value. And not just environmentally, but also economically, since it saves money. The program for remanufacturing these parts uses digital diagnostic methods to detect, analyze and correct mechatronic anomalies. The program is currently being tested on transmissions and will be extended to other spare parts in the future.

REUSE

>> SAVING RESOURCES AND REDUCING COSTS WITH REMANUFACTURING

80 %

Resource savings

45 %

Cost reductions
transmission

39 %

Cost reductions
mechatronics

Transmission: remanufactured

Do electronics in modern devices make repairs impossible? On the contrary: Digital diagnostic methods can be used to detect, analyze and solve mechatronic problems. Repairing instead of scrapping.

Batteries: recycled

Valuable raw materials such as lithium and cobalt are needed for electric car batteries, and battery manufacturing is very energy-intensive. Audi will thus focus even more in the future on sustainability along the supply chain and has also joined forces, for instance, with the Global Battery Alliance. The initiative is concerned with sustainable recycling concepts in the sense of a circular economy as well as innovations that promote the sustainability of the battery.

By 2025, one in every three Audi vehicles sold will be electric. The demand for batteries will therefore increase in the future. Audi is taking steps to make the life cycle of these batteries as sustainable as possible and has been an active member of the Global Battery Alliance since 2017. The alliance focuses both on the protection of human rights and social standards when extracting raw materials as well as on the creation of solutions for reusing lithium-ion batteries. Audi also enters into research cooperations, for example with the recycling group Umicore, in order to develop a loop for parts of high-voltage batteries that could in this way be reused again and again.

RECYCLE

>> TARGET RECYCLING QUOTA FOR COBALT, NICKEL AND COPPER IN COOPERATION WITH THE UMICORE RECYCLING GROUP



Audi also uses aluminum for its battery housings. This light metal is obtained from bauxite in a process that is very energy-intensive. In order to save resources and energy, Audi has launched the Aluminium Closed Loop project, in which offcuts are returned to suppliers and recycled. In 2018 alone, some 70,000 metric tons of CO₂-equivalent emissions were saved this way. Audi is the first car manufacturer to be awarded the Aluminium Stewardship Initiative (ASI) sustainability certificate for the sustainable production of battery housings. — These are just a few areas where Audi is focusing on sustainability in order to close material loops as part of a circular economy. And they show that it is possible.

Further information on sustainability aspects in the Management Report starting on page 128.

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Talking Business – Key Facts

B

Audi on the way to the circular economy

- At Audi, sustainability means future viability and is the foundation of all economic activities. The company supports the United Nations' Sustainable Development Goals (SDGs).
- Audi is a member of various initiatives, associations and working groups, for example the Global Battery Alliance and the Aluminium Stewardship Initiative (ASI), working with stakeholders to address ecological, economic and social issues.
- The company considers a car's entire product life cycle, not just its emissions during use. By the end of 2025, Audi wants to reduce the environmental impact of Group sites by 35 percent per car produced compared with the reference year 2010. One long-term goal is the closed circular economy.
- The Audi vision is to produce vehicles at all sites with no CO₂ emissions or waste water whatsoever. The Brussels (CO₂-neutral) and San José Chiapa (no waste water) plants have already achieved this goal.



Meeting place:

Data:Lab in Munich,
the digital forge of the
Volkswagen Group.



TEXT: Michael Prellberg // PHOTOS: Julian Baumann



Next? IT!

From enabler in the background to strategy-driver: Audi CIO Frank Loydl discusses the new role of IT with Sabine Bendiek, Managing Director of Microsoft Germany.

Microsoft is one of the world's most valuable companies. Five years ago, that seemed unimaginable. What does it take for investors to support this successful transformation?

also in terms of the willingness to invest. Microsoft views information technology as a fundamental facilitator of new forms of collaboration in which people interact with machines intuitively. Digital transformation means that IT is present in every product and in nearly every situation in life, in one form or another.

Bendiek A lot of patience and trust. We were transparent about the goals we want to achieve – and showed that we are achieving them. This generates positive momentum,

Frank Loydl, does the transformation at Audi also require perseverance?

Loydl Yes. However, IT and digitalization are Microsoft's core business. At Audi, the core business is mobility, and that is strongly tied to hardware. In general, IT is the key driving force behind the company's transformation. In strategic terms, we view things from three perspectives: Part one is the car as a product and the product-related IT. Part two involves connect services and new digital business models. Part three affects the existing company IT. We can't lump everything together. The main change involves leaving behind the silos of individual business divisions like "IT for Development" or "IT for Production" and intelligently orienting ourselves toward specific fields of technology. Since we're not starting from scratch, we launched the transformation project NEXT:IT to migrate Audi IT from the existing structure to this new one.

B Making the interfaces between divisions more flexible is the right approach. That's the only way that agile cooperation is possible. It is also important to understand the requirements of the divisions at such interfaces and let the employees actively help shape things so that IT can really provide the support needed.

L And that puts us right in the middle of the transformation. It's important to us to gain the support of as many participants as possible – not as spectators, but as players. This is certainly a challenge in the automotive world, which is still strongly rooted in industrial hierarchal structures.

B Transformation needs technology as a means to an end. But people remain at the center of it. So it's also the managers' job to bring together many of the demands on IT. We're asking: How do you deal with people? How do you succeed in approaching entire teams and gaining their support?



Sabine Bendiek

has been Managing Director of Microsoft Germany since 2016. Bendiek, who graduated from MIT (Massachusetts Institute of Technology), entered the IT industry after various stations as a business consultant. Before joining Microsoft, she was a manager at Dell and Managing Director of EMC Deutschland.



Frank Loydl

joined the IT industry after graduating in computer engineering. In 2013, he joined Volkswagen, where he took over IT management of the Group and was responsible for software development. Loydl has been CIO of Audi since February 2018.

L Exactly. I think a shared system of values is needed for the transformation, one that everyone in the company can refer to – such as respect, courage and openness. This reduces conflicts of goals because people can connect quickly at the values level. Under these conditions, we can introduce agile ways of working into the organization sustainably while simultaneously strengthening the individual skills of individual employees. Nonetheless, I don't think 100 percent agility makes sense. Instead, we want to use "hybrid agile" work models, in other words models that are flexible and dependent on the specific task. For me, barrier-free and value-oriented cooperation is the most important key to success.

How crucial are digital tools to the unfolding of these opportunities?

B They can play an important role. Collaboration platforms help change the ways we work and help us develop continually.

That takes a combined process: I have a new technology, I change my managers' way of thinking and I motivate a broad range of employees to live this new world of communication.

L We are working intensively Group-wide with external partners such as Microsoft, for instance in cloud development. And we are in the process of adding Office 365 and therefore new tools for collaboration to complement our proven cooperation tools. We intensively share experiences about how we can achieve maximum benefits from these IT solutions – across divisions and national borders. Co-innovation will increase speed, quality and also efficiency at Audi. Depending on the topic, we will strengthen value creation in-house or develop digital products or platforms together with partners such as Microsoft in order to offer our customers added value.

In this new world, people increasingly work on a cross-company basis.

Sometimes you're a customer, sometimes a partner.

How does that work between Audi and Microsoft?

Audi on the way to NEXT:IT

- The strategic role of Audi IT as the primary driver of the digital transformation throughout the company focuses on three areas: first, on the car as a product and product-related IT; second, on new digital products and services and third, on company IT that manages processes in the background.
- The goal of the transformation project NEXT:IT is to establish more agile processes and to reposition IT at Audi – according to technologies, not divisions. In addition, different work models are to be adapted so that they optimally match the individual task. The catchphrase is "hybrid agile."
- Audi is counting on connected platforms throughout the Volkswagen Group. Topics such as the connected car are mapped throughout the Volkswagen Group to achieve maximum synergies.
- Moreover, Audi is increasingly entering into cooperation with other companies. This enables development work that is faster and more effective.

Retail in transformation? Retailers in transformation!

Around 5,000 retail and service partners around the world make the Audi premium brand a living experience. This established sales network creates a strategic competitive advantage. With the help of numerous initiatives such as the Audi Retail Experience, retail and service are aligned with the mobility of the future.



Audi Expert

J A V I E R
C E G O Ñ I N O
L Ó P E Z

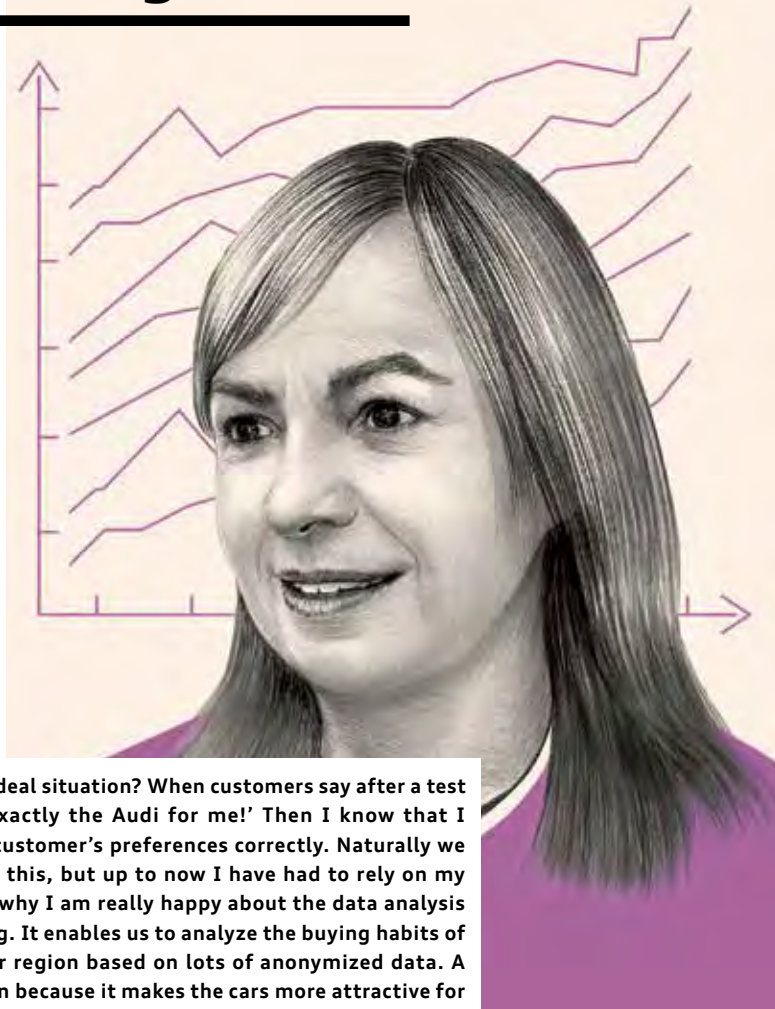
AUDI EXPERT /// SARAGOSSA, ESP

» _____ We get customers excited about Audi. That has always been our favorite job, but now it is officially at the heart of the Audi Retail Experience. This lets us live out our passion for premium automotive technology to the full. As an Audi expert, I share a unique product and brand experience with the customer. Sales pressure? It drops. We can show live during test drives just how assistance systems support the driver. When we hand over the vehicle, we explain how it works and join customers as they take their first steps into the digital world of Audi. Service doesn't get any better than this. I'm proud of that. _____ «

TEXT: Peter Gaide // ILLUSTRATIONS: Aistė Stancikaite

"The stronger the bond with the customer, the more Audi profits, too," says Horst Hanschur, Head of Sales Strategy/Retail Business Development. This is why Audi counts on a network of dealers and importers who are as much at home in the automotive future as the Group itself. Digitalization, electric mobility and mobility services are the three action areas that will shape the field of sales more strongly

ProfitMining



in the future. _____

New dealer contracts reflect this change and include activity-based pay in addition to the basic salary alone. This is about more than just car sales: It is about playing an active part in customers' mobile, increasingly digital lifestyles when it comes to their cars. In this way, Audi is laying the foundation for its dealers' future profitability. For example, with ProfitMining – a tool with which data and therefore customer needs can be analyzed. _____ To achieve its financial goals, Audi worked with importers and dealers to develop the Audi Retail Experience concept. It includes a flexible, customer-focused retail journey that seamlessly connects the online and offline worlds.

» _____ The ideal situation? When customers say after a test drive: 'This is exactly the Audi for me!' Then I know that I understood my customer's preferences correctly. Naturally we always try to do this, but up to now I have had to rely on my feelings. This is why I am really happy about the data analysis tool ProfitMining. It enables us to analyze the buying habits of customers in our region based on lots of anonymized data. A win-win situation because it makes the cars more attractive for our customers and, at the same time, reduces the amount of time they stand at our dealerships and therefore also the capital tied up. Since October 2018, I have been one of nine Spanish dealers who are testing ProfitMining. I have already noticed: It's worth it! _____ «

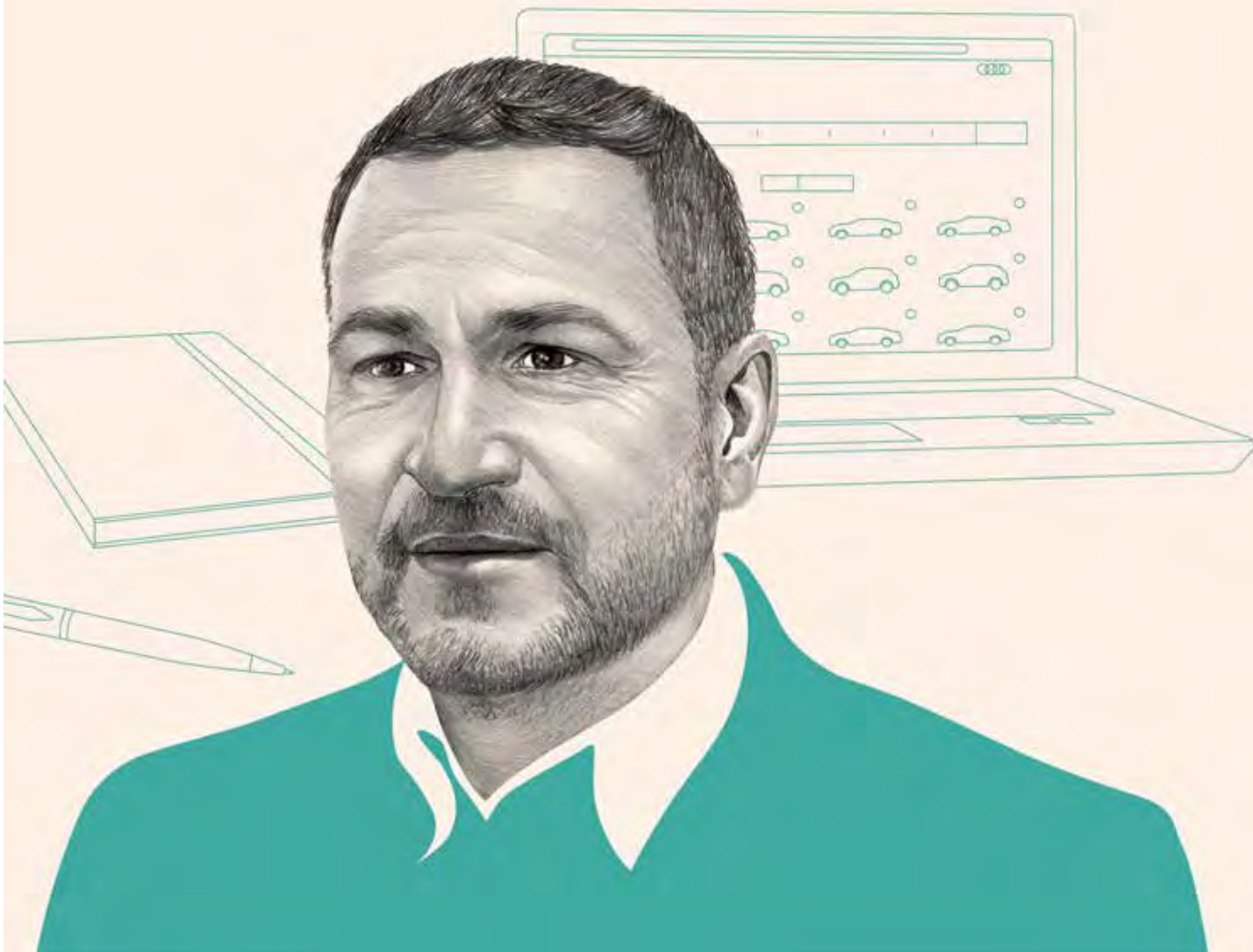
C O N X I
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C O M M E R C I A L D I R E C T O R ///
B A R C E L O N A , E S P

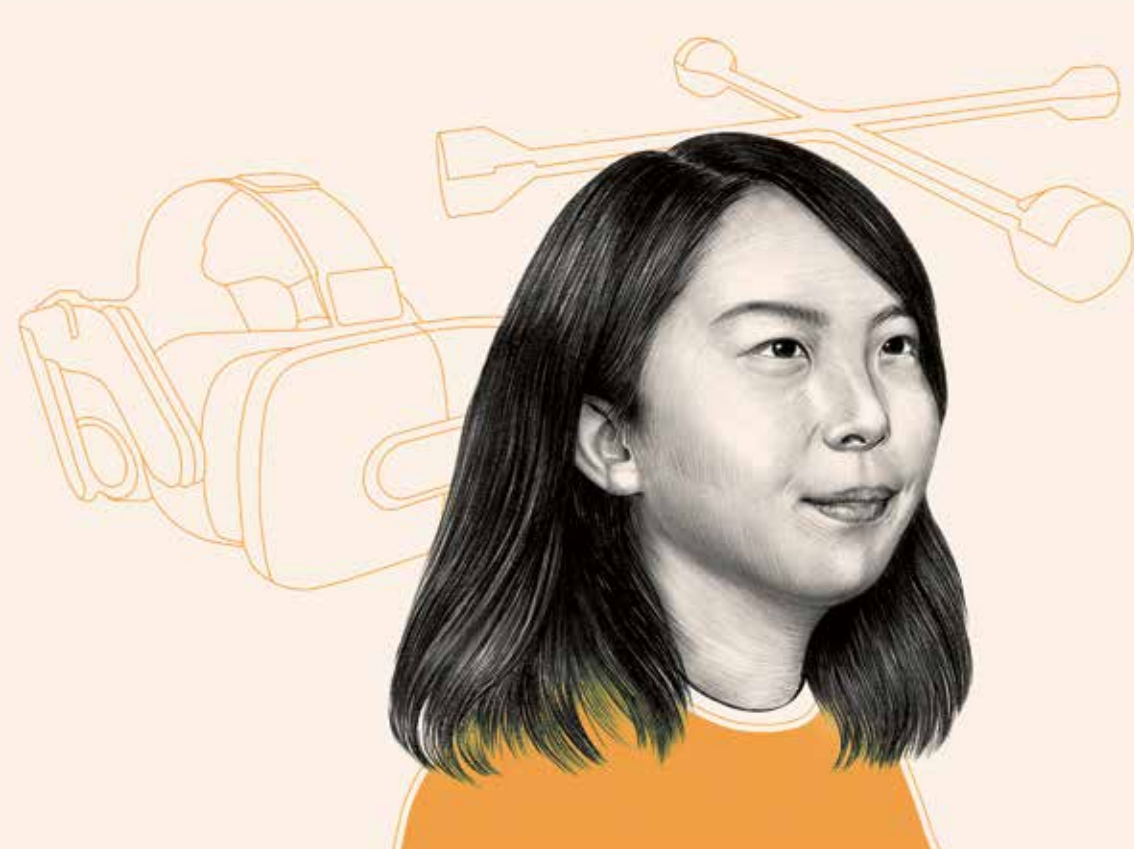
E-commerce

GENERAL SALES MANAGER USED CARS ///
AUDI ZENTRUM FRANKFURT, DEU

C A R S T E N
R I C H T E R

» _____ The Audi Zentrum Frankfurt was one of the first in a group that now consists of more than 100 contract partners in Germany, where customers can buy and finance cars from Audi Approved :plus. Online, around the clock. Although the traditional customer still wants to see the car and take it for a test drive before buying it, the Internet is becoming increasingly more important as a sales channel. Our Audi Zentrum was involved in the development of the e-commerce project from the very beginning, because we dealers are very familiar with our customers' wishes. Many of them want fast handling and delivery. In the future, the used-car market will become even more attractive through functions on demand, because customers can have the desired functions activated later on. That is a further bonus for customers – and for us as contract partners. _____ «





Training

» _____ Our dealers in China really know their way around internal combustion engines. Electric motors are new in the Audi range. That is why customers also approach the dealers with lots of questions – and dealers must be able to provide the right answers. It is my job to train them for this task. This training program is largely digital: In technical training, Audi has a series of effective digital learning formats that dealers can access flexibly and regardless of location via a cloud-based platform. The spectrum ranges from web-based training and self-study programs to Audi Service TV clips and, in the future, augmented reality training on tablets. Most recently, I can also prepare dealers for electric mobility in live training sessions using virtual reality headsets. I call that 'Vorsprung'! _____ «

Y A W E N

TECHNICAL TRAINER FAW-VW ///
C H A N G C H U N , C H N

At its core is the desire to create a special brand experience that the customer will have only at Audi. The key principle: Customers can tailor their individual advice and purchase experience to their priorities and receive the best offer for their individual circumstances. _____ Dealerships are increasingly becoming places where customers can discover all technological and emotional aspects of the Audi brand individually. The dealer is the central touchpoint with the customer in the physical world and the person who provides comprehensive information as well as an exciting product and brand experience. Naturally, the same service standard and brand identity are offered to Audi customers across all countries and continents.



Audi on demand

» _____ Our business model has progressed from that of a traditional Audi dealer to that of a wider provider of comprehensive mobility services. That's due to Audi on demand. Customers can choose from a range of high-profile models allowing a short-term experience of the Audi brand. This flexible mobility solution can be booked online or via smartphone, allowing the user to experience a digital all-inclusive offer. The booking period is between one hour and 28 days, giving choice and flexibility. What brings me to offer Audi on demand? It allows me to better utilize my own fleet and to leverage customer bookings efficiently and profitably through this flexible mobility alternative. The future uses of this solution are extensive and will see us better adopt a one-fleet approach within the business. _____ «

C A M E R O N
W A D E
FRANCHISE DIRECTOR ///
LOOKERS AUDI, GLASGOW, GBR

New roles complement established job profiles. Audi is training its sales partners to act as hubs for digitally based mobility services such as Audi on demand. This premium mobility service can be tailored to local customer needs. In London, for example, Audi partners serve as a first stop, while in Hong Kong the service is available in private residential complexes, Audi showrooms and an exclusive shopping mall. The company is continuing to expand Audi on demand worldwide. _____ The more active a retail partner is in such consulting and sales processes, the higher the partner's compensation will be in the future. "This is the only way we can create a seamless customer journey from which customers, Audi and dealers will profit," the sales strategist Hanschur says.

T

Talking Business – Key Facts

Retail as a competitive advantage

- Through its global network of around 5,000 retail and service outlets, Audi enjoys a strategic competitive advantage and offers a place where customers can physically experience new technologies and mobility services. The focus is on market penetration, and this is a key part of the Audi Transformation Plan.
- The role of Audi dealers is changing and shifting increasingly toward the action areas of digitalization, electric mobility and mobility services. New contracts with dealers reflect this transformation.
- In the digital era, customers demand seamless, individual care at all times and via all sales and communication channels. This is exactly what the Audi Retail Experience provides. It is a win-win situation: maximum convenience for customers and attractive business potential for Audi and the sales network.

B

Financial events 2019

March 14, 2019

Annual Press Conference

May 3, 2019

First Quarter Report

May 23, 2019

Annual General Meeting

July 26, 2019

Interim Financial Report

October 31, 2019

Third Quarter Report

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