

Audi

2010 ANNUAL REPORT



New departures

The next chapter in mobility.

Audi Group Key Figures

		2010	2009	Change in %
Production	Cars	1,150,018	932,260	23.4
	Engines	1,648,193	1,384,240	19.1
Deliveries to customers	Cars	1,293,453	1,145,360	12.9
Audi brand	Cars	1,092,411	949,729	15.0
Germany	Cars	229,157	228,844	0.1
Outside Germany	Cars	863,254	720,885	19.7
Lamborghini brand	Cars	1,302	1,515	-14.1
Other Volkswagen Group brands	Cars	199,740	194,116	2.9
Workforce	Average	59,513	58,011	2.6
Revenue	EUR million	35,441	29,840	18.8
EBITDA ¹⁾	EUR million	5,452	3,379	61.3
Operating profit	EUR million	3,340	1,604	108.2
Profit before tax	EUR million	3,634	1,928	88.5
Profit after tax	EUR million	2,630	1,347	95.2
Operating return on sales	Percent	9.4	5.4	
Return on sales before tax	Percent	10.3	6.5	
Return on investment	Percent	24.7	11.5	
Total capital investments	EUR million	2,146	1,844	16.4
Capitalized development costs	EUR million	630	528	19.2
Depreciation and amortization	EUR million	2,170	1,775	22.2
Cash flow from operating activities	EUR million	5,797	4,119	40.7
Balance sheet total (Dec. 31)	EUR million	30,772	26,550	15.9
Equity ratio (Dec. 31)	Percent	36.8	40.0	

1) EBITDA = operating profit + balance from impairment losses (reversals) on property, plant and equipment, capitalized development costs, leased assets, goodwill and long-term investments as per the Cash Flow Statement

*Dear Readers,
Dear Shareholders,*

2010 will be remembered as a turbulent year, but we at Audi will remember it as a thoroughly positive one. We have witnessed the global economy recover with surprising speed, but we are also aware that the dynamics of the individual markets vary considerably. That makes us even more proud of the determination with which Audi has stuck to its chosen course. We posted a new record for deliveries to customers, something that nobody would have imagined possible at the start of the year. And our key financial figures also reached a new record level.

From our top-of-the-range A8 to the elegant A7 Sportback, and from the A6 business sedan to the compact newcomer A1: The year 2010 arguably brought the most emphatic display yet of our premium credentials. These cars will have a sustainable impact on how our brand is perceived – and they are the essence of our continuing growth.

Our Company is also projecting its brand values into tomorrow's world. With models such as the Q5 hybrid quattro and the e-tron family, our solutions for future forms of individual mobility are already electrifying people today. And in launching the architecture competition Audi Urban Future Award, we have created a think tank for the city of the future that bears our very own, distinctive Audi imprint.

Audi is ready for the dawning of a new age. The challenge now is to realize our visions, assume social responsibility and identify and define the topics of the future. In short, we will be a pioneer.

That spirit is also the overriding tone of this year's Annual Report. Famous authors address the theme of a new beginning from various angles. People who take on and rise to challenges; technology that revolutionizes and excites. Let yourself be inspired.

I wish you an entertaining and exciting read.

Kind regards,



Rupert Stadler
Chairman of the Board of Management





Prof. Dr. rer. nat. Martin Winterkorn
Chairman of the Supervisory Board

*Ladies and Gentlemen,
Dear Shareholders,*

Fiscal 2010 was characterized by the global economy's unexpectedly swift recovery from the consequences of the financial and economic crisis. Global demand for automobiles surged ahead, mainly thanks to the very dynamic performance of Asian markets, but also to an improvement in the car market in the United States and the major markets in Latin America.

The Audi brand brought numerous new products onto the markets in the course of the past fiscal year, among them the new Audi A8, the Audi A1, the A7 Sportback as well as other models, and again delighted its customers with a steadily growing, attractive product portfolio.

The Audi Group consequently set new all-time records for the Company: As well as building more vehicles than

ever before, it established a new record for deliveries to customers in selling 1,092,411 Audi vehicles. The Audi Group thus substantially improved its key financial indicators and posted new record highs for revenue and operating profit. In 2010 the Company was yet again one of the most profitable premium manufacturers in the international automotive industry.

This success of the Audi Group is principally down to the huge commitment of all the people who work for it. The Supervisory Board takes this opportunity to thank all involved for working so effectively over the past fiscal year.

There were the following changes on the Supervisory Board of AUDI AG in 2010: With the close of the Annual General Meeting on May 20, 2010 Wolfgang Förster, employee representative, retired from the Supervisory Board and Audit Committee. The Supervisory Board is deeply indebted and grateful to him for his considerable involvement and dedication over a period of 17 years. Helmut Späth succeeded him on the Supervisory Board on May 25, 2010. The Supervisory Board elected Jörg Schlagbauer to the Audit Committee as successor to Wolfgang Förster.

The Board of Management again gave regular, up-to-date, comprehensive accounts of its actions to the Supervisory Board in 2010. All decisions fundamentally important to the Company were discussed in detail between the Board of Management and the Supervisory Board. The Supervisory Board considered at length the economic situation of the Company, its business progress and business policy as well as the risk management approach and the risk situation during the past fiscal year at the four quarterly meetings and by means of regular, detailed oral and written reports from the Board of Management, and consulted the Board of Management on all these matters. The Supervisory Board reached decisions on business developments requiring urgent consideration by written circular. All Supervisory Board members were present at more than half of the meetings. The members of the Presiding Committee held extensive consultations before the joint meetings. The Negotiating Committee did not need to be convened in the 2010 fiscal year.

The principal topics at the Supervisory Board meetings were the wishes of customers for further progress towards realizing future mobility concepts. The possible solutions considered in this context included efficiency advances for combustion engines, alternative fuels, the introduction of hybrid models and the systematic development of purely electric mobility. Other major topics discussed in its

consultations included the crises in individual European countries and their impact on sales, as well as the sales strategy for the coming decade. Following detailed consultations, the Supervisory Board approved the financial, personnel and investment plans at its meeting on November 29, 2010, thereby endorsing the course of growth adopted by the Board of Management. After in-depth discussions the Supervisory Board moreover approved specific targets in respect of its composition and the content of the annual Declaration of Compliance in accordance with Section 161 of the German Stock Corporation Act (AktG).

“This success of the Audi Group is principally down to the huge commitment of all the people who work for it.”

Prof. Dr. rer. nat. Martin Winterkorn

The Audit Committee, too, met once per quarter throughout the past fiscal year; it considered the Annual and Consolidated Financial Statements for 2009, risk management, progress in the area of compliance and the increasingly rapid changes taking place in individual key markets, along with the corresponding response by the Board of Management. The Audit Committee in addition discussed the content of the 2010 Interim Financial Report with the Board of Management in the presence of the auditors prior to its publication.

The Audit Committee also advised on the independence of the auditor, the findings of additional audits commissioned and the current situation at the end of 2010.

On May 20, 2010 PricewaterhouseCoopers Aktiengesellschaft Wirtschaftsprüfungsgesellschaft was appointed by the Annual General Meeting of AUDI AG as auditor of the accounts for the 2010 fiscal year, at the proposal of the Supervisory Board. The Supervisory Board awarded the audit assignment to the auditing firm immediately after its election. The auditor of the accounts confirmed the Annual Financial Statements of AUDI AG and the Consolidated Financial Statements of the Audi Group, as well as the Management Reports for AUDI AG and the Audi Group for the 2010 fiscal year, and in each case issued its unqualified certification.

The members of the Audit Committee and Supervisory Board received the documentation for the Annual and Consolidated Financial Statements, together with the corresponding audit reports from the auditors, well in advance of the meeting on February 23, 2011. The auditor

of the accounts presented the key findings of its audit in detail at the meetings of the Audit Committee and Supervisory Board, and was subsequently available to the members of each committee to provide further information and answer queries. The auditors in addition reported on the internal control process for financial reporting purposes and on other services rendered over and above the auditing of the financial statements. According to information from the auditors, no circumstances had arisen that might give cause for concern about the auditors' partiality.

On the basis of the audit documents received and its comprehensive discussions with the auditors as well as its own conclusions, the Audit Committee recommended to the Supervisory Board at the meeting of the latter on February 23, 2011 that the Annual and Consolidated Financial Statements each be signed off. Following its own discussions the Supervisory Board accepted this recommendation and signed off the Annual Financial Statements prepared by the Board of Management as well as the Consolidated Financial Statements. The Annual Financial Statements are thus established.

There were the following changes within the Company in the past fiscal year: Effective October 1, 2010 the Supervisory Board appointed Thomas Sigi to succeed Dr. Werner Widuckel as Member of the Board of Management of AUDI AG with responsibility for Human Resources. Dr. Werner Widuckel left the Company at his own request at the end of September 30, 2010. The Supervisory Board would like to thank Dr. Widuckel for his contribution towards the running of the Company.

The Board of Management has suitably taken account of the economic environment and the challenges of the future when making its plans. It will systematically pursue the chosen path of economic growth, focusing in particular on delighting customers through the attractive product range and providing new, even more efficient mobility concepts.

The Supervisory Board will constructively continue to assist the Board of Management with implementing this growth strategy.

Ingolstadt, February 23, 2011



Prof. Dr. rer. nat. Martin Winterkorn
Chairman of the Supervisory Board



Axel Strotbek
Finance and Organization

Michael Dick
Technical Development

Rupert Stadler
Chairman of the Board of Management



Thomas Sigi
Human Resources

Peter Schwarzenbauer
Marketing and Sales

Frank Dreves
Production

Ulf Berkenhagen
Purchasing



New departures

The next chapter in mobility

The automotive industry faces the biggest challenges in its history. With an integrated concept, Audi is seeking to become the world's leading premium brand in the long term.

DEDICATION
SOCIAL VALUE
SYSTEMS

TECHNICAL KNOW-HOW
SUBSTANCE CHALLENGES
INDIVIDUALITY
SHORTER PRODUCT CYCLES

COURAGE
HYPERMOBILITY

DELIGHTING

COOPERATION
PARTNERSHIP
TECHNOLOGIES

DELIGHTING CUSTOMERS

NEW CULTURES

AUDI APPS

NEW MOBILITY CONCEPTS
INTERNATIONALIZATION





Rupert Stadler, Chairman of the Board of Management

“The people at Audi will transport their passion for the automobile into the future.”

The world is changing at a rapid pace – including its politics, the structures of the international economy and the social value systems. The worldwide financial and economic crisis further accelerated these developments. We now face a fundamental race to modernize.

I’m convinced that during this decade we will come to new agreements on

how we will live in the future and how we want to shape the society of the future. And those who are unable to establish qualitative goals in addition to profit goals will fail. Substance and sustainability are central values in this process, and their importance continues to grow. And this is due to the simple recognition that those who are not well grounded will spin out on the curve.

The people at Audi will transport their passion for the automobile into the future. With our Strategy 2020 and our e-tron studies, we are demonstrating in impressive style how much the networking, interaction and thinking are changing in our company.

We are creating something new while remaining true to our Audi mindset: Vorsprung durch Technik.

Axel Strotbek,
Finance and Organization

The automotive industry is at a turning point. On one side there is the further optimization of combustion engines, and on the other side, the technological advancement of hybrid and electric cars. This amounts to walking a tightrope, both in technical and financial terms. We will therefore invest even more heavily in new products and innovative technologies in the future. But we must remain lean enough to ensure we will not be caught out in the cold in case of major fluctuations in demand. After all, streamlined structures have always been an essential secret to the success of Audi. And this will become all the more important since planning uncertainty as a result of the volatility of the global economy, raw material prices and vehicle markets has increased significantly. Within the scope of our Strategy 2020 we therefore continue to work in a focused way on our sustainable profitability. This also means that we want to continue to finance all of our investments from the operating cash flow and use our sales and profit goals to make Audi the leading premium carmaker worldwide.



The Board of Management



Michael Dick,
Technical Development

In development, the future is the present. To be ready for the future, we find tomorrow's technical solutions today. This is more exciting than ever, as we now find ourselves on the cusp of a new automotive age. The visions of mobility are more diverse and radical than ever before. The relationship between people and the automobile is in a state of flux.

We want to be the leading premium manufacturer of e-cars by 2020. We're driven by the anticipation of being on the verge of something new and the excitement of developing completely new fields of mobility and new drive systems.

The targeted use of our resources is critical to our success. Competent experts develop the mobility concepts and cars of tomorrow in highly networked teams. The A1 e-tron with its innovative drive concept is the latest example of the creative solutions that emerge where dedication and passion meet technical know-how.



Thomas Sigi,
Human Resources



Audi has set itself ambitious goals for growth. As a consequence, we face an abundant list of challenging and exciting tasks every day. For our company, dedicated and qualified employees are the most important investment in the future.

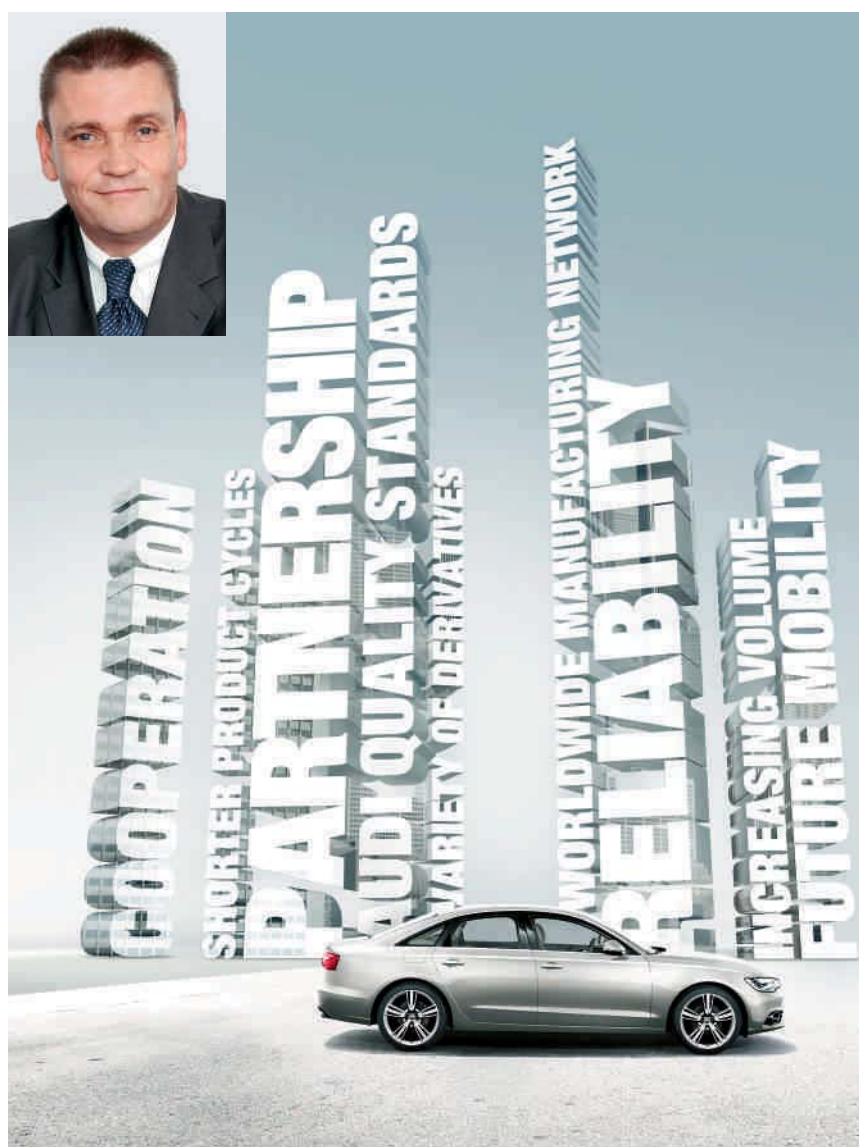
Vorsprung durch Technik is produced through innovation, and innovation comes from the minds of people. We need people who will work with us to develop answers to the challenges of the future.

Our course of growth leads us to even more intensified international-

ization. For this reason, we need people who possess the flexibility to work in foreign countries, who are open to new cultures and who represent the Audi brand with enthusiasm. This is why we are continuing to work on our strategy to become the most attractive employer.

Ulf Berkenhagen,
Purchasing

Audi is working hard on the mobility of the future, with the electrification of the driveline playing a key role in this context. Until this goal is achieved, however, development work will be influenced for some time to come by the coexistence of various technologies and energy sources. These diverse concepts represent a major challenge for Purchasing at AUDI AG. Additional suppliers will provide us with new types of parts and modules which will have to satisfy the highest Audi quality standards. At the same time we have to keep our eye on the costs. And we will devote ourselves even more intensively to the global challenge in the future. That means that we will supply a worldwide manufacturing network with material. This goes hand in hand with shorter product cycles, a variety of derivatives and an increasing volume. At the same time we expect our suppliers and service providers to work reliably and in partnership with us, and for them to be open to new developments as well.



The Board of Management

Frank Dreves, Production

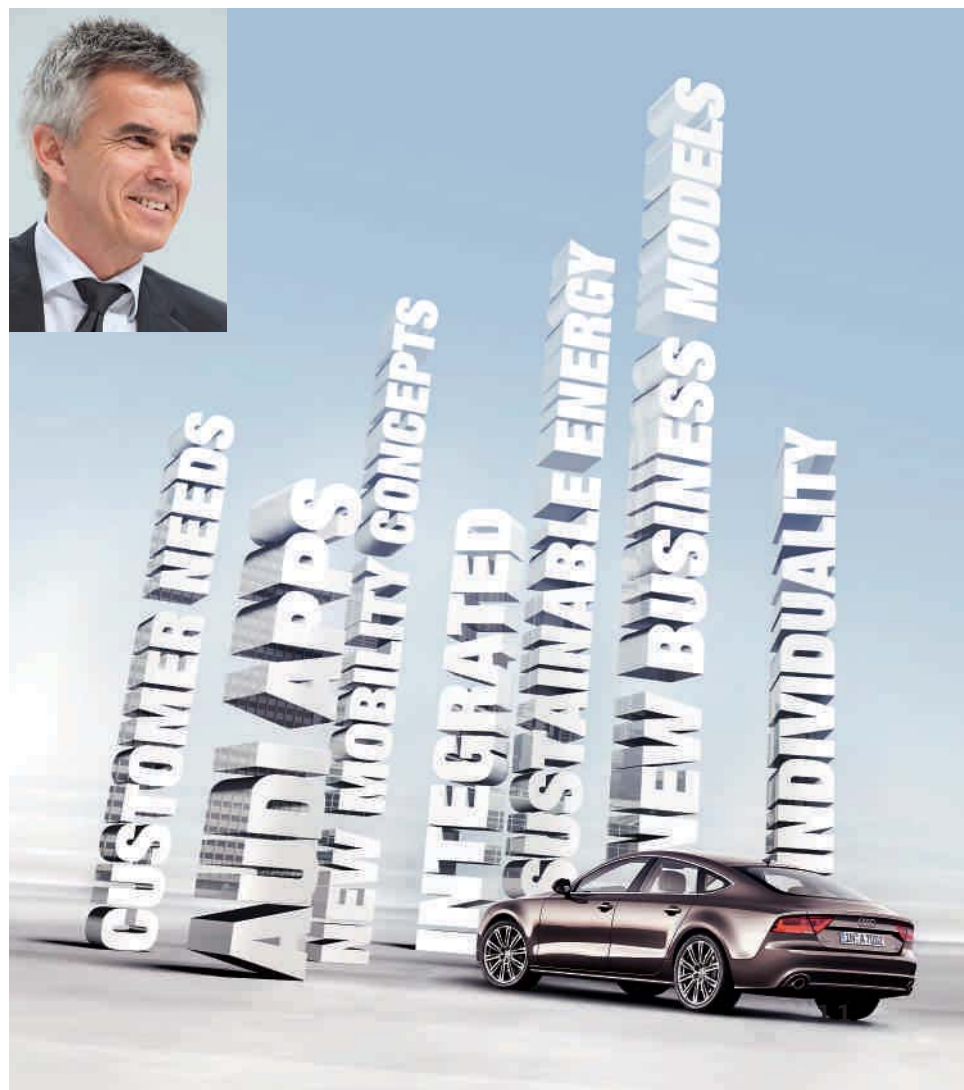
We are facing the biggest technological upheaval in the automotive industry. We have to imagine today where we want to be tomorrow, and then consider how we will get there. For this, we need to have the courage to forge new paths, to leave the well-worn ones behind and to throw out old conventions.

Our vision is called "Premium Production." We contribute significantly to delighting the customer – with top quality, 100 percent delivery reliability and local production. Production stopped being the only core responsibility of Audi Production a long time ago. With our know-how, we make new technologies possible in the first place.

Victor Hugo once said, "The future has many names. For the weak, it means the unattainable. For the fearful, it means the unknown. But for the courageous, it means opportunity!" We will join together to seize this opportunity.

Peter Schwarzenbauer, Marketing and Sales

Shareholders' meetings often leave behind a hollow feeling that a company exists as an end in itself. But employees at Audi experience a different kind of company. Its purpose is to fulfill customers' needs; its ambitious goal is to do this better, more comprehensively and in a more visionary way than the others. Our answer for the future is that we will be much more open. For our customers, whose creative ideas we want to integrate into our products starting as early as the development process. And who can configure their Audi exactly as they wish with downloadable apps. For new business models, because we believe that new mobility concepts only make sense if they are integrated – and we want to deliver the sustainable energy along with our Audi models of the future. For new partners, because together, we will achieve much more. For our community, since the work of each individual at Audi is work for others – on products and services that make our lives that little bit better.



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The multimedia Audi 2010 Annual Report

Online highlights

As an app, a mobile site or a website on the Internet on which you can even scroll by hand: The multimedia Audi 2010 Annual Report is an experience. Just click in to find out.

The website

Videos, slideshows, audios – at www.audi.com/ar2010, the Annual Report becomes a multimedia experience for your senses. See the e-tron in action and find out about the future of mobility. Watch an Audi designer at work and experience a racing legend testing an electric sports car.

Take a look at interviews and spectacular photo productions.

It's all possible with the multimedia Audi Annual Report.



The mobile site

The Audi 2010 Annual Report to go: On the mobile portal you will find selected texts, audio files and videos from the multimedia 2010 Annual Report. All contents are designed for you to read, watch and listen to on your smartphone.



Listen

The Audi 2010 Annual Report as an audio book: All articles can also be downloaded as an audio file from the website and in the Apple iTunes Store.



Watch

Pictures come to life online: Enjoy the Annual Report as an audio-visual experience.

Lifestyle



Energy



Efficiency



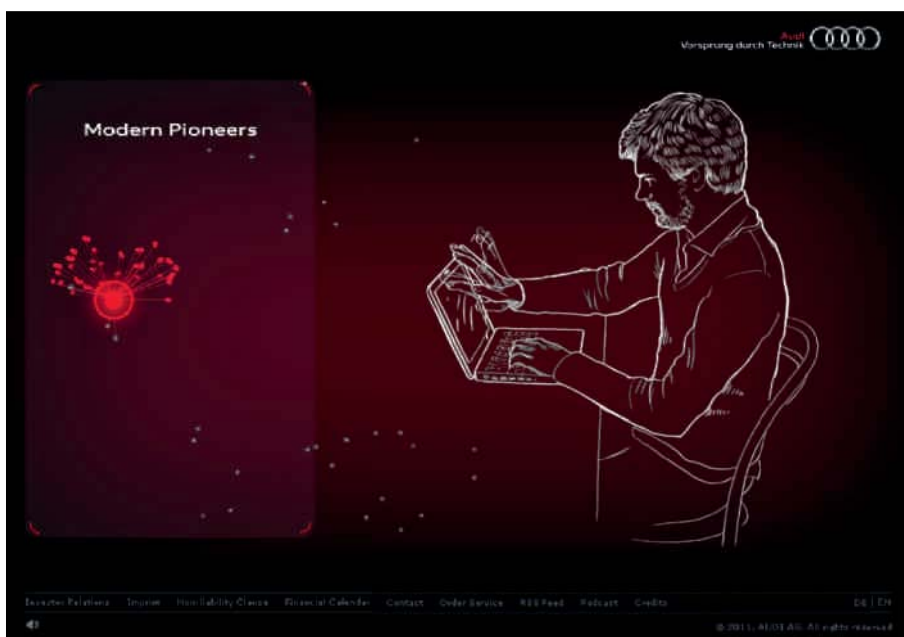
The Audi Board



Best times



Mobility



You can navigate through the innovative website entirely without mouse, keyboard or touchscreen – thanks to your webcam. Move your hand in front of the camera and scroll through the virtual world of Audi. It may sound like magic, but it's actually a whole lot of fun.

The apps

Download the Annual Report as an app to your iPhone or iPad, and enjoy the contents as a multimedia experience. With just a swipe of the finger you can navigate from the article on Tim Berners-Lee, for example, to the video on the first Audi full hybrid. It couldn't be easier. Exclusively in the Apple App Store.



PHOTOS | NOKIA; OLAF TAMM; APPLE ILLUSTRATION | ANJE JÄGER



Audi apps

As well as the Audi Annual Report, you will find the Audi Magazine and many other interesting apps relating to the Audi brand in the Apple App Store.

Audi the pioneer



Electric mobility

A vision becomes reality

Setting off for the future: True to its motto “Vorsprung durch Technik,” Audi also wants to become the leading premium manufacturer of electric vehicles.

Open-top sports car with
plug-in hybrid drive –
the Audi e-tron Spyder.

**“Just as the name quattro has
become synonymous with
all-wheel drive, e-tron will become
the Audi brand name for electric mobility.”**

Rupert Stadler, Chairman of the Board of Management of AUDI AG



The various studies demonstrate the comprehensive approach that Audi is pursuing with electric mobility.

The future has a name at Audi. The designation “e-tron” is reserved for electric cars in the future. “Just as the name quattro has become synonymous with all-wheel drive, e-tron will become the Audi brand name for electric mobility,” says Rupert Stadler, Chairman of the Board of Management of AUDI AG.

Electric cars are expected to no longer be a niche product, but rather a natural part of the product range in not more than ten to 15 years. “There is no getting around electric

mobility,” says Franciscus van Meel, Head of Electric Mobility Strategy at Audi.

This represents no more and no less than a fundamental system change. “Electrification of the powertrain is not simply another engine variant,” explains van Meel. “We have to reinvent the automobile and reposition ourselves as a manufacturer.”

Audi is facing up to the responsibility. It is a matter of answers to global climate change, of alternatives to the fossil raw material petroleum

and of modern mobility concepts for the fast-growing megacities of this world.

Audi is convinced that the future of mobility will be characterized for many years by the coexistence of different technologies and energy sources. Developers want to offer the best solution for each market and for each customer.

The Audi e-tron studies presented to date demonstrate the breadth of the new technologies:

► **Audi e-tron** – the supercar was a highlight of the 2009 International



e-tron Spyder:
an exciting
symbiosis of clearly
structured, modeled
surfaces and
precisely defined
structures.

World premiere: The e-tron Spyder study
at its presentation at the Paris Motor Show
in October 2010.



Motor Show (IAA) in Frankfurt am Main, Germany. Four motors – two each on the front and rear axles – producing a total of 230 kW (313 hp) ensure phenomenal performance and make the sports car a true quattro.

► **Detroit showcar Audi e-tron** – the compact two-seater with an aluminum body was presented in early 2010. Distinguishing features: purist design, low gross weight of 1,350 kilograms, two electric motors on the rear axle with a total output of 150 kW (204 hp); range is as much as 250 kilometers.

► **e-tron Silvertta** – in July 2010, Michael Dick, Member of the Audi Board of Management for Technical Development, and factory driver Lucas Luhr piloted the technology platform based on the Audi e-tron to a first-place finish in the first “Silvertta E-Auto Rally Montafon.” The rally against more than 20 electric cars from other manufacturers covered 167.5 kilometers. As Michael Dick explained, the victory was “the proof that we are well on our way to a production-ready electric powertrain.”

► **A1 e-tron** – the innovative Mega City Vehicle (MCV) celebrated its premiere at the 2010 Geneva Motor Show. The A1 e-tron has an electric drive with a peak output of 75 kW (102 hp), with which it drives with zero local emissions. The battery can be recharged while underway using the range extender, a compact unit comprising a single-rotor engine and a generator.

► **e-tron Spyder** – in fall 2010, Audi presented the study of an open-top sports car with plug-in hybrid drive at the Paris Motor Show. Just 1.11 meters

tall, the exciting two-seater has a 221 kW (300 hp) twin-turbo V6 TDI engine on the rear axle and two electric motors with a combined 64 kW (87 hp) on the front axle. The e-tron Spyder can combine the strong 650 Nm of torque from its TDI engine and the total of 352 Nm of its two electric motors during acceleration in a process known as “boosting.”

Audi is completely rethinking the electric car with the e-tron.

Even in the Electric Age, customer requirements will develop differently. Besides the requirements of the markets, the intended purpose of the electric vehicles also plays a major role. An all-electric car will establish itself in the short-range mobility segment in the medium term. Long trips, on the other hand, are forecast to be the domain of hybrid drives.

There are still many customer suitability challenges remaining to be solved with respect to costs, range and battery recharging time, as well as the real potential for CO₂ reduction. The entire energy balance must be considered whenever talking about sustainable mobility, and this is largely a function of how the necessary electricity is generated. Conventional electricity has a CO₂ load of around 120 grams per kilometer. This corresponds to the value for a modern mid-size car featuring a combustion engine. If the electricity, on the other hand, is generated using

renewable sources, this is reduced to just five grams with electric motors.

“Audi electric cars will run on sustainably generated electricity,” emphasizes Audi Chairman Rupert Stadler. “We are promoting the construction of solar and wind energy units in order to achieve this goal.” In 2010, for example, Audi entered into a partnership with the industry initiative Dii GmbH, whose long-term objective is to realize the DESERTEC vision. This vision describes the prospects of supplying Europe, the Middle East and North Africa with solar and wind energy from the deserts.

Design, driving dynamics, efficiency and lightweight construction will continue to be decisive factors in the future.

As a premium manufacturer, Audi must continue to further develop its core competences in the interest of electric mobility. Design, driving dynamics, efficiency and lightweight construction will continue to be decisive factors in the future. Dietrich Engelhart, who is Head of Vehicle Electrification Strategy at Audi, feels that customer delight will continue to be key to success in the future. “Customers expect performance and emotions from Audi, and we must continue to meet this expectation in the future.”

The Audi e-tron is sure to generate enthusiasm. Audi wants to bring a

limited edition of the vehicle to the roads in late 2012. The first Audi high-performance sports car with all-electric drive proves that driving in the Electric Age will not have anything to do with sacrifice, but instead will open up new dimensions of driving dynamics.

The study's four asynchronous motors – two each on the front and rear axles – transfer the power to the wheels via a single-speed transmission and short drive shafts. With peak output of 230 kW (313 hp) and with up to 600 Nm of torque available from a standstill, the Audi e-tron delivers breathtaking performance. It catapults from 0 to 100 kilometers an hour in just 4.8 seconds.

The liquid-cooled lithium-ion battery and the power electronics lie directly behind the passenger compartment. The result is an excellent center of gravity and a load distribution of 42:58 between the front and rear axles – similar to the production R8.

The first short test drive with the e-tron Silvertta shows the potential of the electric powertrain. The high-performance sports car shoots forward as if it were being pulled by an elastic band, with turbo-like, nearly silent acceleration. An impressive driving experience, as Stefan Keller, Head of Electrification Processes, can confirm. “The response is uniformly positive at every driving event. Everyone is enthusiastic.” According to Keller, what now needs

e-tron: the evolution of mobility

The original model of the e-tron family will be launched on the market as a small production series in 2012 (below).

Audi e-tron

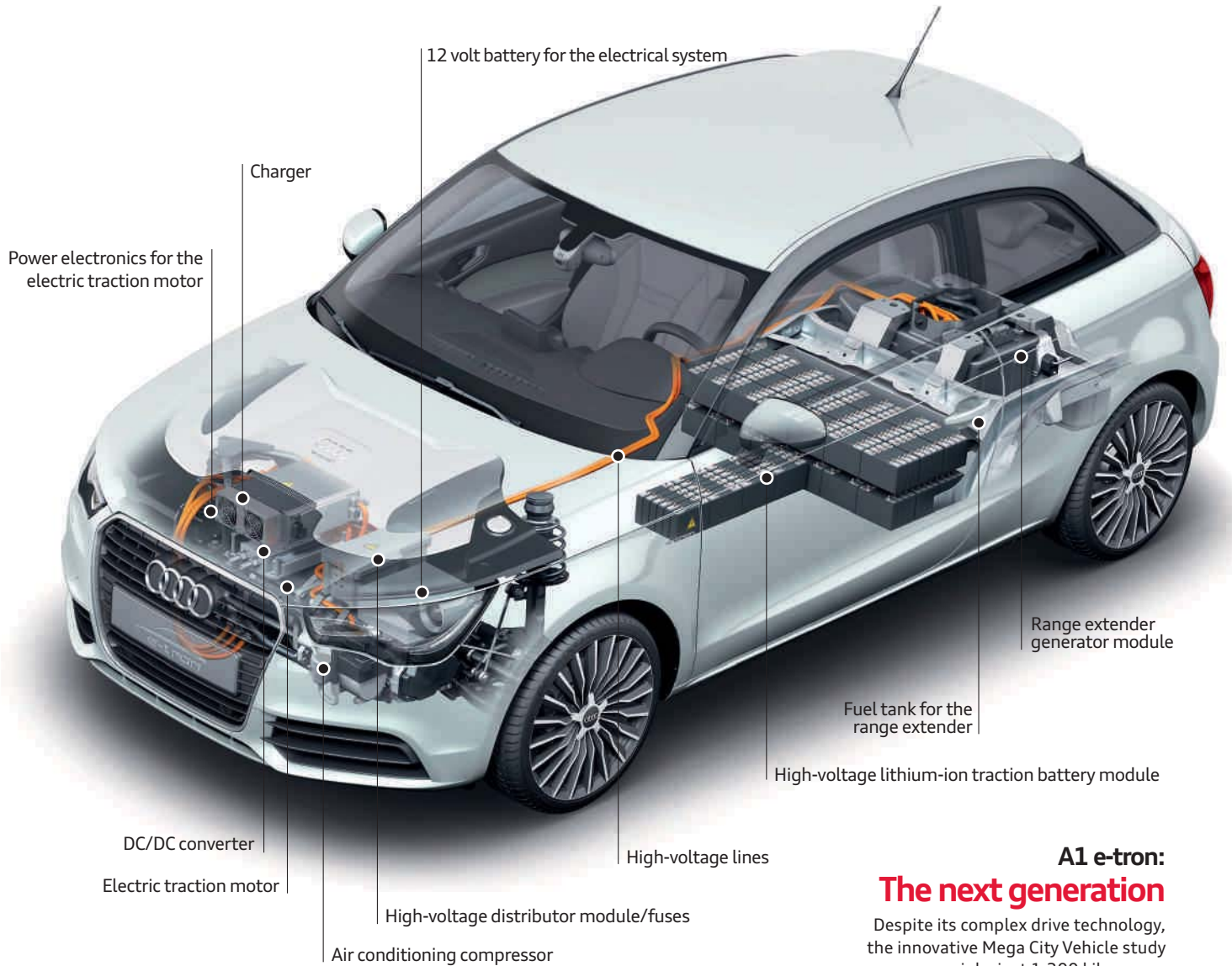


Detroit showcar Audi e-tron



e-tron Silvertta

The Detroit showcar is a compact sports car with two electric motors on the rear axle producing a combined 150 kW (204 hp) (left). The e-tron Silvertta proved its maturity at the first Silvertta E-Auto Rally Montafon.



A1 e-tron: The next generation

Despite its complex drive technology, the innovative Mega City Vehicle study weighs just 1,200 kilograms.

to be done is to “build on the Audi core competences” on this basis.

quattro permanent all-wheel drive has been a part of this for over 30 years. Electric cars offer entirely new possibilities in this field. The four electric motors fitted

on the Audi e-tron can be individually controlled – a type of quattro drive for electric cars. The four motors allow what is known as torque vectoring, the selective acceleration of individual wheels and therefore active distribution of torque.

“The Audi e-tron,” says Dr. Michael Korte, Head of Predevelopment of Vehicle Concepts at Audi, “is superior to the majority of conventional cars at the limit.”

Systematic lightweight construction is also a crucial prerequisite for the

A1 e-tron



The A1 e-tron is an innovative Mega City Vehicle (MCV) with electric drive and a single-rotor engine with generator. The study's total range is up to 250 kilometers.

e-tron Spyder



The study of an open-top sports car demonstrates the potential of the plug-in hybrid drive. A twin-turbo V6 TDI produces 221 kW (300 hp); the two electric motors together deliver an additional 64 kW (87 hp) of power.

efficiency and range of electric cars, for the batteries with their relatively high weight are still a heavy burden. The Audi engineers therefore turned to another of the company's core competences for the Audi e-tron: The body is made of aluminum. With its Audi Space Frame (ASF) technology, it is an important reason why the Audi e-tron tips the scales at just 1,600 kg.

The Audi e-tron provides a glimpse into Audi's corporate philosophy of electric mobility. Extending far beyond the battery technology and the replacement of an internal combustion engine by an electric driveline, the concept is holistic. The complex interplay of all components influences the key factors of efficiency, range and practicality.

The A1 e-tron, which is designed as a Mega City Vehicle (MCV) for metropolitan areas, also demonstrates this comprehensive approach. The compact two-door car is one of the world's first all-around vehicles powered purely by electricity to have four seats and a full-sized trunk. Its electric motor produces peak power of

75 kW (102 hp), with 45 kW (61 hp) available in continuous operation.

The Audi A1 e-tron embodies an intelligent technological concept. A lithium-ion battery pack provides the energy for the electric drive. The driver generally charges the battery pack from the grid – most conveniently, from a home socket. A full battery charge is enough for a range of over 50 kilometers. "That is more than sufficient for the daily commute to work," finds Dietrich Engelhart.

In case the driver wants to cover a longer distance, the A1 is equipped with a small rotary engine that recharges the battery if necessary for a range of roughly 250 kilometers.

At first glance, the compact two-door car is nearly indistinguishable from its "normal" sister models. The interior has been completely redesigned, however. All of the A1 e-tron's auxiliary systems, such as the air conditioning, the power steering and the pump for the brake servo, are electric-powered.

The compact two-door car otherwise affords all the strengths of the Audi A1

model series – a small turning radius, good sightlines and high agility.

Going with the trend of the future doesn't entail the slightest sacrifice for the A1 e-tron, especially since the interior space and the luggage compartment capacity match those of series production models.

The A1 e-tron is already a big little car. The structure of its Multi Media Interface (MMI) matches that of the A8 flagship. Audi is going new ways there, as well, under the motto of electric mobility planning. Because electric powered cars still cannot match the range of combustion engines, Audi is working on information concepts that will offer the driver optimal planning capability.

The imagination knows virtually no limits when it comes to the future interaction between driver and vehicle. Examples include individual computation of range for each driver, computation of fuel consumption for different classes of roads, checking the battery charge status from outside the vehicle using a smartphone, for instance. The connection of the car to

Fleet test

Electric mobility in practice

In order to investigate electric driving in practice more closely, Audi will be joining three project partners – the energy supplier E.ON, the Munich public utility company SWM and the Technical University of Munich (TU München) – in launching a fleet test with the A1 e-tron. The first vehicles should be hitting the road in Munich in 2011.

E.ON and SWM are installing the necessary infrastructure, E.ON primarily in the outlying areas and SWM in the Bavarian state capital. A total of 200 charging stations are to be made available. TU München will analyze mobility behavior during the term of the project. Audi also hopes to learn more about the behavior, but also the expectations of our customers

regarding their dealings with electric cars from this fleet test. How intensively and in which situations is the electric car being used? What other modes of transportation are being used in normal practice? Given the increasing urbanization worldwide, there is another question to be addressed: What does a mobility concept of the future look like?



"The results of the project will help us to further expand our expertise in electrification."

Rupert Stadler, Chairman of the Board of Management of AUDI AG.

the grid also opens the door to new comfort and safety features, such as bringing the cabin to a preset temperature before setting off.

More than 400 specialists are currently working in the field of electric mobility at Audi.

At Audi, the future has already begun. At present over 400 specialists at the company's Technical Development division are working in the field of electric mobility with the support of several hundred colleagues from the widest variety of fields.

At the same time, a strategic bundling of activities is taking place. To this end, Audi has established the e-performance project house for electric driving. In addition, a team of Audi development engineers and scientists from a variety of universities, research institutions and startup companies have been working since fall 2009 on the development of a new total concept, from the body to the battery to the power electronics. This is part of the e-performance research project sponsored by the German Federal Ministry of Education and Research.

A number of substantial challenges still remain to be solved, in particular with regard to battery technology. Since the introduction of lithium-ion batteries for vehicle applications, "development has made huge strides in power density," says Dietrich Engelhart. But a range of 250 kilometers still means 10 hours of charging time on the residential power grid. By contrast, filling up at the fuel pump takes just a few minutes.

So there is still a lot to do. Given diminishing resources and the debate about climate change, the development is unstoppable and there also seems to be no turning back. "We don't know today how long the petroleum reserves will last," says Stefan Keller, "but we do know one thing: They are finite." ●

THOMAS AMMANN



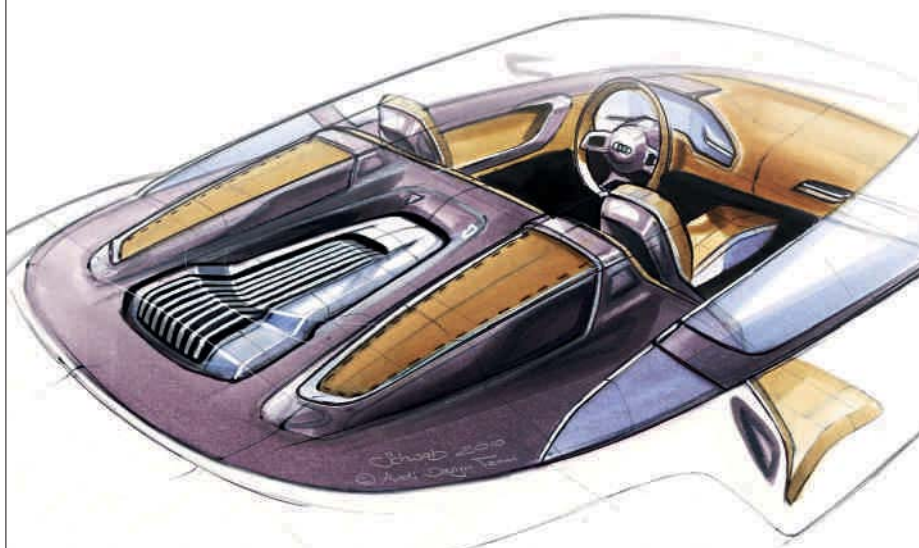
Design study

A sketch of the Audi e-tron Spyder: The open-top two-seater features the most advanced and simultaneously the most consistent evolution of the current Audi design language, and provides initial hints at the design of future Audi sports cars.



Silvretta cockpit

The display with integrated functions of the Multi Media Interface (MMI) indicates the battery charge status. The round power meter to the left shows the overall output of the system and the respective operating states.



Interior

Visual and functional references to the fundamental concept of lightweight construction characterize the design of the Audi e-tron Spyder – flowing transitions between exterior and interior which produce a formal unit.



Find out more about the next chapter in mobility at:
www.audi.com/ar2010/e-tron

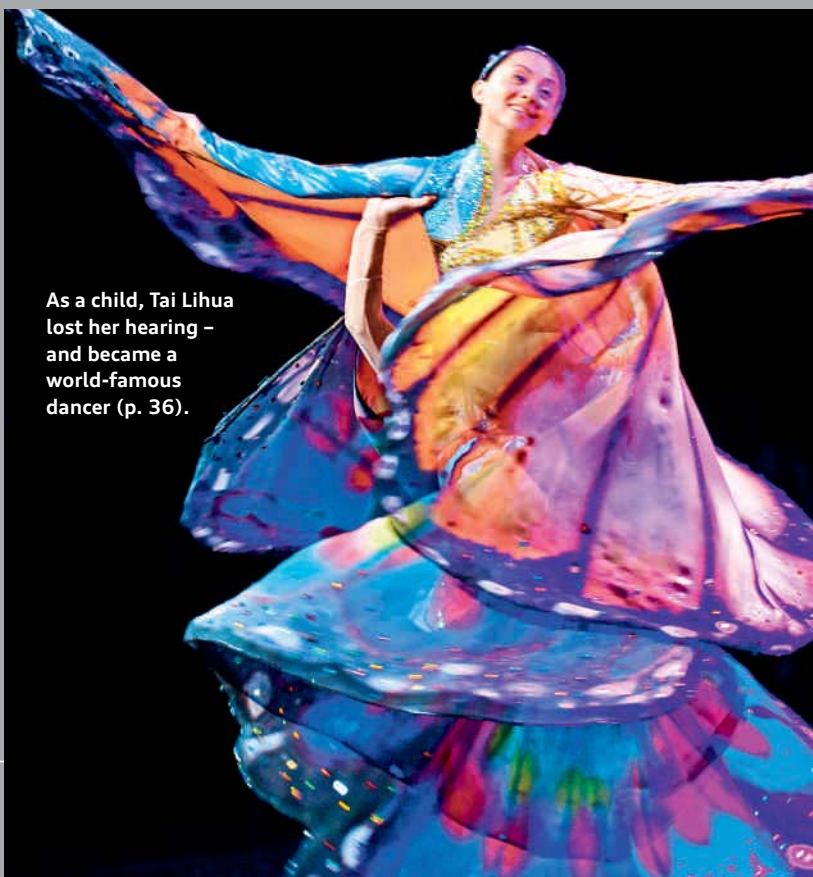


Modern pioneers discover the world

They are visionaries in their fields: Explorers, artists and engineers keep on going beyond the limits of our imagination. These modern pioneers not only break records but also open our eyes to new horizons.



Johan Ernst Nilson wants to travel from the North to the South Pole – under his own power and with Audi's technical support (p. 26).



As a child, Tai Lihua lost her hearing – and became a world-famous dancer (p. 36).

- 26 **The last great adventure**
Johan Ernst Nilson, adventurer and explorer, wants to travel from Pole to Pole.
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Tai Lihua dances to music – a music she will never hear.
- 40 **The Web – for everyone, anytime, anywhere**
Tim Berners-Lee and the networking of information.
- 42 **The first SUV was driven on the moon**
NASA astronaut David Randolph Scott and his greatest adventure.
- 46 **Remeasuring the world**
TerraSAR-X and TanDEM-X are remeasuring the Earth's land surface.



Johan Ernst Nilson climbing
Mount Everest – the highest
mountain in the world.

From Pole to Pole

The last great adventure

The Swede Johan Ernst Nilson wants to travel from the North Pole to the South Pole in 2011. The Audi brand will be assisting him by providing ultramodern technology, materials and logistics.



Modern pioneers

Johan Ernst Nilson, 40,
adventurer and explorer.



Minus 20, minus 30 – how cold is it?” asks Johan Ernst Nilson and pulls his hat off. His blond hair falls down over his sun-browned forehead. “Very nice here,” he says, walking through the cold chamber in the Audi Wind Tunnel Center in Ingolstadt. A thin sheet of ice has already formed on its steel walls, and the Swede has already been enjoying the deep freeze for half an hour. Normally, it is car models that are tested here for their winter resistance properties. Instead, a tent has been put up in the middle of the chamber. Nilson brushes ice from the tent and rubs it into the bristle on his chin. Freezing? Certainly not! The fact that in a few weeks’ time it will be a whole lot colder – round the clock and for weeks on end – evidently warms the heart of the man from Stockholm.

Johan Ernst Nilson, 40, is by profession an adventurer and explorer. One morning finds him speaking to businessmen in Gothenburg about his polar expeditions, and the same evening he is heading for Tanzania to guide a group of managers to the top of Kilimanjaro. Just another regular working day in Nilson’s life.

Over the last 17 years Nilson has been on expeditions to more than 100 different countries. He has climbed Everest and some of the world’s other highest peaks, has crossed the Atlantic on a

jet ski and traveled by flying boat from his home town of Stockholm to Africa. But that’s another story.

On this particular winter’s day, Nilson is visiting the Audi plant to use the cold chamber to help prepare for what is probably his biggest expedition yet. A trip that will take a year. He wants to travel from one extreme to another – from the North Pole to the South Pole.

Nilson is heading from Pole to Pole. On foot. On skis. By bicycle. Pulled by a kite.

On foot, on skis, by bicycle, pulled by a kite and with a sailing ship. He will be accompanied on terra firma by an Audi support vehicle. The car will contain the camera team and journalists covering his odyssey.

It is not easy nowadays for an adventurer to tread virgin territory. After all, there are hardly any adventures left that no-one has ever experienced. All mountains have been climbed, all deserts crossed, all climatic extremes explored. What makes Nilson’s missions unique is the combination of challenges he tackles. For example, he did not simply climb to the top of one of the 8,000-meter-plus peaks, he opted to scale the heights of the highest mountain on each continent, and called the undertaking his “Seven Summits Tour.”

And now the route is from Pole to

Pole. Probably one of the last great adventures still possible on Earth today. Nilson calls this trek of almost 30,000 kilometers his “Pole2Pole” expedition. Should he in fact reach the South Pole in the spring of 2012 he would be following in the footsteps of the great explorers.

And exactly that pioneering spirit is what he and Audi have in common. The carmaker has always blazed new trails: systematic lightweight design, quattro permanent all-wheel drive, the TDI diesel engine, or – most recently – all-electric cars. Audi is supporting Johan Ernst Nilson on his expedition: with ultramodern technology, materials, logistics – and with the cold chamber in Ingolstadt. It is here that he tests all his equipment, including his tent, sleeping bag and clothing. This might sound like a camping holiday, but out in the eternal ice these items are the difference between life and death. “Some tents simply collapse when the mercury drops to -40°C,” Nilson reports. The session in the cold chamber helps him decide which tent he should take with him from Pole to Pole. “A day here offers me as many insights as a trip to the Arctic,” he declares.

It is there, or to be precise at the geographic North Pole, that Nilson’s adventure will start: on April 6, 2011. He chose the date carefully, as it is the anniversary of what is said to be

Nilson tested his equipment in the Audi Wind Tunnel Center (right). These preparations could be the difference between life and death. Nowhere else in the world is it as stormy as in the Antarctic, with winds gusting at up to 300 km/h.



the first successful expedition to the North Pole – by Robert Edwin Peary in 1909. And 2011 is also the anniversary of the first successful journey to the South Pole, which Norwegian Roald Amundsen reached following a spectacular race against another team on December 14, 1911 (see p. 35).

“I will be following in the footsteps of those great explorers in history,” comments Nilson, “with the difference that I will be far better equipped.” The adventurer will be relying on a perfectly calibrated sled that he will pull along behind him. This sled, which features an Audi design, has been customized to meet the extreme conditions at the North Pole. It must be exceptionally light, waterproof and sturdy – and be able to carry loads of up to 120 kilograms without breaking.

Nilson plans to cycle from Canada to Patagonia in six months. 100 kilometers a day.

The tent, sleeping bag, substitute clothing, cameras, navigation system, food and tools need to be kept dry. In the Arctic, the temperature in April is around -40°C. In places, the pack ice is several meters high, and elsewhere only a few centimeters thick. It is not unknown for those making the trip to the North Pole to have the ice break beneath them. Nilson will be accompanied on this stage of the expedition by an adventurer friend of his, who will rescue him from the water should such a situation arise.

After arriving in Greenland, Nilson will sail to Ottawa in Canada. There, he will switch to a bike and pedal the length of North, Central and South America, which he plans will take him six months, at “100 kilometers a day.” Right through to Patagonia, from where the Swede will set sail for the Antarctic; here he will be greeted by temperatures of as low as -60°C. Johan Ernst Nilson is aware that “the South Pole leg will be the most critical point in the expedition.” The long trek may all come to nothing in the eternal ice – owing to dangerous storms, broken equipment, or simply because after almost one year of constant effort Nilson may be absolutely exhausted and unable to go on.

The Antarctic ice is as coarse as rough sandpaper. Nilson wants to exploit this hard ground and use a kite to pull him along on skis for large sections of the journey – like a kite surfer on the ocean.

If you thought there was too much snow last winter you will be asking yourself: Why choose to embark on such an undertaking? What drives a man to suffer for 365 days simply to get from the top to the bottom of the world? One could fly it in a day, and it would cost only a fraction of Nilson’s expedition expenses.

“I wanted to see and experience things that no one had before me.”

“I am not addicted to adrenalin,” he responds, “but I love waking up in the morning and not knowing what the day will bring.” As a child he was shy and withdrawn, he says, and got poor grades in sport. Nilson preferred to write poems and play the piano. “I never actually wanted to learn what I could read in books anyway,” he explains. “I wanted to see and experience things that no one had before me.”

He has been busy with preparations for his Pole2Pole expedition for almost two and a half years now. None of it has been simple. How to protect a high-resolution camera against continuous sub-zero temperatures? How to shoot a film if you can hardly move your fingers? Questions to which Nilson had to find answers.

Audi engineers helped him in the search for solutions. With Audi’s support, sled experts from Acapulka developed a super-fast special-purpose sled for the journey to the South Pole. “It will be made of carbon and thus extremely light,” explains Audi engineer Dr. Karl Durst. But just being light is not enough in the eternal ice. “The functionality is what counts. In the Antarctic the sled will be pulled across crevasses and will need to withstand falls of several meters.”

Unlike in the Arctic, in the Antarctic there is virtually no humidity in the air.



Nilson on skis, with a kite-sail and a special sled – this is the way the Swede intends to reach the South Pole.

“I will be following in the footsteps of those great explorers from a century ago. With the difference that I will be far better equipped.” Johan Ernst Nilson



The clear forms and dynamic lines of Audi design can also be seen in the initial concepts for the expedition sled.

Audi designers and lightweight design experts consult with sled builder Alexander Bierwald from Acapulka (second from right).



In 2007, Nilson set out on the first zero-carbon ascent of Everest. The photo was taken when he reached 8,000 meters.



The surface of the ice is thus as coarse as rough sandpaper. Nilson wants to exploit this hard ground and use a kite to pull him along on skis for large sections of the journey. “The friction factor of the skis and the sled runners will be crucial,” Nilson explains in the cold chamber, “and I’m looking forward to using the fastest sled ever made. That’s what I call Vorsprung durch Technik.”

Nilson knows what he’s talking about. During his first tour, back in 1994 when he was 23, he paid virtually no attention to his equipment. The idea came to him over a beer or three with friends one evening in a café in Stockholm while they were discussing their plans

for the summer. “Actually, we always went to Marbella,” Nilson recalls. But this had grown boring for him. “Why don’t we go to Morocco?” he suggested, but the others just shook their heads. Nilson decided to go it alone to Africa. “You’re going to fly down there on your own?” his friends asked. “No,” answered Nilson, “I’m going by bike.” His friends laughed at the plan, but this only fired Nilson’s ambition. They made a bet: The loser would buy dinner. The very next day, Nilson bought a bike, a tent and a map – and off he went. 52 days later he rang his friends up – from Africa.

The trip was to change Nilson. The man who had studied journalism and



film longed for the next journey. He repeated the Stockholm-to-Africa trip, this time by kayak – and once again years later in a flying boat that he built himself, essentially from an inflatable boat, a kite and a propeller. Once, when he was at a height of 3,000 meters, interceptors were sent up to meet him. The officers could simply not explain the image on their screens. Never had they witnessed such a small aircraft – and such a slow one – at such a height.

Expeditions in the Himalayas and to the North Pole followed. Nilson rode across Mongolia on horseback and crossed the Atlantic by jet ski, teaching himself the skills as he went.



Wolfgang Egger, Head of Design for the Audi Group, in the Audi Design studio in Munich.

Interview

“We always first think of the material and of how to use it in an authentic manner”

Wolfgang Egger’s product design team is developing a carbon sled for Johan Ernst Nilson’s expedition, working jointly with the specialists at Acapulka.

For a carmaker, what is the great appeal about building a lightweight sled?

We want to position Audi Design as an exclusive design brand. To this end, we also create extraordinary products away from the world of cars. And it is a particular challenge to use a high-tech material to develop a sled that will be a reliable companion for explorer Johan Ernst Nilson on his expedition to the South Pole.

Are there parallels between the design of a car and that of such an extraordinary piece of sports equipment?

In this case, the designer faces a very similar task: He has to implement a functional form that is to fulfill specific technical requirements in an emotional design.

The sled is made of carbon. What role does this material play in such a development process?

The material is of immense importance for the design. Its properties and history form the basis for our work. We always first think of the material and of how to use it in an authentic manner. This results in a unity of function and emotion.

Is there any common ground between your work as Audi designers and that of Johan Ernst Nilson as an explorer?

Johan Ernst Nilson’s marvelous pioneering achievements and mindset, with his wish to overcome the power of nature by means of his own strength, are a perfect match for Audi. With our brand essence of *Vorsprung durch Technik* we designers aspire constantly to create innovations and thus to be a step ahead of the times. We therefore see ourselves as pioneers, just like Johan Ernst Nilson.



Johan Ernst Nilson tested his equipment in the cold chamber at the Audi Wind Tunnel Center in Ingolstadt at -30°C – and then fielded questions from a TV crew.



“I just get up and go,” he says, and it sounds like his motto in life. His partly bizarre and partly spectacular expeditions brought him fame in Scandinavia. He is an ambassador for a charity run by the Swedish queen, and when in 2007 he completed the world’s first zero-carbon ascent of Mount Everest he was inducted into the renowned New York Explorers Club.

“I want to live my dream,” Nilson says. And that’s not all. During his past polar expeditions and trips to the world’s summits he has seen many a melting glacier. “I feel it is my responsibility to help halt global warming,” he states, “as otherwise one day there will be no more glaciers for me to climb.”

This message will be accompanying stubble-faced Nilson on his Pole2Pole tour. While in the United States, he intends to tell the story of his travels to journalists and at Audi dealerships, in order to enhance the growing ecological awareness in the world. Audi is assisting Nilson by providing a car that will accompany him from Canada to Tierra del Fuego. “Audi is not my sponsor, but a partner,” Nilson professes, “we’re a team.” Customers and staff will also benefit from this. You can visit www.audi.com/ar2010/pole2pole to watch a video in which Nilson regularly reports on what he has seen and done.

There’s still quite a while to go until April 6, the day when Nilson will begin his expedition at the North Pole. And he needs this time. “To prepare myself I go through every stage of the trip in my head, day-in, day-out, non-stop,” he says before leaving the cold chamber and brushing the ice off his gloves. He is thinking over what he still needs and what he might have forgotten. “And then I visualize those last few meters,” he says with a grin. The last few meters en route to the white rod that marks the South Pole. Nilson’s goal. ●

STEPHAN SEILER



Follow Nilson round the world

Accompany explorer Johan Ernst Nilson on his journey from Pole to Pole. His video blog and all the details on the expedition can be found at: www.audi.com/ar2010/pole2pole



Race to the South Pole

It is exactly 100 years ago that the first person reached the South Pole and thus one of the world's last uncharted points.

It was a historic race: 100 years ago Briton Robert Falcon Scott (1868 – 1912) and Norwegian Roald Amundsen (1872 – 1928) competed to be the first to reach the South Pole. They traveled along different routes. Amundsen chose an unknown path from the coast to the South Pole, which was around 120 kilometers shorter than the route taken by Scott. At each degree of latitude Amundsen set up depots with food and fuel. Thanks to his sled-dogs, the Norwegian often covered more than 50 kilometers a day, whereas Scott made slower progress with his ponies and motor sleds. The sleds gave up the ghost after only 90 kilometers and the ponies collapsed from exhaustion at the beginning of the climb up to the polar plateau, leaving Scott and his team to pull their own sleds – with more than three quarters of the journey ahead of them.

After 56 days, on December 14, 1911, Roald Amundsen finally reached the South Pole. It was -30°C and an

icy wind was blowing. One of his men noted: "The great thing is we are the first!"

Scott did not reach the South Pole until January 17, 1912. Only to find the Norwegian flag flying there. He jotted in his diary: "A terrible disappointment. All the effort, all the sacrifice, all the torment, for what?" Scott and his men did not have enough food or fuel with them, were suffering from scurvy and frostbite. The 1,500-kilometer return leg was just too much, and 20 kilometers from the camp with stores that would have saved them Scott gave up – at -40° C and in the midst of severe snow storms. His last diary entry is dated March 29, 1912. His body and those of his companions were found eight months later.

Three years earlier, on April 6, 1909, American explorers Robert Edwin Peary and Matthew Henson had reached the North Pole. However, the scientific documentation on their achievement is inconclusive.



(1) American Robert Edwin Peary (1856 – 1920) claims to have reached the North Pole at his third attempt, on April 6, 1909. (2) British Naval officer Robert Falcon Scott paid for his thirst for exploration with his life. He lost the race to reach the South Pole – to his Norwegian rival (3) Roald Amundsen, who raised his country's flag on the polar ice (4) on December 14, 1911.



A dancer in a silent world

Triumphing over silence

From Milan's La Scala to New York's Carnegie Hall, Chinese Tai Lihua is celebrated on all the world's greatest stages. Like no other dancer, she is in step to the music – a music she will never hear.



Tai Lihua as "The Thousand-handed Goddess of Mercy." She is both principal dancer and choreographer of the China Disabled People's Performing Arts Troupe.



Tai Lihua uses sign language to instruct members of the ensemble (left). On stage, the dancers put their instructions to work (above).

A person can fight for their dreams as long as they live," signs Tai Lihua silently. Using her hands to communicate, the 34-year-old Chinese woman's use of sign language gives visual emphasis to her words.

Tai Lihua is a true pioneer. She has explored uncharted waters and, as a woman with disabilities, has achieved the unbelievable: just as much in the dance world as in society.

Tai Lihua's story begins with a fever. As a two-year-old, she fell terribly ill and had to take antibiotics, which resulted in a loss of hearing. Her parents did not realize what had happened at first and assumed Tai Lihua was a slow developer. The other children teased her unmercifully, for instance when blindfolded she was unable to recognize her playmates by their voices. For deaf Tai Lihua, an impossible task.

At seven, when Tai Lihua entered a school for the deaf, she had a life-altering experience. A teacher would beat a drum to help the children understand rhythm. The young girl felt the vibrations through the floor. "I was overwhelmed and touched the planks with my fingertips so that I could experience the beat more intensely," she says. "The rhythm spread through my whole body. I felt my heart beat as one with the ground. From that moment on, I wanted to be a dancer."

Tai Lihua's parents gave her ballet shoes and she practiced until her feet hurt. At 15, she was discovered by the China Disabled People's Performing Arts Troupe, a renowned ensemble of the visually and hearing impaired, and artists with other physical disabilities. "They were all so good, I was afraid I would not be able to keep up," says Tai Lihua.

She worked hard, never giving up. Tai Lihua got up at five o'clock in the morning to rehearse with the Peking Opera. When she saw "The Soul of the Peacock," choreographed by Chinese star Yang Liping, on television, Tai Lihua got her hands on all the video tapes and studied them carefully. Among her first audiences: Yang Liping herself. After a private

screening, Yang Liping held a cloth over her face to hide her tears and told Tai Lihua, "You are incredible!"

Tai Lihua has been the principal dancer and manager of the Chinese ensemble of over 100 disabled artists since 2005 and has performed with her troupe in more than 50 countries. As she explains, "like a book, each country is interesting in its own way." Tai Lihua is the only Chinese to have danced at both New York's Carnegie Hall and Milan's La Scala. Whether at the Opéra National de Paris, a telethon in Las Vegas or the Great Hall of the People in Beijing, she moves the audience to tears. Her performances graced the closing ceremony of the 2004 Paralympics in Athens and the opening of the 2008 Paralympic Games in Beijing.

Tonight she is performing in Zagreb. With 21 beautiful, sparkling gold-clad dancers hiding behind her, Tai Lihua is transformed into "The Thousand-handed Goddess of Mercy" – the name of the dance. In synchronous motion, the dancers open their arms and move them through the air to form a circle all to the beat of spiritual music from the Far East.

Though Tai Lihua can feel the rhythm in her body, it does not compensate for her lack of hearing. So she keeps in visual contact with her teachers and the other dancers, whose movements and rhythms she has memorized.

Tai Lihua is not just a star on the stage. In May 2010, she became the first hearing-impaired person in China to get a driving licence, which up to that time had not been possible for people with such disabilities. Tai Lihua is at the forefront in the fight for the rights of the physically impaired: Since 2009, she has been campaigning successfully for better education for disabled children, wheelchair-accessible entrances and Accessible Pedestrian Signals.

And so it is that a pioneer in art has now also become the face of a modern China. ●

ADRIAN GEIGES



Be enchanted by Tai Lihua:
www.audi.com/ar2010/rhythm

Exuding hope

Tai Lihua says:
"One should look at the
unfortunate side of
life through the filter
of a happy heart."



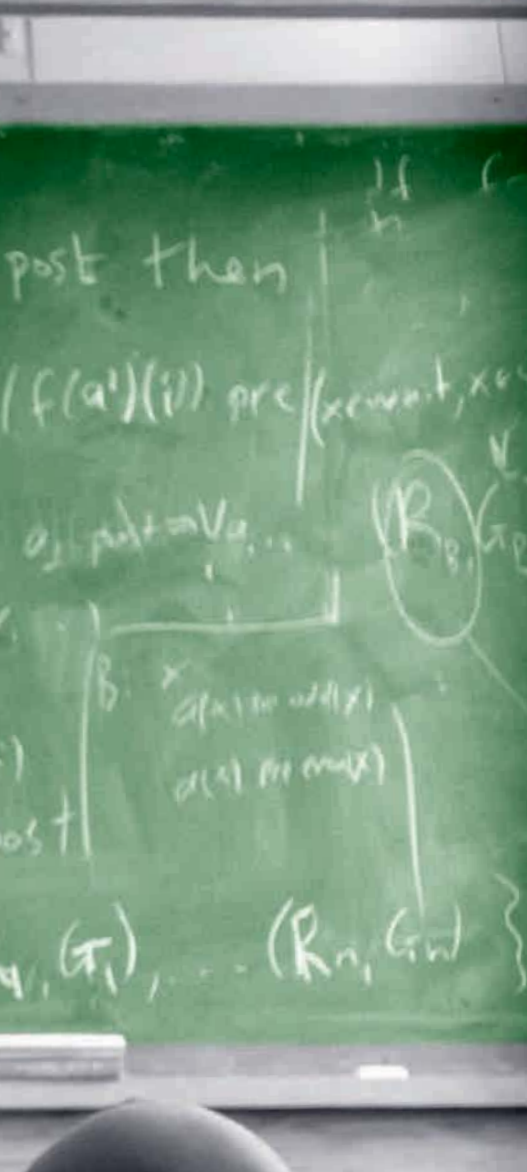
Advances in IT

The Web – for everyone, anytime, anywhere

Over 20 years ago, Tim Berners-Lee co-invented the World Wide Web. Today he is investigating models that will allow people to communicate in the coming age of mobility.

World Wide Web co-inventor Tim Berners-Lee has been teaching at the Massachusetts Institute of Technology (MIT) since 1994.

PHOTO | EDD QUINN/CORBIS



WLAN included

Online anywhere, anytime – to achieve this, Audi has fitted the new A7 Sportback*, A8 and A8 L* models with a dedicated WLAN hotspot. “The new A8 already features extensive information-networking technology. In the MMI navigation plus system, for example, data from Google Earth is linked to our navigation routes,” explains Klaus Straub, Head of Information Management at AUDI AG.

When he speaks, he seems at times to be off in a different world, singularly possessed by his own ideas. His thoughts flow faster than his words. Meet Tim Berners-Lee, son of a mathematician couple, British scientist, physicist and former programmer at the European Organization for Nuclear Research (CERN) on the outskirts of Geneva, Switzerland.

The 55-year-old is the creator of a system for networking information that changed the world like virtually no other invention in modern history: the World Wide Web. Back then the young computer scientist, whose aim was to quell the information chaos at CERN, could scarcely have imagined the ramifications the program he developed in 1989 would have – a program that led to the launch of info.cern.ch, the world’s first web server, at Christmas-time 1990.

Berners-Lee was not interested in patenting his ideas – and passed up a fortune as a result.

One of Berners-Lee’s oddities is that he, ever the researcher and idealist, decided not to patent his ideas or technologies – and passed up a fortune as a result. Any fuss about himself he dislikes, abhors even. He only gives presentations if the convention and the topic interest him, regardless of how much money is offered.

Even so, Berners-Lee has received a number of awards over the years. A few of them – such as the million-dollar Millennium Technology Prize (2004) – had such a hefty purse attached that they came as a “pleasant surprise” for Berners-Lee.

Today the Internet is omnipresent. Laptops, smartphones – there’s hardly anywhere in the world that isn’t online. Berners-Lee sees the future of the Web in open, linked data, a system for interlinking information to make it freely accessible to everyone. Thus he recently created a government website

that offers the public access to data acquired by the government for official purposes. Similar sites exist in ten other countries – in the United States, as well as places such as Australia and Norway.

Berners-Lee – for whom, still today, “generality and portability are more important than fancy graphics techniques and complex extra facilities” – is interested in the ongoing development of the Web as a tool for advancing humanity. “I hope the Internet will help people in the various countries on Earth to understand each other better,” says the scientist, who was knighted by the Queen in 2004, “so that they will all be able to enjoy the same dignity and the same rights going forward.” What might sound dramatic from someone else is quite sincere coming from Berners-Lee. Since 1994, the year he moved from Geneva to the East Coast of the United States, he has been working as Director of the World Wide Web Consortium (W3C), which he founded, to safeguard uniform technical standards.

The next challenge for Berners-Lee: to develop the “Semantic Web.”

In the future Berners-Lee, who sees the Web as a relatively incomplete system that must continue to be developed, plans to devote himself increasingly to the organization of the “Semantic Web,” a web of data in which context is coded along with pure information, thereby enabling associative links – much like the human brain.

Anyone who believes this man is as humorless as he is modest is mistaken. One of Berners-Lee’s party tricks – though seldom performed – is his perfect imitation of a 28-kilobit modem from the early nineties, complete with that unforgettable whistling, rasping, hissing and beeping. ● HELGE HOPP



An audio version of this article is available at: www.audi.com/ar2010/internet

Space travel

The first SUV was driven on the moon

The Apollo 15 mission marked the first time a vehicle – the Lunar Roving Vehicle (LRV) – was used on the moon. Driver and NASA astronaut David Randolph Scott tells of his greatest adventure.

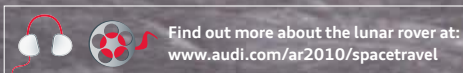
David Randolph Scott is a member of one of the most exclusive clubs in the world. But he is not an ex-president, nor was he the Pope. No, Scott was on the moon. He spent over 18 hours trekking in the dust. One of only 12 men ever to set foot on our natural satellite. Even more importantly: He was the first astronaut ever to drive a vehicle on the moon, which he affectionately refers to as “our SUV.”

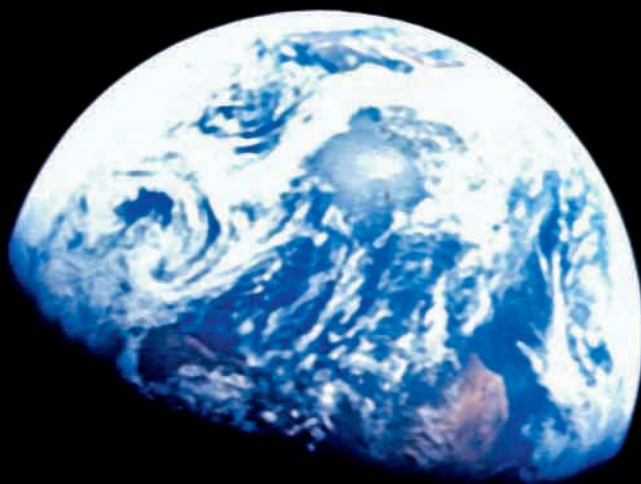
Development of the Lunar Roving Vehicle, LRV for short, began in October 1969, three months after Neil Armstrong had become the first person ever to walk on the moon.

17 months later, with over 10,000 engineers and technicians at work on the project and a budget of 40 million U.S. dollars, NASA had its first LRV.

Designing a vehicle for the moon was truly pioneering work. It only has one-sixth the gravity of the Earth. A person weighing 80 kilograms on Earth weighs just 13 kilograms on the moon. But because muscle power does not decrease on the moon, the same person can jump a long way with little effort. Accordingly, the LRV required little energy to move. But due to the lack of atmosphere, the traditional combustion engine with gasoline or diesel fuel did not work. The solution was an electric drive system.

When David Randolph Scott is asked how he learned to drive on the moon, the 78-year-old has to laugh. “It’s not really something you can learn,” he says. Of course, he recounts, he practiced which switches to operate and how the joystick worked back on Earth. Again and again he drove around in circles during training, and turned the television camera in the rover on and off as part of the testing. “But that doesn’t tell you how the chassis will respond on the lunar surface,” explains Scott. His voice still resonates with the optimism so characteristic of the NASA heroes of the moon flight era. Once on the moon, Scott recalls, he put the rover to the test very slowly at first. As soon as he





was familiar with the response, he stepped on the gas and attempted to “drive as fast as possible.” You could compare the lunar surface with the deserts in California. “It is extremely uneven and covered with fine, slippery dust,” explains Scott. “I tried to negotiate the constantly changing formations as well as I could.”

Still today, Scott is extremely impressed by the engineering feat: “The LRV was a superb vehicle with an excellent design.” He can’t tip his hat enough to the people who designed and built it. He also considers every penny of the astronomical price well spent: “Measured against the benefits, the LRV was pretty cheap.”

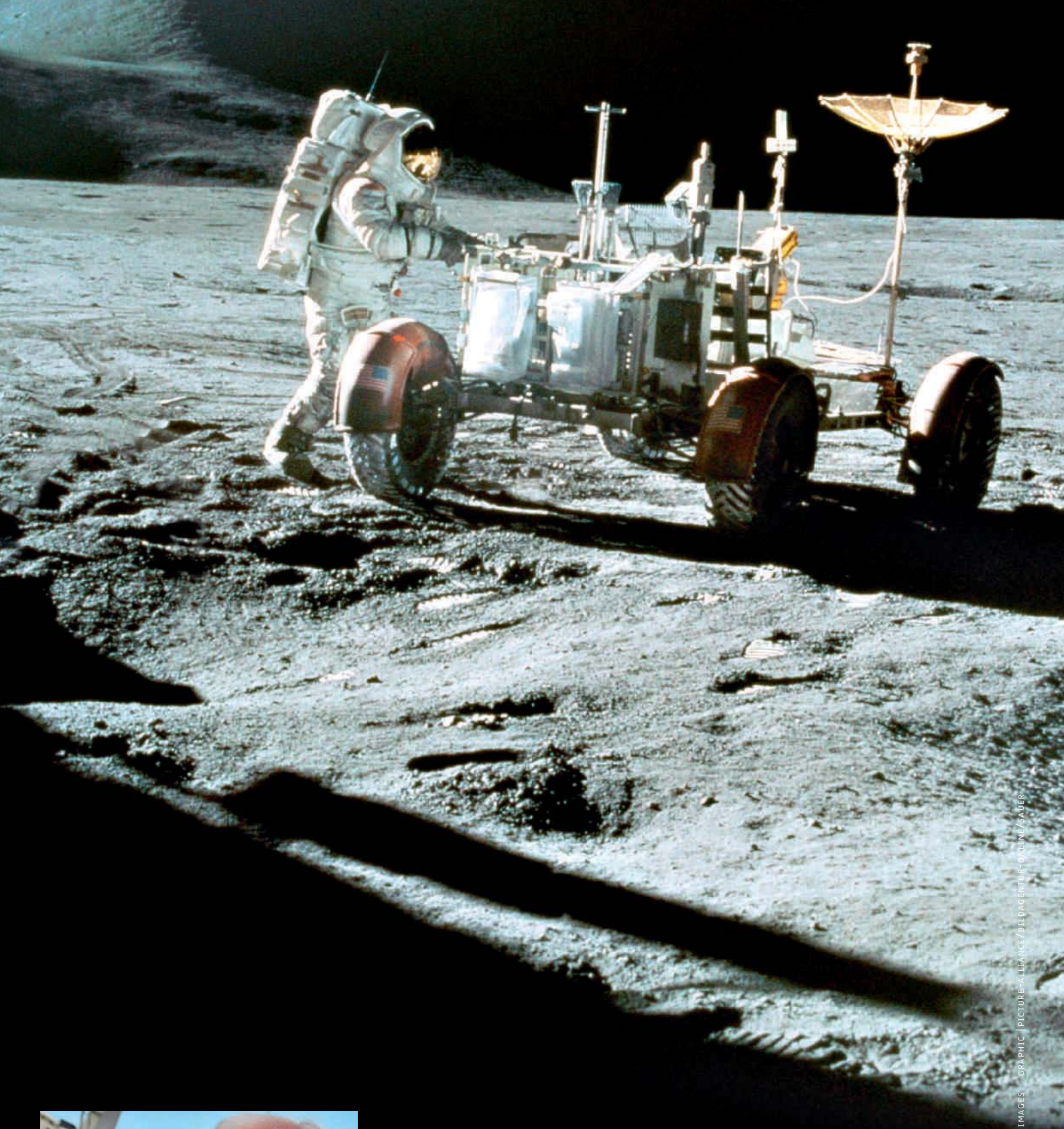
In terms of mechanics, the lunar rover was far ahead of its time: battery-powered wheel hub motors attached via a harmonic drive reduction unit, independent wheel suspension on torsion springs and fluid-free finned radiators. The wheels were made of spun aluminum wire and covered with titanium chevrons.

The maneuverability was just as impressive: step climbing capability 25 centimeters, crevasse crossing 50 centimeters, 25-degree gradability, 80-degree overhang angle (front and rear), 35-centimeter ground clearance, rollover-resistant to 45 degrees on all sides. But the top speed was nothing to write home about: The relatively

light vehicle, weighing 210 kilograms, achieved only 14 kilometers per hour. Fast enough for Scott. If you go too fast, you can’t tell where the bumps are. The LRV bounces over scattered boulders; each crater is a surprise. “I was really impressed by the performance,” says Scott, who sat in the lunar rover back then with the pilot of the Lunar Module, James Benson Irwin. He tells of a hill they drove to the top of: “It had about a 13 percent grade.” The surface was like powder snow. On that terrain, you could hardly walk a single step. “It wasn’t until we got out at the top and looked around that we realized how high up we were,” Scott recalls today.

The Apollo astronauts had a continuous view of their home planet some 400,000 kilometers away.





David Randolph Scott, astronaut

The Air Force Colonel was Commander of the Apollo 15 mission. On July 31, 1971, the American was the first person to drive a vehicle on the lunar surface.

In the dusty gray of the lunar surface, navigation is a problem. Especially at a time when there was no GPS, and the computers on the Apollo spaceship were less powerful than an MP3 player today. So how did they do it? Scott says: "We had maps, but they weren't very good ones. And we had a navigation

system that consisted of an odometer and a directional gyro unit." It was switched on at the landing site. The astronauts were thus able to determine their distance from the landing module and their angle with respect to it. And because on the moon, the sun always shines from the same direction, a sun

LRV, precursor of modern automobiles

Engineers worked for 17 months to develop the first lunar rover. Many of their developments are still used today in terrestrial vehicles.

“The lunar surface is extremely irregular and is covered with fine, slippery dust.”

David Randolph Scott

Drive system The lunar rover was driven by four electric motors – one on each wheel. Many electric vehicle studies make use of this same idea today.

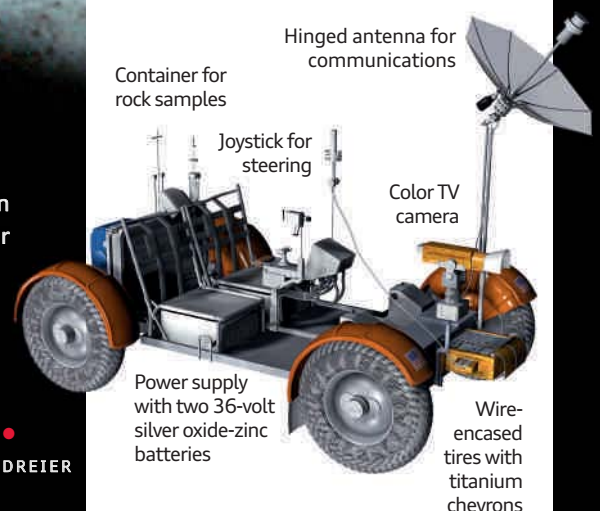
Battery Power in the LRV was supplied by two 36 volt batteries. They lasted for a total of 92 kilometers, but were not rechargeable.

Wheels Each wheel could be accelerated at different speeds. Today’s cars also have this capability – the technology is called the electronic stabilization program, better known as ESP. In addition, both the front and rear wheels on the lunar rover could be steered – like construction machinery.

Lightweight construction The lunar rover was made mostly of aluminum and weighed only 210 kilograms, but could hold a payload of up to 490 kilograms. The lightweight concept reduced the lunar module’s weight.

Navigation The “integrated position indicator” told the astronauts where they were on the moon – a precursor of today’s navigation systems.

Lunar Roving Vehicle (LRV)



shadow device on the center console of the LRV also served as a solar compass.

Scott and his passenger traveled 27.8 kilometers during their Apollo 15 mission. “The LRV allowed us to explore three completely different regions of the moon for the first time and take some extremely important rock samples.” An LRV was also used in the

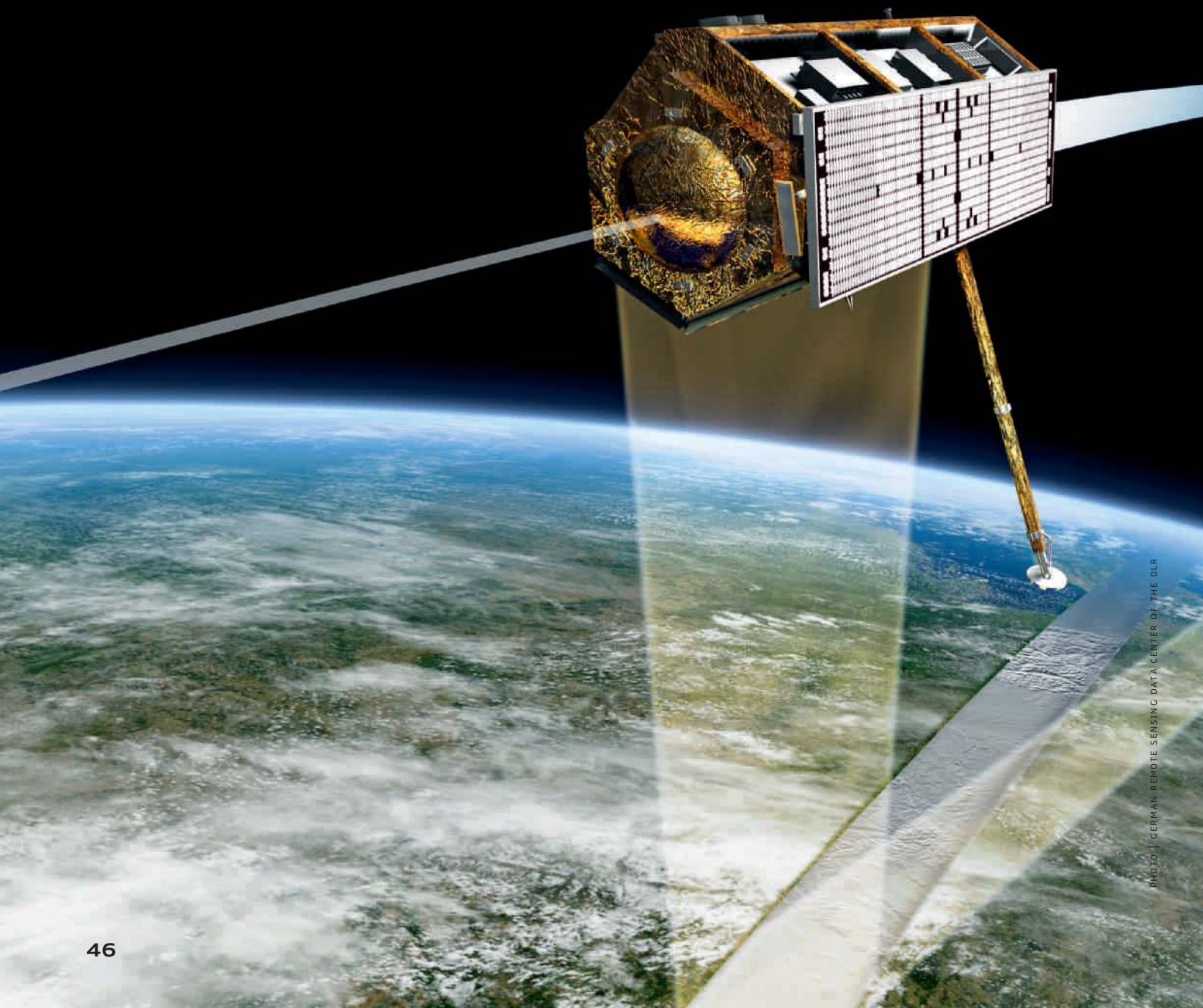
last two moon landings to date, in 1972. “The LRV was a godsend for us,” says Scott. When asked whether every other car isn’t a bitter disappointment for him since driving the LRV on the moon, he says with a laugh: “That really depends on the car.” ●

JAN DREIER


Navigation of the future

Remeasuring the world

There are still white patches on the world map. And so, the Earth is currently being remeasured by satellites. Accurate to two meters and in 3D. A revolution – for navigation systems, too.



Formation flight: The satellites TerraSAR-X (left) and TanDEM-X will measure the Earth's entire land surface in just three years.



It's actually hard to believe that *Measuring the World* became a bestseller. The book, in which two 19th-century scientists travel around the world drawing maps, is over 300 pages long. In this age of navigation systems and Google Earth, in which every square mile of the Earth has supposedly been measured, photographed, and mapped out, who would be interested in such a story?

Apparently, a surprising number of people. Since 2005, Daniel Kehlmann's bestselling novel about German explorers Alexander von Humboldt and Carl Friedrich Gauss has sold more than two million copies in Germany alone. The subject matter presented by this German author is one people find fascinating. After all, even in an age in which nearly 1,000 active satellites orbit the globe, we are still a long way from knowing all there is to know about the 150 million square kilometers of land surface that covers the Earth. The Earth continues to be measured. In more sophisticated ways, more completely, and more accurately than ever before. Audi customers will also benefit from this; with the future navigation systems, they will be able to find buildings, plazas and streets even more easily.

Look for the place from which these measurements are controlled, and you will find it in Upper Bavaria. In Oberpfaffenhofen, in the district of

Starnberg, a municipality between Munich and Lake Ammersee. Located just next to an airplane landing strip is one of the 13 sites of the German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt, DLR): This is a modern glass and concrete building in which what you might call the "navigator" descendants of Humboldt and Gauss are at work. Some 150 years after their death, their dream of navigating with high levels of precision might finally be achieved. In Oberpfaffenhofen, 200 DLR employees are in control of the two most important navigation and Earth observation – or mapping – projects of our time.

Manfred Zink is one of them. The department head at DLR quite literally has his eye on the two satellites that are supposed to remeasure the world from an altitude of over 500 kilometers. TerraSAR-X, together with its twin TanDEM-X, traveling only 200 meters away, will create a 3D elevation model of the Earth's land surface. So accurately that the topography of the Earth will be measured with a vertical accuracy of two meters.

Zink and his team are responsible for mission control – from monitoring the two satellites to generating data. Last fall, he "got butterflies in his stomach" when the two satellites fell into their tight formation flight, since nothing like that had ever been attempted before.



The new Audi navigation system plus

The image – here a detail map of Venice – is based on data from Google Earth. Buildings, plazas and streets are even easier to recognize than before.

“Neither satellite knows the other exists, so to speak. And that makes it especially difficult to coordinate the two radar systems precisely and keep them synchronized,” explains Zink. The data from space is scheduled to arrive at DLR in Oberpfaffenhofen by 2013. It will provide enough information to fill 200,000 DVDs.

A few buildings away is the main headquarters for the second project that could revolutionize navigation. Called Galileo, it is a European Community program involving 30 operative satellites, which will at one point begin transmitting navigation signals to three frequencies. This will make it possible, for example, to locate every position to within an accuracy of three meters. With its 24 satellites, the GPS system commonly used today is only half as accurate.

The DLR Gesellschaft für Raumfahrtanwendungen (GfR) mbH, a DLR e.V. company, is headquartered in the Galileo Control Center. Its main job is to prepare and operate Galileo. Christian Arbinger heads Operation Services at the Control Center in Oberpfaffenhofen. Like his colleague Zink, he currently tracks the status of the Galileo satellites in simulations and testing on the monitors in the Control Center. Two test satellites are already in orbit; the first two satellites for the future Galileo constellation are scheduled to launch soon. According to plans, 18 satellites will broadcast the first navigation services in 2014. After that, Galileo will be expanded

to its full scope of 30 satellites. Arbinger is proud of his project. It will take 100 scientists to control all of the satellites. “Galileo may be the third global navigation system after the American GPS and the Russian GLONASS,” says Arbinger, “but it’s the first civilian system of this kind, and is, in a sense, Europe’s flagship project.”

And one that will open up new possibilities for navigation systems of the future. They will be capable of processing signals from both GPS and Galileo, meaning they will have more than 50 navigation satellites at their disposal. That is important for eliminating blackouts caused by a failure to receive signals from space, a regular occurrence today in urban canyons.

The future 3D elevation models and the Galileo satellites will also be a boon for the navigation systems in Audi cars. “We will be able to tell with even greater accuracy when a street becomes steeper or slopes off,” says Dr. Stephan Reitzner, Team Coordinator for Navigation Systems at Audi. This will make it possible to lower fuel consumption and increase a car’s range, he adds. “With accurate elevation data, we will also be able to improve transmission settings on cars and calculate economical routes.” Economical routes are very important for electric cars in particular, as every recharging stop is a time-consuming matter. “Thus it might be possible to make a round trip on a single battery charge,” says Dr. Reitzner.

He and his team also use a backup system, which is currently showing its strengths in cities like New York and Chicago, where the average building is 40 stories high. Thanks to a number of additional sensors, Audi navigation systems do not lose their bearings, even if they lose contact with the GPS for an extended period. “The car navigates virtually on its own,” says Dr. Reitzner. Humboldt and Gauss would certainly have been pleased. ●

OLIVER RICHARDT

The control center in Oberpfaffenhofen: The Galileo system’s satellites will be controlled from this modern glass and concrete building in the future.



Find out more about the navigation of the future at: www.audi.com/ar2010/navigation

The dawning of a new age of efficiency



Light
but strong –
all in a day's work
at Audi (p. 50).



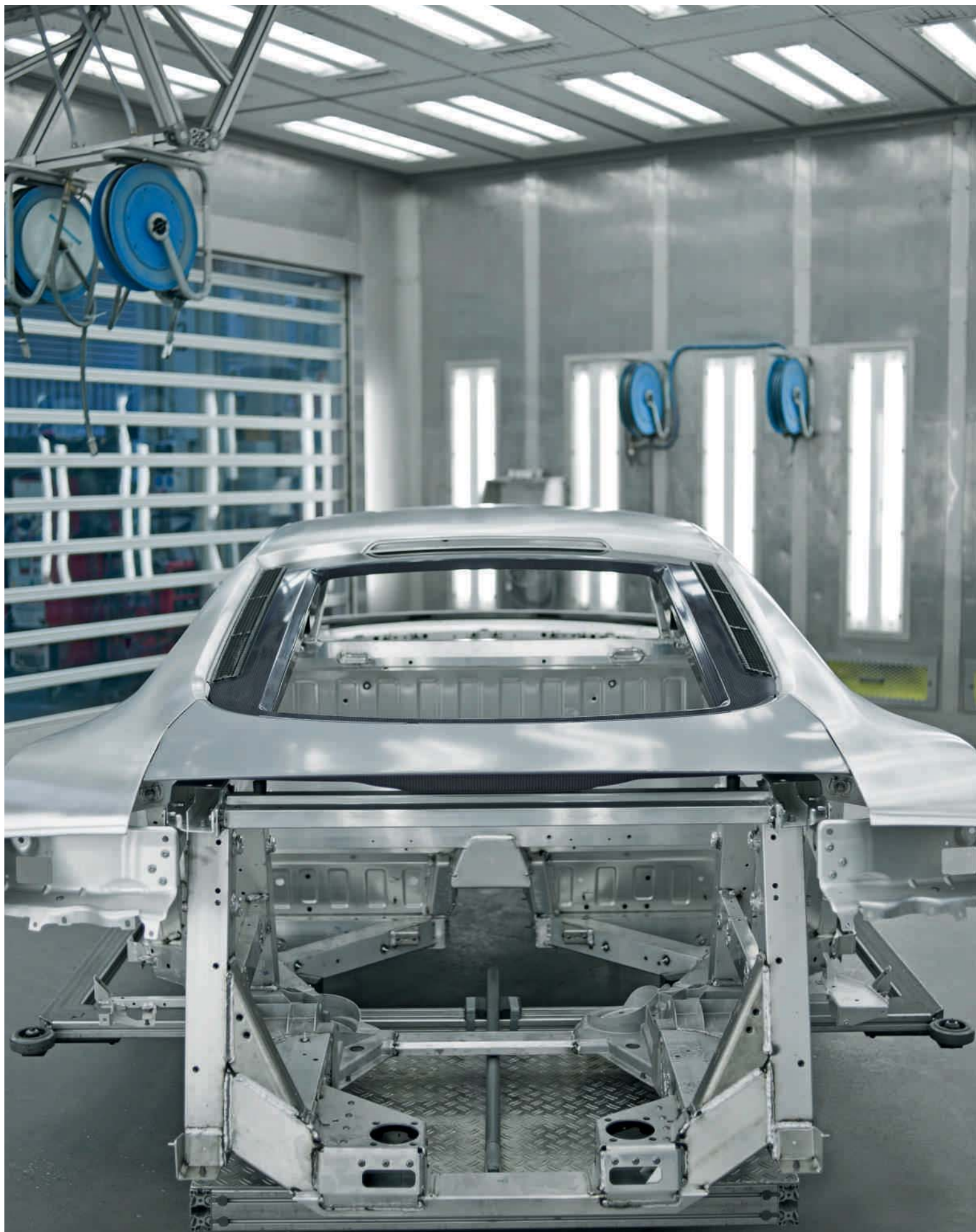
Waiting for its first 24-hour race at Le Mans:
the new Audi R18 (p. 60).

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“Less is more” is the motto at the
Audi Lightweight Design Center. A visit.

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The Audi Q5 hybrid quattro* will go
into production in 2011.

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Olympic fencing champion
Britta Heidemann tests the S tronic.

60 **A question of faith**
Audi developed a new racing car for
Le Mans in just one year.



The rear lid of the Audi R8 GT* is made of carbon fiber-reinforced plastic (CFRP). This is the ideal material for a high-performance sports car owing to its minimal weight and high strength.

Lightweight design

Lean family

Lightweight design is one of Audi's great strengths. This core competence of the brand is being systematically expanded at the Audi Lightweight Design Center in Neckarsulm.

The motivation has to be right," says Heinrich Timm, who for many years was Head of the Audi Lightweight Design Center in Neckarsulm. Even when meeting Timm and his successor Dr. Lutz-Eike Elend for the first time it is clear that they have the right motivation. Elend, who holds a PhD in production engineering, took over from Timm in November 2010 and is continuing the successful work of decades past that made Audi one of the leading brands internationally with regard to lightweight design.

Heinrich Timm, a pioneer of lightweight design, is retiring, but only partially. He will continue to share his valuable experience with the Company as a consultant. The Audi Space Frame (ASF) technology was developed under his leadership in the mid-1990s, sparking many new developments in the field of lightweight design.

The motivation in Neckarsulm is also right in another regard. After Audi established a special Aluminum Center for development, production planning and quality assurance here in 1994, lightweight design was systematically expanded into one of the brand's core competences. This is due primarily to the fact that a very diverse range of expertise is pooled at the site. "Our work involves the entire process chain," explains Timm.

Lightweight design starts with suitable materials, the development of new, higher-performance alloys and materials, continues through structural design, computation, materials technology and production planning to quality assurance. Specialists in each of these fields work under one roof in Neckarsulm.

Lightweight design is a strategic task for Audi; after all, comfort,

performance and safety requirements bring with them an increasing amount of weight. "One of our most enduring aims for the future is to reverse the weight spiral," says Michael Dick, Member of the Board of Management for Technical Development at AUDI AG.

Audi has incorporated a large number of groundbreaking innovations in lightweight design into production models.

The reversal of the weight spiral harbors significant secondary effects. By its very nature, there is a particularly large amount of potential to be found in the body. Compared to steel, an ASF body is at least 40 percent lighter. But the powertrain, the chassis, the electrical systems and the interior can also make major contributions to weight reduction.

Every 100 kilograms saved reduces fuel consumption by around 0.3 liters per 100 kilometers, corresponding to a reduction in CO₂ emissions of roughly 8 grams per kilometer.

Audi has incorporated a large number of groundbreaking innovations in light-

weight design into production models over the last quarter of a century. The Company had already defined automotive lightweight design as a strategic project back in 1982. Many technological milestones and a multitude of patents came along the way to the development of an entirely new body structure, the Audi Space Frame. The mission was nothing more and nothing less than to once again reinvent the self-supporting body, but this time with aluminum, a material that is substantially lighter than conventional steel, and with a new principle.

In 1994, the Audi A8 became the first series production car to use the Audi Space Frame, and the design principle behind it remains valid to this day: Diecastings and extruded sections form a framework-like skeleton that incorporates aluminum panels as co-supporting elements. The components with their various cross-sections and shapes combine optimal function with low weight.

Over 600,000 units of the Audi A2, TT Coupé* and TT Roadster*, A8 and R8 have been built to date using Audi Space Frame technology.

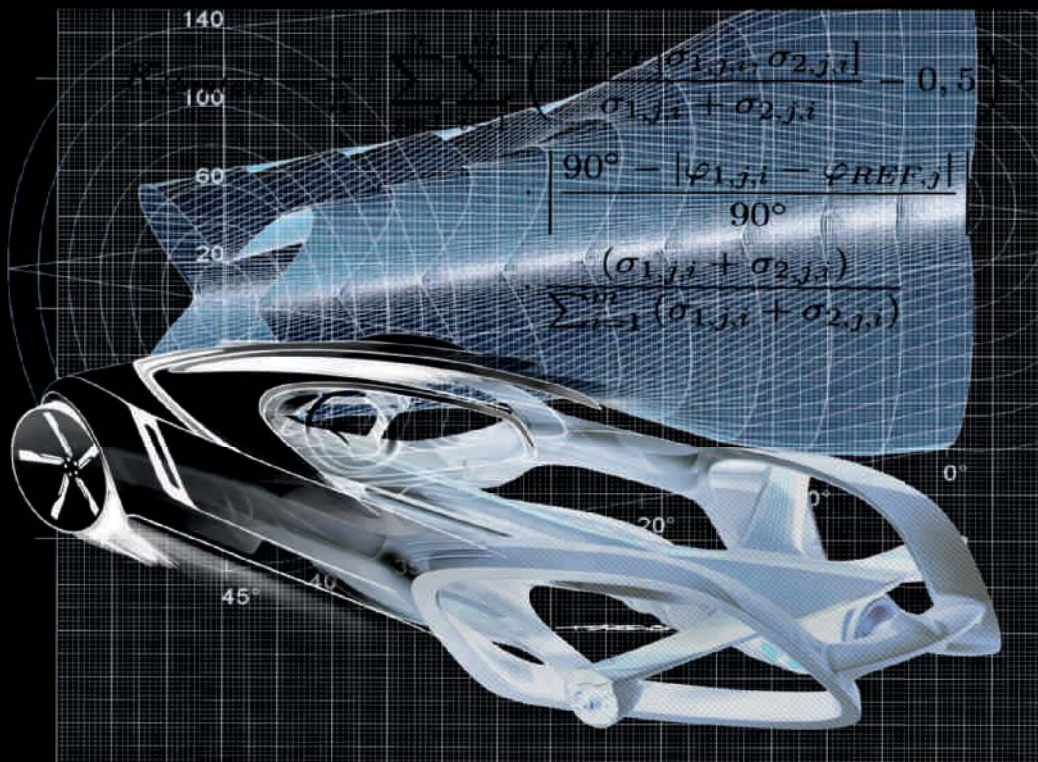


Expertise under one roof (from left): Dr. Lutz-Eike Elend (Head of the Audi Lightweight Design Center), Heinrich Timm (former Head of the Audi Lightweight Design Center) and Albrecht Reimold (Neckarsulm Plant Manager).

Efficiency

Developing the future

Intelligent lightweight design will also apply to future mobility at Audi. New drive systems require new body shapes and thus also the use of new materials, such as magnesium or fiber-reinforced plastics. Computer simulations help the engineers at the Audi Lightweight Design Center to implement this multi-material design in a manner that is appropriate for the materials.



“Lightweight design makes a major contribution to sportiness and efficiency,” says Elend, “and thus to conserving resources and reducing operating costs, which means a direct benefit to the customers.”

The body of the first A8 weighed only 249 kilograms; that of the compact A2 weighed just 156 kilograms. The equivalent figure for the A2 1.2 TDI – the world’s first five-door, three-liter car – was a mere 135 kilograms, which formed the basis for the sensational average fuel consumption of 2.99 liters of diesel fuel per 100 kilometers. “It always takes courage to lead the way,” says Timm today in reference to the groundbreaking concept of the A2.

Today’s models – the new generation of the A8 and the R8, TT Coupé* and

TT Roadster* sports cars – document the current state of ASF technology. The strength of extruded sections is their design flexibility. The side sills of the TT Coupé and the TT Roadster, for example, are identical on the outside, yet because of differences in their internal rib structure vary in stiffness. This is even greater in the Roadster than in the Coupé to compensate for the lack of a roof. “We utilize bionic principles,” explains Timm, which means taking nature as an example. “It’s like with a stalk of wheat, which owes its stability to its special structure.”

Aluminum is now increasingly combined with other materials. The aluminum body of the R8, whose co-supporting engine frame is made

of ultra-light magnesium, weighs 210 kilograms. With the V10 engine* producing 386 kW (525 hp), the entire car weighs just 1,620 kilograms. Its power-to-weight ratio is 3.1 kilograms per hp – the same as that of a well-trained athlete.

The material mix has also found its way into the new Audi A6.

In the new A8, the B-pillars are made of hot-shaped steel for enhanced side-impact protection. The material mix has also made its way into the A6 introduced in late 2010. The structure of the body is made of steel, although it does integrate individual aluminum components, such as the mount for the struts. The outer skin of the new A6 is made entirely of aluminum for the first time.

Audi has increased its lead step by step: in materials, in the intelligent material mix, in joining technology and in production efficiency. “Production’s expertise is already needed in the early development phase of a new model,” says Albrecht Reimold, Neckarsulm Plant Manager, “primarily with respect to subsequent economical use in high-volume production.”

More than 13,000 people work at Audi’s Neckarsulm site. The A8 and the R8 are among the cars built in the spotlessly clean factory buildings there.



High-end material CFRP

The direction has to be right

Carbon fiber-reinforced plastics (CFRP) are an excellent material for not only the aerospace and aviation industries, but also for making cars. They have long demonstrated their strengths in motorsports. Depending on their configuration, they achieve outstanding tensile strengths of 500 to 1,350 Newtons per square millimeter, absorb energy very well, are extremely lightweight and offer the greatest possible design freedom.

A single carbon fiber is only five to eight micrometers thick, or roughly one tenth the thickness of a human hair. As a rule, 1,000 to 50,000 of them are combined to form rovings (strands), which are the base material for the fabric. The layer structure is what determines the material properties: Because CFRP materials are only high-strength in the direction of the fibers, the individual layers are laid down in different directions. They are embedded in a matrix, usually epoxy resin. When the resin cures, the part is finished. The parts are still largely built by hand today. Further developments in production technology are required before CFRP parts can be used in large-volume production.



Visible high-tech: CFRP sideblade of the Audi R8 GT.

Whereas the degree of automation in A8 production is nearly identical to that with a conventional steel sheet body, production of the exclusive R8 high-performance sports car has more of a handcrafted character.

With the R8, the front end, the central floor and the rear end are assembled separately from one another. After the assemblies are joined to form the substructure, the pillars and the large metal panels – primarily the roof, the side walls, the doors and the cover panels – are added. “The key factor is the joining technology,” explains Elend. “We mostly use joining techniques developed and patented by Audi for production.”

The perfect interplay throughout the entire process chain – from development and planning, the building of the machines, fixtures and tools, to the press shop, body shop and the paint shop, all the way through to assembly – all takes place according to Audi’s exacting quality standards.

A fully automatic measuring system checks the dimensional accuracy of each body down to a tenth of a millimeter. The scanner works without contact and uses its 95 laser sensors to check 220 points within five seconds.

A system change in carmaking is looming as a result of electric mobility.

Further extending the lead in structural design and fabrication is also what drives Elend to new innovations. After all, carmaking is once again facing a system change, and this change is bringing with it new tasks for the lightweight design specialists. “Future drive concepts set new requirements for the body and add additional weight to the car,” says the new Head of the Audi Lightweight Design Center. “This presents us with an entirely new set of challenges regarding proper implementation for the materials involved.”

Audi will use lightweight design concepts to offset the significant added weight for electrified drive systems. This also includes the use of innovative materials. It was for this reason that the

Company invested in a new technical center for fiber-reinforced composite materials back in 2009.

In particular, these include carbon fiber-reinforced plastics (CFRP), which Audi will use in an intelligent material mix with aluminum and steel, for example, but also with ultra-light magnesium. The pioneering efforts in the field of aluminum construction will help to transfer the know-how to other technologies and materials. “We know what it means to take a new material to production maturity,” says Board Member Michael Dick, “and we will also demonstrate this with CFRPs.”

Lightweight design is even visible in the R8 Coupé*. Its CFRP sideblades in structured honeycomb look are an unmistakable design element. In the open version, the R8 Spyder*, the percentage of CFRP parts was increased even further. The side panels and the complex top compartment cover are made of the lightweight carbon fiber. “The CFRP hatch yields weight savings of roughly 20 percent compared to aluminum,” says Elend. “This component has such a complex shape that it would not even be possible with metallic materials,” adds Timm, his predecessor under whose leadership the structure of the R8 was developed.

The new materials therefore offer not only significant weight advantages, they also offer new design possibilities. The R8 GT* shows just what potential the composite materials harbor. The rear hatch of the limited production model is made of CFRP for a weight advantage of 6.6 kilograms. The bucket seats, which feature a chassis made of glass fiber-reinforced plastic (GFRP), save 31.5 kilograms.

In the future, the challenge will lie in the ability to also produce ultra-light materials economically in large volumes. So the lightweight design specialists from Neckarsulm will not be short on work – and certainly won’t be running out of ideas. ●

THOMAS AMMANN



Visit the Audi Lightweight Design Center: www.audi.com/ar2010/lightweight

Audi Q5

hybrid
quattro



Efficient novelty

The groundbreaker

In 2011, Audi will launch the Q5 hybrid quattro*, the first volume-produced Audi to combine a gasoline engine with an electric motor. It is the forerunner for an entire family of hybrid models.

That's how it is with the future: It approaches very quietly. At least in the case of the new Audi Q5 hybrid quattro*. The first encounter with the car can be a very special experience. A press of the starter button and then ... nothing. No starter sounds, no rumble at idle. Just silence. The Audi Q5 hybrid quattro conveys an entirely new driving sensation even while standing still.

When looking for the tachometer, the driver finds in its place a power meter, whose needle is on "READY," as in ready to start. It is, of course, not true that nothing happens when the car is started. Two powerplants – a 2.0 TFSI gasoline engine and an electric motor – are ready to spring into action, and comfort-related functions such as the air conditioner are also operational before the car starts moving. It's just that the driver barely notices any of this, and that is the way it is supposed to be. The technology is there when it is needed, but it doesn't force its way to the forefront.

The questioning glance at the power meter after starting the car will become a habit in the future. But the driving experience in the Q5 hybrid quattro is anything but ordinary – it thrills the driver right from the start. As soon as the driver releases the

brake, the vehicle proceeds solely on electric power and thus with zero local emissions. The car can be driven at up to 100 kilometers per hour in this electric mode without the support of the gasoline engine. This ability makes the Q5 hybrid quattro a full hybrid. All-electric operation requires a delicate touch on what used to be known as the gas pedal, however. A slightly heavier push on the pedal activates the combustion engine as a power source almost imperceptibly for the occupants.

Hybrid drive – this is always a joint venture between an electric motor and a classic combustion engine. The objective is more power coupled with greater efficiency. Together the 2.0 TFSI gasoline engine and the electric motor have a system output of 180 kW (245 hp) and produce 480 Nm of torque. The hybrid model in the successful Q5 series sprints from zero to 100 km/h in 7.1 seconds, while the interim sprint from 80 to 120 km/h takes just 5.9 seconds in fifth gear. Top speed is 222 km/h.

This makes the Q5 hybrid quattro a true hybrid performance SUV and an ideal addition to the model line, which is positioned as sporty and progressive. The Q5 hybrid quattro demonstrates *Vorsprung durch Technik* and combines the Audi core competences of TFSI,

Hybrid technology The power of two hearts

The 2.0 TFSI in the Audi Q5 hybrid quattro produces its power from a displacement of 1,984 cc. Its output is 155 kW (211 hp), with the maximum torque of 350 Nm available between 1,500 and 4,200 rpm. The four-cylinder engine combines direct injection with turbocharging – typifying the Audi philosophy of downsizing, which replaces displacement with forced induction.

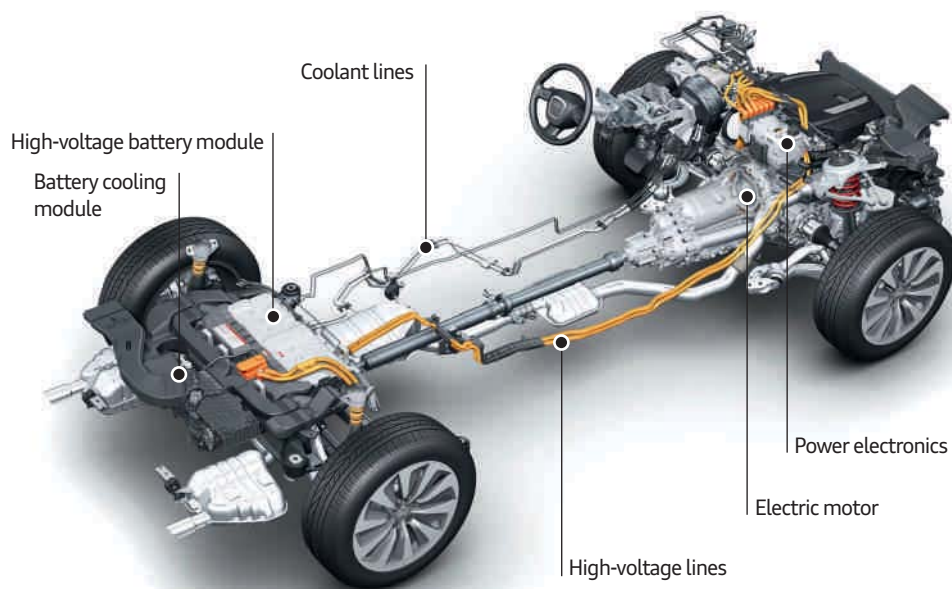
A so-called permanently excited synchronous machine serves as an electric motor, as a starter and – during deceleration – as a generator. It delivers up to 40 kW (54 hp) of power and 210 Nm of torque. The electric motor is integrated in the engine's cooling circuit.

The lithium-ion battery system in the back of the Q5 is air-cooled. It consists of 72 cells; at 266 volts its nominal energy is 1.3 kWh and its output 39 kW.

The 8-speed tiptronic does not require a torque converter. Its place is taken by the electric motor, which is combined with the multi-plate clutch operating in an oil bath. The clutch couples and decouples the electric motor and the TFSI.

With its eight widely spaced gears, the comfortable and fast-shifting hybrid transmission contributes significantly to the efficiency of the Audi Q5 hybrid quattro. When the 2.0 TFSI is inactive, an electric pump maintains the oil pressure in the hydraulic system to safeguard the convenient start-stop feature.

Audi Q5 hybrid quattro powertrain



quattro and lightweight design with innovative hybrid technology.

The vehicle demonstrates that driving in the electrical age means anything but sacrifice. It impresses with the performance and acceleration data of a powerful six-cylinder engine but with the fuel consumption values of an efficient four-cylinder TDI: less than 7.0 liters of gasoline per 100 kilometers in the normal cycle. This corresponds to CO₂ emissions of less than 160 grams per kilometer – outstanding values for an SUV of this size.

Audi is heading for the future with its first full hybrid in the premium segment. “The Q5 hybrid quattro* has a strategic mission,” says Bernd Huber, Technical Project Manager for the Q5 hybrid. “It is the groundbreaker for electrification at Audi.” The hybrid system in the Q5 hybrid quattro expands the Audi modular efficiency platform to include innovative hybrid modules. This forms the basis for its use in other Audi models with longitudinally mounted engines, including the new generations of the A6 and A8 models. You can therefore expect to see the “hybrid” badge on additional Audi models.

Technical development has progressed in leaps and bounds in recent years: downsizing with the

combustion engines, greater use of electronic systems, the development of more powerful battery technologies. With the Q5, Audi is one of the first manufacturers to use a powerful, yet relatively lightweight lithium-ion battery. The compact unit weighs just 38 kilograms and is placed in a crash-protected area under the cargo floor.

The intelligent interplay of the components is what makes hybrid driving so fascinating. The Audi Q5 hybrid quattro can be driven in a number of different operating modes: with the combustion engine alone, with the electric drive alone or in hybrid mode, in which the two systems work together. These modes are managed fully automatically using the hybrid manager in the engine control unit. Power transfer is by means of an 8-speed tiptronic specially modified for use in the Q5 hybrid quattro.

“We want to drive in all-electric mode whenever and wherever possible.”

The driver can easily change between three driving programs using a button on the center console and the gear selector lever. EV mode gives priority to the electric drive, D mode controls both motors for optimal fuel consumption, and S mode as well as

the tiptronic gate are designed for a sporty driving style.

The top priority remains enhanced efficiency. “The development work was focused on a high percentage of electric driving,” says Jörg Kerner, Head of Drive Electrification at Audi. At a constant speed of 60 km/h, the purely electric range is as much as three kilometers, which is sufficient for most residential areas and many inner cities.

And where does the electricity come from? Not from the wall outlet – the Q5 does not use a plug-in system. The electric motor gets most of its energy by means of recuperation, an energy recovery process. During recuperation, the electric motor acts as a generator and recovers energy when the driver brakes or releases the accelerator. The vehicle’s kinetic energy is converted to electrical energy and stored in the drive system battery, so that it can be used again later for subsequent acceleration or to power the vehicle’s energy system.

The payoff from this efficiency comes when starting off. During strong acceleration, or “boosting,” the electric motor and the combustion engine work together; the entire system output is briefly available during acceleration under full load.

The Q5 hybrid quattro comes with a new display concept for the individual driving states. The power meter shows



Keeping things in check: The power meter (left) and the display in the middle make the various driving modes of the hybrid drive transparent and show the power flows.

Types

Hybrid technology

Micro-hybrid

A micro-hybrid uses a start-stop system and energy recovery to save energy. Kinetic energy is converted into electrical energy and stored in the vehicle battery. This relieves the load on the generator and the combustion engine, and saves fuel.

Mild hybrid

Mild hybrids have an additional electric drive which temporarily supports the combustion engine in unfavorable operating conditions. However, the electric motor's output and the battery capacity are not sufficient for all-electric driving. Audi has omitted this interim technology and is focusing

on full hybrid technology in its development work.

Full hybrid

With this technology the electric motor can temporarily power the car on its own. The planned Q5 hybrid quattro, A6 hybrid and A8 hybrid models are members of this category.

Plug-in hybrid

On the plug-in hybrid, the battery can be additionally charged up using a regular power socket. Longer distances can be covered using only electric power. In 2010, Audi unveiled a concept car with plug-in hybrid drive: the e-tron Spyder.

the Q5 hybrid quattro* is one of the lightest hybrid SUVs on the global market. All its hybrid components add less than 130 kg extra weight. The Q5 hybrid quattro offers the same generous level of standard equipment as its sister models, although some components such as the air conditioner have been adapted to the requirements of electric driving. The compressor for the air conditioner features an electric drive that maintains the climate control function even when the combustion engine is switched off.

Options available for the hybrid version also include advanced driver assistance systems normally found only in full-size models. One new feature is the connection to the Internet via the optional Bluetooth car phone. A UMTS module retrieves news and weather information from the World Wide Web to the vehicle. The hybrid SUV also uses the fast connection to download three-dimensional satellite images and aerial photos from Google Earth. These appear as bird's eye views on the monitor; the computer draws in the roads. Another high-end feature is the WLAN hotspot, which allows up to eight terminal devices to connect to the Internet.

Vorsprung durch Technik – the Audi Q5 hybrid quattro is showing the way to the future of mobility. ●

THOMAS AMMANN



See more about the Audi Q5 hybrid quattro here:
www.audi.com/ar2010/hybrid

the overall output of the system on a scale from 0 to 100 percent. Colored segments visualize the states efficiency, boost and recuperation, plus the range possible with electric driving. An analogue display indicates the charge status of the lithium-ion battery.

At the same time, the display of the driver information system and the large monitor of the standard MMI navigation plus system use 3D graphics to show the operating states and power flows in the hybrid system. The MMI monitor also shows how much energy is currently being consumed or recovered. In practice, all of this information makes a valuable contribution to efficient driving.

While driving, it quickly becomes clear why the Audi Q5 series is enjoying such great success in the premium mid-size SUV segment in Europe. The quattro all-wheel drive system guarantees superior road characteristics in virtually any situation, the seating position just "fits," all-around visibility is outstanding, and you get the feeling of driving one of the sportiest SUVs in its class.

Measuring 4.63 meters in length, 1.88 meters in width and a mere 1.65 meters in height, the proportions of the Audi Q5 play a role here, as does the intelligent lightweight construction, which Audi rigorously pursues in the hybrid version, as well.

The tailgate and the engine hood are made of aluminum. The rigid body shell incorporates hot-stamped steel at numerous places, combining low weight with very high strength. With a curb weight of less than 2,000 kg,

In March of last year, Audi presented the hybrid study of the A8 luxury sedan to a global public.



Efficiency



S tronic

The perfect moment

Olympic women's fencing champion Britta Heidemann and the Audi S tronic dual-clutch transmission have something in common: Both have to respond instantly and precisely.

Zap!" says Britta Heidemann and gives the shift paddle at her steering wheel a tug. The fencing champ wants to get going, from Munich Airport onto the autobahn, to Audi in Ingolstadt. The next "zap," third gear, then "zap" again, fourth gear. No perceptible jolts. The S tronic transmission shifts gears the way Heidemann fences: smooth, fast, precise. If she pulls the right shift lever, she is shifting up, a tug on the left and she's shifting down a gear.

Of course it isn't easy to compare a transmission with a fencer. But this 28-year old from Leverkusen isn't just any woman handling an épée. She's the only woman fencer in the world to ever have been Olympic champion, world champion and European champion at the same time. So if anyone knows how to move with smooth precision, she's the one.

This links her with Michael Schöffmann who, at 49, is in charge of Transmission Development at AUDI AG. "The S tronic is one of the best transmissions in our product line," he explains. If you ask Schöffmann what's really important in a 7-speed transmission, his answer sounds a lot like Britta Heidemann.

"It has to go zap, zap, zap," he says succinctly, "almost without interrupting tractive power." That means no jolts, no breaks. The driver experiences a perfect moment.

Heidemann doesn't like automatic transmissions. "I'm a fan of old-fashioned manual shifts," she says.

"I like to make the decisions. When I want second gear, I don't want to wait till an automatic shift brings it on with a few jolts." When it seems like someone else is in control, it smacks of defeat to her.

But the S tronic is no ordinary automatic transmission. "The S tronic is the synthesis of a highly efficient manual transmission with the convenience of an automatic," Schöffmann explains to the fencer. The technology behind it is the dual clutch. One of the two clutches in the car serves the odd-numbered gears plus reverse, the other clutch handles the even gears. "When one part of the transmission is shifting, the other part is already engaged in the next gear. You might say it's standing by," says Schöffmann. In other words, as soon as Heidemann says "zap" and shifts up, it takes only two-tenths of a second until one of the clutches opens and operates, while the other clutch closes.

Heidemann doesn't have much more time than this on the fencing piste when she wants to dodge an attack. "I have to anticipate my opponent's next move," she confides, "I've got to figure her out." Ever since Heidemann first donned a fencing mask at age 14 she had to learn to think like that. Not just in competition – in training too.

"But how can the S tronic transmission predict whether the next gear is supposed to be higher or lower?" asks the fencing champ. What a car driver will do next seems just as hard to guess as the next move of a fencing opponent.



Experts on precision

Olympic fencing champion Britta Heidemann talked with Michael Schöffmann, Head of Transmission Development at AUDI AG, at the Audi Forum Ingolstadt.

"The S tronic has some tricks of its own," Schöffmann responds. Sensors measure how fast the driver is accelerating, and whether he is going uphill or downhill. They measure whether he's just cruising or driving more aggressively, at high or low revs, and with how much transverse acceleration. "Depending on what the electronics anticipate, the S tronic engages the next gear up or down on the other part-transmission," Schöffmann explains. This dual-clutch system can even look into the future. A link to the navigation system enables the S tronic to analyze the road ahead, for instance whether a fast straight or a slow curve is next.

For Heidemann one more right turn is coming up, the one into the Audi site in Ingolstadt. "Zap," says the fencing champ, tugs on the shift paddle and turns off the road. ●

SVEN SCHULTE-RUMMEL



Find out more about the S tronic transmission at:
www.audi.com/ar2010/s-tronic

Speed scores

Britta Heidemann and the new Audi RS 3 Sportback* with 7-speed S tronic dual-clutch transmission.



* Fuel consumption and emission figures at the end of the Annual Report

Racing: 24 Hours of Le Mans

A question of faith

Audi needed just one year to develop the R18, a completely new Le Mans prototype with which the brand hopes to claim its tenth victory in France on June 11. An amazing feat on the fast track.



The Audi R18 is a new development: the carbon-fiber chassis, innovative LED lighting technology – and a roof.



**Le Mans at night:
The racing circuit
demands maximum
concentration.**



The city of Le Mans lies in northwestern France. Its two claims to fame – the Cathedral of Saint Julien and the world's most legendary motorsport race, the 24 Hours of Le Mans – could hardly be more different. And yet they share a striking similarity: faith. It is the lifeblood of both.

On June 11 this year, the world will see whether Audi placed its faith wisely. In a completely new car, a diesel engine and a roof, after nine victories with open Le Mans prototypes.

The starting gun for the legendary struggle between man, machine and the opposition sounds at 3 p.m. Held for the first time in 1923, the race was intended to demonstrate a vehicle's durability. This original idea has endured to the present day more or less unchanged.

The Circuit de la Sarthe is extremely fast and dangerous, covering nearly 14 kilometers of mostly public interurban roads that are closed for the race. Dips and ruts are among the particular challenges posed by this course. Structural changes were made to the circuit in 1990 because the racing cars had become too fast. In the early 1980s, for example, drivers reached top speeds of over 400 km/h on the five kilometer-long Ligne Droite des Hunaudières straight. Despite the addition of two chicanes, the racing cars still reach speeds of nearly 350 km/h. Le Mans is a 70 percent full throttle track. This means that with a lap time of 3 minutes and 30 seconds, the driver spends 2 minutes and 27 seconds at full throttle.

The smell of racing fuel and burned rubber signals the awakening of the Queen of Motorsports. And heroes are born with the crescendo of the engines on the banks of the Sarthe River. Each year roughly 250,000 motorsport fans cheer on the daring young drivers in their high-tech, carbon-fiber racing machines. Since the first Audi Le Mans prototype debuted in 1999, Audi pilots have stood as winners on the podium and hoisted the heavy trophy into the air nine times already. This year, however, a number of things are different even before the start.

5

questions for Dr. Wolfgang Ullrich

“Le Mans is the biggest challenge in motorsport.”



For more than 17 years, the fate of Audi Motorsport has rested in the hands of Dr. Wolfgang Ullrich. A doctor of engineering and native of Vienna, Austria, Ullrich discusses nodding off, technical efficiency and against whom he would like to compete at Le Mans.

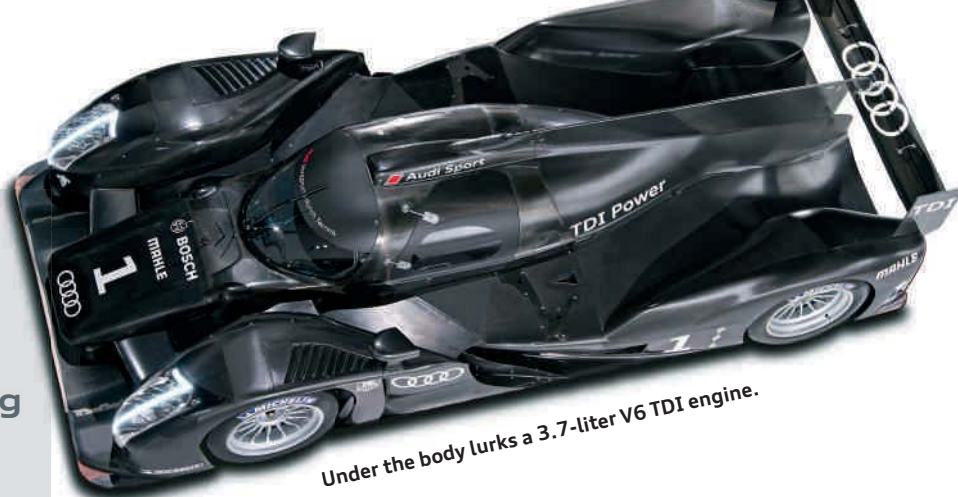
What percentage of the previous car, the R15, has it been possible to carry over into the development of the R18? Zero. The car was developed from scratch. But this effort won't have been in vain. Many ideas from motorsport make their way into production vehicles.

The new rules allow the use of hybrid technology. How far along are developments in this area? We won't use any systems for energy recuperation in 2011. Nevertheless: We are continually working to improve the efficiency of the car.

How much sleep do you get during a race weekend at Le Mans? Normally none during the night of the race. I do sometimes nod off in my chair for few seconds, however.

What does Le Mans mean to you personally? Mastering the greatest challenge in motorsport. You work all year long toward this race, and you have to wait a year for the chance to correct the result.

Which competitors would you like to see come to Le Mans? It would be nice if another premium manufacturer from Germany would find the courage to return to Le Mans. And I emphasize: return.



Under the body lurks a 3.7-liter V6 TDI engine.

There wasn't a lot of time for the development of the R18, as the newest member of the Audi racing family is known. The engineers had just one year to develop a completely new automobile. Compare this to more than four years for the development of a production vehicle. This tremendous feat was made necessary by the late finalization of the rules.

A daunting challenge awaits the cars and the drivers.

Since 2009, the race organizer, the Automobile Club de l'Ouest (ACO), has permitted fewer mechanics to take part in pit stops, doubling their length compared with previous years. The smaller restrictors specified beginning in 2011 also slow the flow of fuel and lengthen the refueling process. Any time saved climbing in and out of the vehicle during a driver change therefore hardly matters. The designers were able to devote their full attention to the aerodynamics. This resulted in the most obvious novelty of the new car: the roof. Dr. Wolfgang Ullrich, Head of Audi Motorsport, explains it like this: “It was clear to us that we had to develop a car with a roof if we wanted to compete for the checkered flag at Le Mans. A closed car simply cuts through the wind better.”

A daunting challenge awaits the cars and the drivers. In this one race, the pilots will cover roughly as many kilometers as a Formula 1 driver does in an entire season. Every last part of the car must withstand these loads until crossing the finish line. Wheel bearings, engine bolts, pistons and hoses – nothing is spared at Le Mans.

This makes the victories celebrated by Audi in years past all the more

impressive. Besides nine victories and the successful introduction of the diesel engine to racing, Audi can also boast of a large number of further triumphs. Last year, Audi took the top three places with the R15. The winning car completed 397 laps in 24 hours and covered 5,410 kilometers. It went through 11 sets of tires. The average speed was 225.23 km/h; it posted its fastest lap time of 3:21.981 during qualifying.

Why do all of this? Because we can, certainly. Because a handful of people believe in an idea, pursue a goal. And what is very important to Audi: Many of the developments that debut at Le Mans make their way sooner or later into production vehicles. Experience crucial for the modern engine technology used today in Audi-brand automobiles is gleaned at Le Mans. This year, innovative LED lighting technology will be used to illuminate the track during the race. Illumination brings us back to faith. Without faith in your ability to win, there is no point in entering at Le Mans. At Audi Sport, Dr. Ullrich is confident of having designed a car capable of winning in the R18. “We set ambitious goals for ourselves, and we now have a lot of testing work to do. If we are able to confirm these targets and also achieve them on the track at Le Mans, we will have taken a tremendous step forward with this car.” Sounds as if the R18 is a winner. Have faith. ●

TIM GUTKE

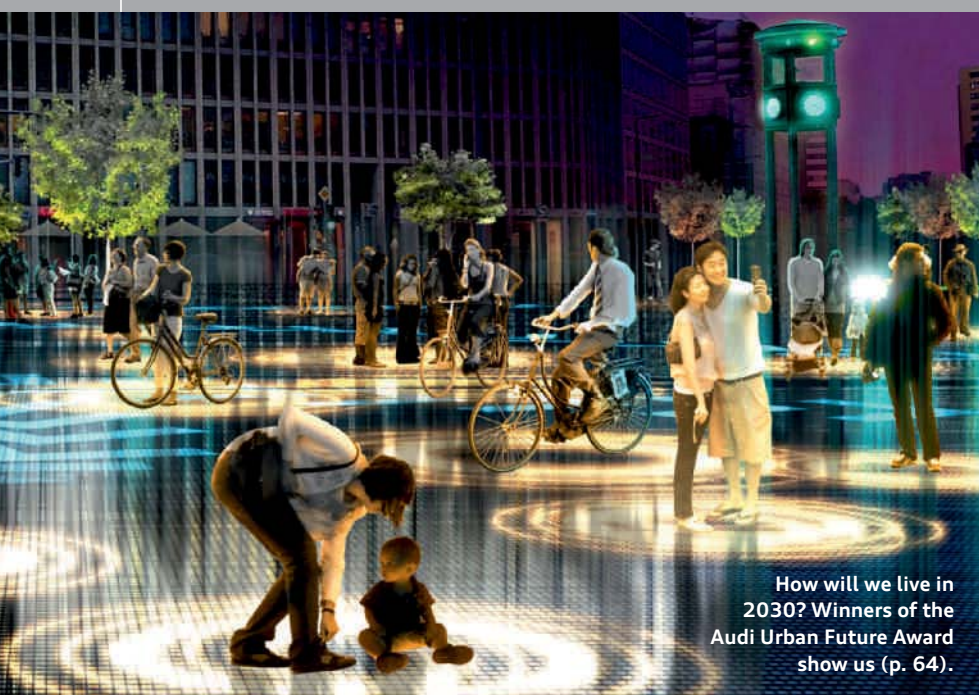


Experience the premiere of the R18 at:
www.audi.com/ar2010/lemans

Entering a new world of mobility



Electric car and supercar in one: Stig Blomqvist tests the e-tron Silhouette (p. 82).



How will we live in 2030? Winners of the Audi Urban Future Award show us (p. 64).

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Five architecture firms consider the future of the cities.
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Audi USA benefits from the Americans' new eco-awareness.

WELCOME FRANK

MODE: REAL

Architecture competition

Vision 2030

The Audi Urban Future Award honors visionary urban planning concepts that focus on mobility in urban spaces. It began in 2010, with five architecture firms from all over the world considering the future of the cities.

PHOTO | J. MAYER H. ARCHITECTS

ESTATE

STATUS: BUSY



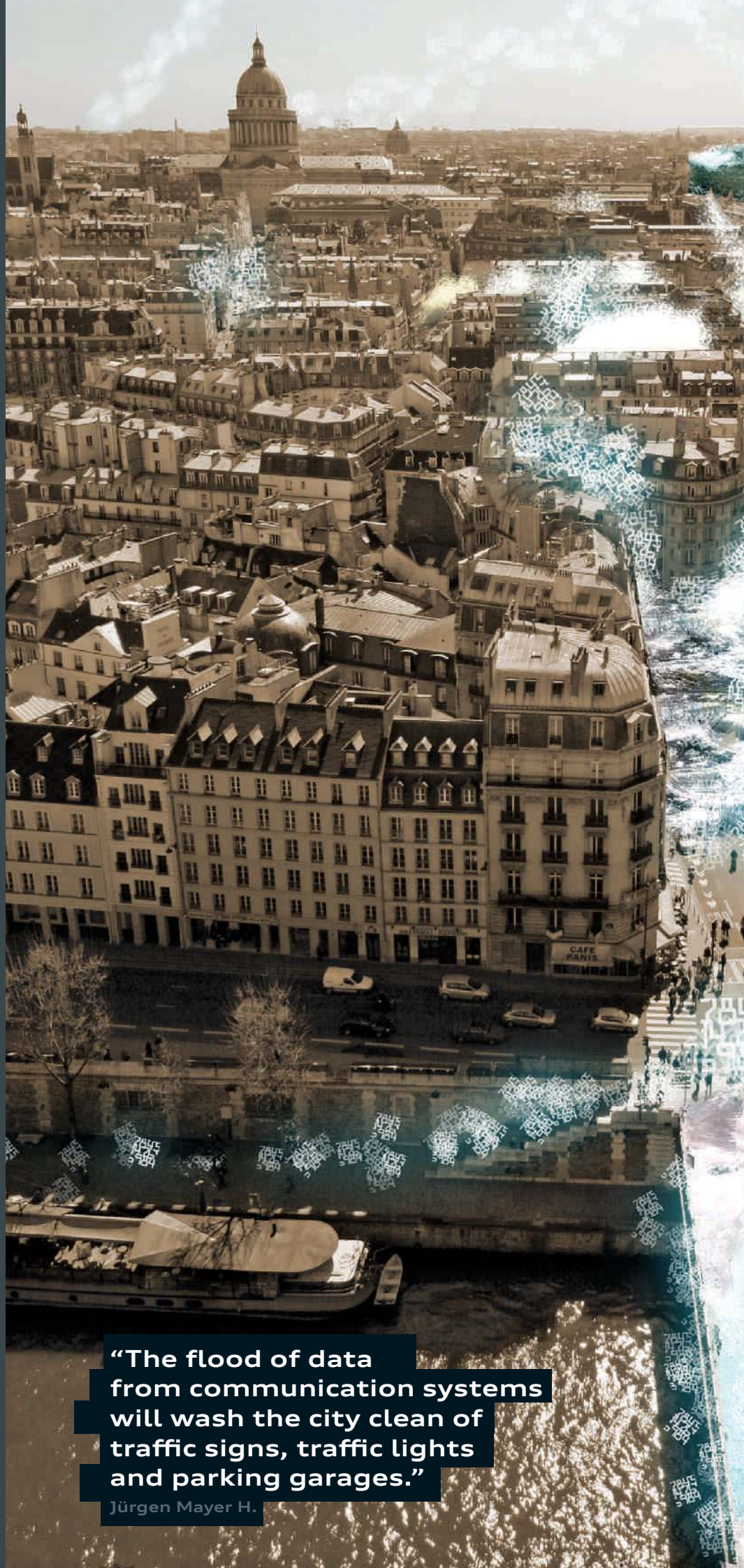
The windscreen is transformed into a touchscreen; people and buildings are constantly exchanging data – this is how Jürgen Mayer H. envisions the digital city of the future.



Jürgen Mayer H. Winner of the Audi Urban Future Award 2010

Architect and designer Jürgen Mayer H., born in 1965, places the first letter of his middle name, Hermann, as an initial after his last name. But his name is not the only unique thing about him – his designs are just as distinctive. Mayer H. works in the zone where architecture meets art, where technology meets design. He has designed temperature-sensitive lounge chairs (Heat Seat, 2001) and soft seating with glass mosaic tiles (Soft Mosaic Collection, 2008). One of his best-known architectural designs is the Mensa Moltke in Karlsruhe. In Seville, the Metropol Parasol he designed is currently being built – a roof construction for a public square in the center of the city.

Jürgen Mayer H. studied architecture in Stuttgart, New York and Princeton. He founded his studio in Berlin in 1996. Since then he has been honored on multiple occasions for his designs. He has been selected, for instance, for the Mies van der Rohe Award's Emerging Architect Special Mention (2003) and the bronze Holcim Award Europe (2005) for sustainable architecture.



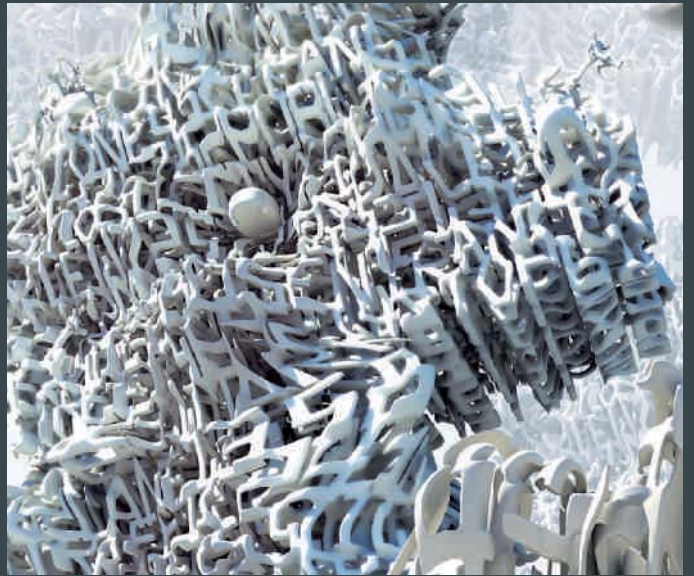
**“The flood of data
from communication systems
will wash the city clean of
traffic signs, traffic lights
and parking garages.”**

Jürgen Mayer H.

In Jürgen Mayer H.'s vision of the future, the digital age floods the city.



PHOTOS | J. MAYER H. ARCHITECTS (4); AUDI AG



Free of traffic lights and signs is how Jürgen Mayer H. envisions the city of the future (above); he calls his virtual metropolis "Pokeville" (center).



Audi Board of Management Chairman Rupert Stadler (right) presents Jürgen Mayer H. with the 100,000 euro architecture prize at the venerable Scuola Grande di Santa Maria della Misericordia in Venice.



Alison Brooks
AB Architects,
London

The native Canadian founded her office in London in 1996 after having worked at Ron Arad Associates. Alison Brooks builds hotels, apartment houses, public buildings and urban development projects. She teaches Urban Design & Housing at London's Architectural Association. One of her most famous buildings is the Quarterhouse cultural center in Folkestone.

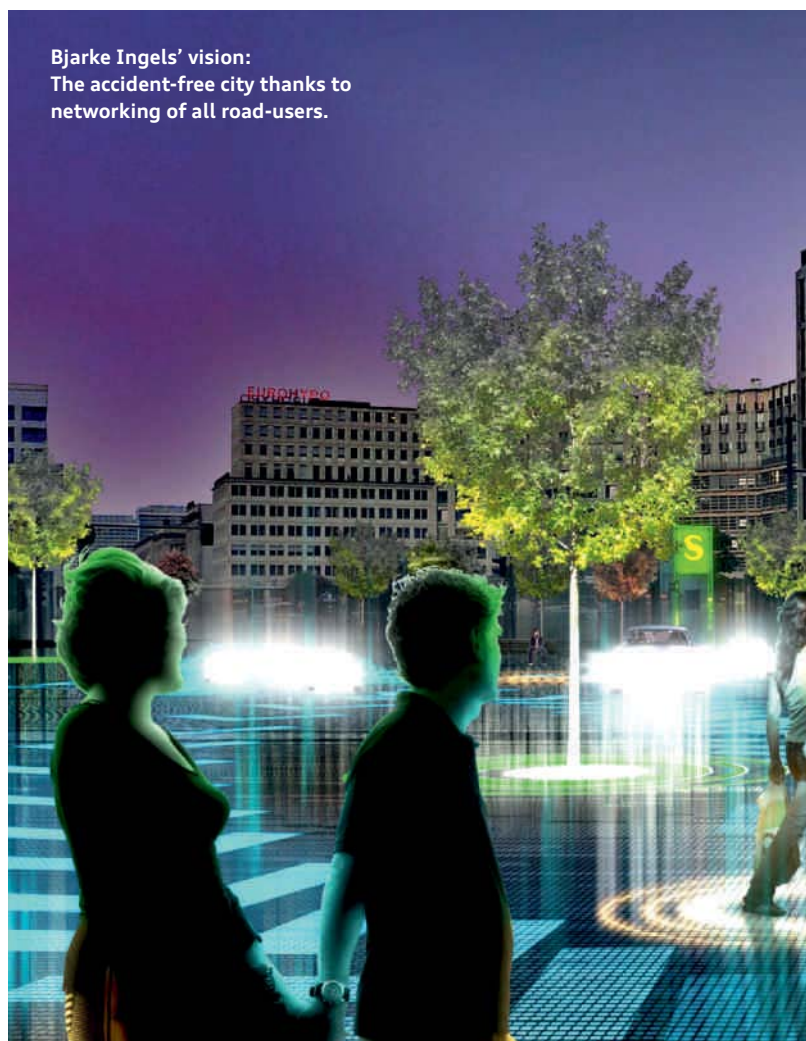


On August 25, 2010, AUDI AG presented the first Audi Urban Future Award in Venice – with a 100,000 euro endowment, this is the most lucrative German architecture prize.

It will be awarded every second year. The Scuola Grande di Santa Maria della Misericordia, a Venetian palace dating back to the 16th century, provided a festive backdrop for the award ceremony. In the palace's large ballroom, five international teams of architects presented their visions of megacities with over ten million inhabitants in the year 2030. Pragmatic carmaker and architectural utopias – two very different worlds. At least that's what you might think. But as a maker of premium cars, Audi has good reason to concern itself with the future of megacities.

More than half of the world's population already lives in cities. By 2050 it could be three-quarters of all humanity. While the former metropolis of Venice has been shrinking for many years, more and more urban centers containing over ten million inhabitants are developing all over the world. In 2015, there will be an estimated 26 megacities. Populations and traffic volumes are growing at a particularly rapid pace in China and India. One example is Mumbai, which had 20 million residents in the past year, and according to a forecast by the United Nations will grow to almost 26 million residents by 2025. Cars already creep through the city at a snail's pace during rush hour. And the demand of the growing middle class for individual mobility

Bjarke Ingels' vision:
 The accident-free city thanks to
 networking of all road-users.





Electric cars, bicycles and public transport – for Alison Brooks, the right mix for the future.

continues to increase. Today around 14 million Indians own a car. While two million cars were sold in 2010, this number is expected to grow to more than three million in 2014.

“Because of these developments we are faced with a completely new challenge where sustainable individual mobility is concerned,” says Rupert Stadler, Chairman of the Board of Management of AUDI AG, in explaining the decision to present the Audi Urban Future Award. How we will live in the next generation of megacities, how we can design the living spaces despite the enormous population density, what priority the private car will take on and how traffic routes and types of drive systems might change – all of these subjects presented a challenge to those participating in the competition. “The architects succeeded in explaining the relationships between mobile and immobile stakeholders in the complex urban system, while keeping the concepts rooted in reality,” said sociologist Saskia Sassen, chairwoman of the jury. Therefore, London architecture firm AB Architects developed a concept that could reduce traffic density in heavily populated megacities – by decentralizing the routes, with flexible and compact electric cars and through web-supported car sharing systems.

Promoting dialog between the company and the architects was important to both Audi and Stylepark – the curators of the competition. The architects were consistently assisted and supported by the Audi Think Tank, which comprises experts from various departments of the company. During one visit to corporate headquarters the



Bjarke Ingels BIG – Bjarke Ingels Group

The native of Denmark, born in 1974, studied architecture at the Royal Academy in Copenhagen and the Escuela Técnica de Arquitectura in Barcelona. Before he founded the BIG – Bjarke Ingels Group in 2005, Ingels worked for the Dutch shooting star Rem Koolhaas of the Office for Metropolitan Architecture (OMA); today Ingels is a rising star himself. He built the Danish pavilion for Expo 2010 and designed the spectacular REN People’s Building in Shanghai. Bjarke Ingels has already been honored with one Golden Lion by the Venice Architecture Biennale (2004) and with the World Architecture Festival Award (2008).

Zhang Ke Standard- architecture

Chinese architect Zhang Ke studied urban design at Tsinghua University in Beijing and architecture at Harvard University. After learning his trade in architecture firms in New York, he founded Standard-architecture in 1999 and moved to Beijing, where he is now among the most sought-after architects. His most prominent building projects include the Yarlung Tsangpo shipping pier in Tibet and the Qingcheng Mountain Teahouse in Chengdu. The 160-meter high “Dancing Books” towers in Wuhan are in the planning stages.

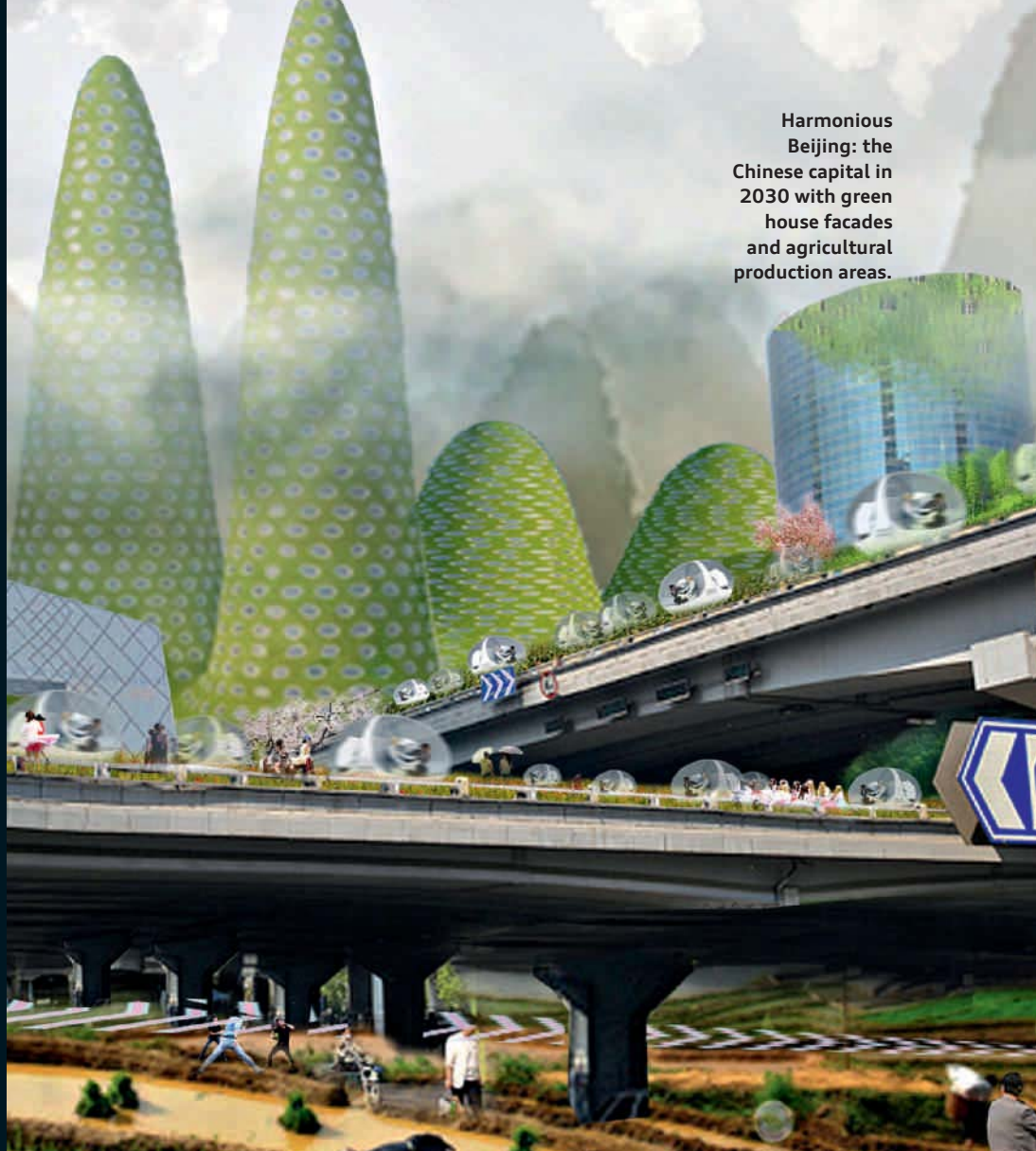


architects were offered insight into the car manufacturer’s development efforts. They discovered that the future of automotive technology is already within grasp today in Ingolstadt. The fusion of the world of vehicles and the Internet, driver assistance systems, electric mobility, car-2-car and car-2-x communication – that is, dialog between the car and its infrastructure – all of these technological trends were vigorously discussed and found their way into the architects’ concepts.

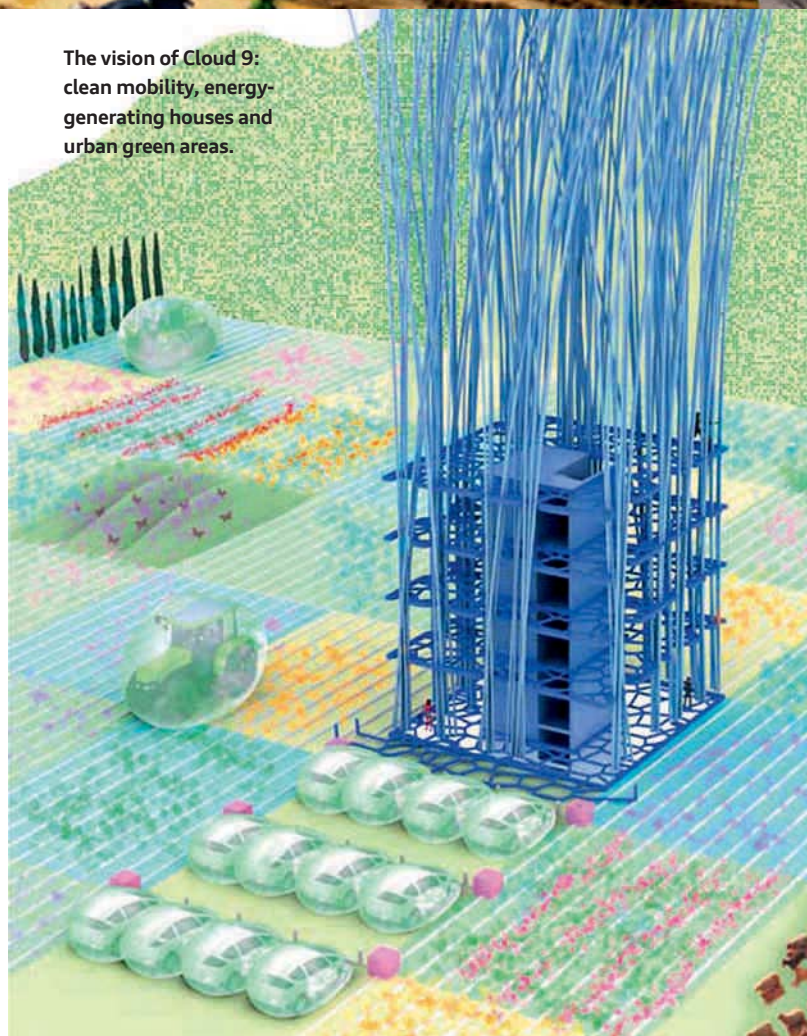
Competition winner Jürgen Mayer H. conceived the vision of a driverless car that is constantly in computer-guided motion, while passengers use the car as a retreat and a place to communicate. The windshield – no longer needed as a window in the driverless car – functions as a display screen upon which the reality from a personalized world of social media is superimposed. And the city? Since there is no longer any need for traffic signs, lights and parking bays, there is more internal room for the city to grow. New open areas are created.

The Copenhagen architecture firm BIG – Bjarke Ingels Group also presented a concept that centered around a driverless car. More intelligent vehicles and networks may shape the city of the future more distinctly than new construction materials or architectural styles. “Automated traffic flows could even allow new forms of urban life to

Harmonious
Beijing: the
Chinese capital in
2030 with green
house facades
and agricultural
production areas.



The vision of Cloud 9:
clean mobility, energy-
generating houses and
urban green areas.



The jury Thinking for tomorrow

Saskia Sassen, sociologist,
New York

Fernando de Mello Franco,
architect, São Paulo

Rahul Mehrotra, architect,
Mumbai, Cambridge

Andres Lepik, MoMA, New York

Christian Gärtner,
curator, Frankfurt am Main

Dr. Werner Widuckel,
former Member of the Board
of Management for Human
Resources, AUDI AG, Ingolstadt,
jury member

Rupert Stadler, Chairman of
the Board of Management
of AUDI AG, Ingolstadt

Stefan Sielaff, Head of Audi
Design, Ingolstadt

Jun Ma, Professor of Automotive
Technology, Shanghai

Wolfgang Egger, Head of Design
for the Audi Group, Ingolstadt

Participants, clockwise
from top right



The international jury discusses the concepts: The winner of the first Audi Urban Future Award is Jürgen Mayer H. from Berlin.

Enric Ruiz-Geli Cloud 9

The Catalan architect studied at the *Escuela Técnica de Arquitectura* in Barcelona and founded his firm, **Cloud 9**, in 1997 in this Spanish city. He is considered a specialist in sustainable architecture. With his innovative facade facings, using such materials as high-tech plastics or ceramics, he creates self-sufficient residential buildings and public structures that generate all of the energy they need. These are visions that find a receptive audience. Ruiz-Geli has received honors including the Research and Development Award of the Southern California Institute of Architecture (2008) and the Catalan Premis Medi Ambient for Sustainable Architecture (2009).



arise," predicted Bjarke Ingels. "As soon as cars begin moving in harmony with each other, the car traffic becomes four times as compact."

Catalan architect Enric Ruiz-Geli presented his visions of an empathetic relationship between mobility, the environment and architecture in the form of urban scenarios – a concept in which every aspect of the city gets by without producing CO₂ emissions and in which homes provide a renewable energy source for urban mobility.

The Standardarchitecture architectural firm presented the "Harmonious Beijing" vision, in which residential towers with green facades are directly connected with subway rings. Downtown traffic is kept constantly flowing with electric-powered travel belts, upon which self-powered electric cars – "travel belt bubbles" – are brought to their destinations, along with bicycles, pedestrians and other transport users. Today this might seem as utopic as science fiction, but Zhang Ke, founder of Standardarchitecture, reminds us that 200 million Chinese have been urbanized in the last ten years, and that another roughly 400 million will be added to that in the next decade. City planning in China works on a different time scale than in Europe. ●

DOROTHEA SUNDERGELD



Take a look at the highlights of the first Audi Urban Future Award here: www.audi.com/ar2010/aufa



Renewable energies

A ray of light in Solar Valley

The major cities of this world all face the same challenge – rising CO₂ emissions. The Chinese city of Dezhou is pointing the way to overcoming the problem: Municipal authorities and industry are relying on solar energy to power their way out of the climate dilemma. And Audi is also using the power of the sun. For cars, production and a sustainable approach. Time to swap insights across two continents.

Each night, the
Micro-E Hotel in
Dezhou lights up
using the stored
power of the sun.



Wu Cuiyun has a dream. She is fighting to make sure that strong economic growth and sustainability are no longer mutually exclusive and is herself providing a prime example of the silent green revolution. Rupert Stadler is also driven by a vision: of the low-emission corporation that is both ecological and economical. Stadler is Chairman of the Board of Management of AUDI AG, Wu Cuiyun is Mayor of Dezhou, the Chinese solar city. Two worlds, many ideas, an exchange of opinions.

“Welcome to China’s Solar Valley,” a sign declares to travelers entering Dezhou. By day and at first sight it is just one of China’s many cities, but the sea of lights illuminating Dezhou at night is more reminiscent of dazzling

metropolises like Hong Kong or Las Vegas. With a decisive difference: the neon ads, street lamps and traffic lights in the city are all powered by the sun and thus from a renewable source.

All households in Dezhou already use solar collectors to gain their hot water.

For Wu Cuiyun it is more than just economics that counts: “Our grandchildren should also be able to hear the birds chirping and smell the fragrance of magnolia. And that is what we in Dezhou want to offer,” she says.

Rupert Stadler nods. In order to be able to realize the Chinese solar city’s objectives worldwide, too, he believes that it is imperative that we consistently change the way we think.

“Industry must also pave the way to an eco-friendly future. It must conserve limited resources, enable pioneering innovations and open up to renewable energies.” Stadler knows what he is talking about as the brand with the four rings is also, among other things, banking on solar power.

While in Dezhou millions of lights sparkle at night, at Audi in Ingolstadt there are no neon ads and no dazzling lights, because here the sun is being used to fuel cars. In future, Audi’s electric e-tron models will be powered up in the plant with electricity generated directly from the photovoltaic panels on the plant roofs. “Only if electric cars are fueled with green power will they really be a sustainable means of transport,” Stadler states. “We need a holistic approach if we are to be more climate-friendly in the long term,” Wu Cuiyun agrees.

Today, all homes in Dezhou source their hot water from solar collectors. No new building is approved without it having solar panels on the roof, and the windows have to be outfitted with energy-saving double glazing to prevent any unnecessary loss of heat. In China, even in 2011, this is definitely not yet the norm.

Wu Cuiyun hopes that in the future companies will shoulder more responsibility themselves, but she still discerns the need for political action. For this reason, Dezhou-based corporations that wish to switch over to a renewable energy source receive a state subsidy of up to 20 percent of their upfront investment. Companies that develop and manufacture solar products get favorable credit terms and in some cases are even exempted from paying land leases.

“Being climate-friendly must not be restricted to solar products or electric cars,” Wu Cuiyun says. “Which is why for Audi it is our entire energy balance sheet that matters,” Stadler adds. For example, at the Audi paint shop in Ingolstadt, more than 7,000 tons of CO₂ are saved each year thanks to a heat recovery system. Furthermore, the public utility Stadtwerke Ingolstadt uses a new district heating system to provide Audi with excess heat from a refinery and a waste incineration plant.



Rupert Stadler, Chairman of the Board of Management of AUDI AG, sees great potential in the use of solar energy (above). Roofs with solar modules shape the face of the Chinese city of Dezhou (right).





The Solar Queen

Mayor Wu Cuiyun dreams of a future where she hears more birds chirping. Thanks to solar power.

This knocks an additional figure of some 26,000 tons off the annual CO₂ emissions total.

In Dezhou, companies that have high CO₂ emission levels and do not switch over to climate-friendly energy are not allowed to locate to Solar Valley in the first place. And precisely for this reason the city is growing rapidly. Because of the boom in the solar industry a lot of people moved to Dezhou, which led to its population rising from the 1980s by more than a million to 5.5 million.

Wu Cuiyun believes urbanization marks an opportunity to advance many new developments. At the same time, she has to respond to the dramatic increase in traffic that the city's growth has brought with it. "I expect that the automobile industry will play its part in shaping future mobility, for example in the form of new drive systems or space-saving city cars," she says. Stadler is keenly aware of the responsibility involved: "Audi is prepared for the challenges of tomorrow." The decision to take the A1 Mega City Vehicle to market in China was itself already a response to the urbanization trend.

"We have solutions for the widest range of different mobility requirements, and that includes for Dezhou. The major trend continues to be electric mobility," says the Chairman of AUDI AG. Urban electric cars in big Chinese cities need not necessarily be four-seaters, and the lower speeds driven in cities mean the car requires less aerodynamic adjustment and can even get by without an engine hood. This would leave more space on the

streets of Dezhou. "That would be an important step in the right direction in terms of both environmental policy and infrastructure," Wu Cuiyun notes. While Stadler fully prioritizes individual mobility, the mayor also believes there are prospects for public transport. For example, the Chinese government is already building a new high-speed rail link between Dezhou and Beijing that will cover the distance of more than 300 kilometers in less than an hour. A new interstate connecting the Solar Valley to the Chinese capital has already opened. "Now all that we need are recharger stations powered by solar energy," comments Stadler.

After all, both firmly agree that in China and in Germany alike the future of our cities will be defined by electric mobility and renewable energy sources. It is ultimately one and the same sun that allows reality and vision to shine forth in both countries. ●

CHRISTINE MAUKEL



Solar traffic lights – a customary sight for schoolchildren in Dezhou.



Click here to discover China's Solar Valley in Dezhou:
www.audi.com/ar2010/solar

A grand entrance in the Audi e-tron Spyder: Rupert Stadler (right) and Gary Shapiro, CEO of the Consumer Electronics Association, drive onto the stage together at the start of the International CES 2011.

Audi at the International CES 2011

Networked in Las Vegas

Audi presented the infotainment technologies of tomorrow at the Consumer Electronics Show (CES) in Las Vegas. The German carmaker's first appearance at this electronics trade show was entirely focused on the networked car.



The driver leans back comfortably in his seat and focuses his full attention on the 3D display screens. His car glides independently to its destination at high speed, safely guided by the on-board electronics. In this key scene from the science fiction thriller "I, Robot," action star Will Smith shares his starring role with a futuristic vehicle bearing Audi's four-ring logo.

Hollywood's visions of the future are often quickly overtaken by reality. This is demonstrated with particular clarity at the International CES, the Consumer Electronics Show in Las Vegas. At the show, electronics manufacturers sketch out the possibilities and demonstrate the trends of tomorrow. Audi was represented this year for the first time in the gambling capital – and Chairman Rupert Stadler was given the honor of opening the show with a keynote speech.

With thundering music and blinding headlights, a car rolls onto the stage as the mesmerized audience looks on. Low-slung, red and dangerously attractive. Rupert Stadler has brought along the latest concept car from Audi – the e-tron Spyder. And James Cromwell, one of the stars of "I, Robot." With them, Stadler elicits the right associations. Autonomous vehicle control and the networked car – both seem within reach.

But wait just a minute. First of all, what is a major carmaker actually

doing at the biggest trade show for entertainment electronics? Stadler explains: "The car of the future will be networked – with its surroundings, with the traffic infrastructure and with the world of the Internet." This is precisely where Audi wants to develop its strong position. Today, the motto "Vorsprung durch Technik" also relates to the digital world.

The premium carmaker sees cars of the future as being integrated into the mobile data network. Some Audi models already use Google navigation and are a WLAN hotspot on wheels. "The car as a status symbol now networks with mobile status symbols – smartphones and navigation devices," Stadler says with confidence. In the future Audi models will be linked even more intensively with the Internet, with other cars and with the traffic infrastructure via fast data networks like UMTS, and soon also via LTE.

Audi is placing the focus on simple operation of the equipment. Controlling the user interface – the Multi Media Interface (MMI) – will be as intuitive as possible. This will be achieved, for instance, with voice-based online searching for restaurants and other points of interest.

The innovation cycles are getting shorter and shorter – and this also applies to the automotive industry. Electronics are setting the pace. Audi has more than 100 years of experience in mechanical engineering;



Keynote speech

Rupert Stadler showed how the automobile, electronics and lifestyles are growing together.

now the carmaker is consolidating its expertise in the area of software development. Through its partners, Audi is bringing outstanding technologies on board and is making them usable for the automotive world.

The joint venture e.solutions GmbH is developing customized software for this purpose. For several years Audi has relied on the California-based graphics specialists at NVIDIA for its infotainment modules. Audi will soon be one of the world's first carmakers to employ their Tegra 2 processor, enabling elegant and highly dynamic graphics.

The car will also be a part of tomorrow's world of data. Will all this someday make the driver obsolete? The hero in the futuristic thriller "I, Robot" gave a very clear response to this question: When his futuristic Audi was being held in the grasp of a hostile machine, he took control of the steering wheel himself. After all, as Audi boss Rupert Stadler said in Las Vegas: "At Audi, we love driving." •

WOLFGANG KOSER



Vorsprung durch Technik in digital form

Together with Jen-Hsun Huang, CEO of graphics processing unit inventor NVIDIA, Rupert Stadler presents a new platform (left). Hollywood star James Cromwell (top) discusses the filming of "I, Robot."



A star architect on the go

Pure pleasure

A summit of extraordinary proportions: Meinhard von Gerkan meets the Audi A8 L – and experiences impressive technology in the lap of luxury.

A premiere in Switzerland. The first rendezvous between the architect and the automobile. The passenger immediately makes out the sedan at Zurich airport – no need to point it out. The brilliant black Audi A8 L*, which is 5.27 meters in length, speaks a supreme, dynamic, distinctive language. Absolutely unmistakable.

It all starts with an easy entry. The automatic power assist closes the

large rear door, as if by magic. Gently. Very gently, very quietly. A dialog begins. It takes place at eye level. The participants are the Audi A8 L, with chauffeur Peter Rensen at the wheel, and his passenger, Professor Meinhard von Gerkan, in the rear.

Peter Rensen starts the 12-cylinder engine, activates the turn signal and filters into the flow of traffic. The 8-speed tiptronic transmission shifts as smooth as silk; there's hardly a sound to be heard.

Professor von Gerkan is co-founder of gmp (Gerkan, Marg and Partners), a multiple award-winning architectural firm with operations around the globe. At the pinnacle of the firm's portfolio of finished projects and projects currently under way is the complete blueprint of Lingang New City near Shanghai, an urban center designed from the ground up for no less than 800,000 people. It also includes just about anything that could possibly be creatively conceived



Lavish and lovely: The interior of the A8 L offers not only plenty of room, fine grain ash wood and Valcona leather, but also the Rear Seat Entertainment system.

from steel and glass, stone and concrete – everything from museums to theaters, train stations to airports, hotels to stadiums. Berlin Central Station, the Hamburg, Stuttgart and Berlin-Tegel airports, the modernized Berlin Olympic Stadium, the New Trade Fair Leipzig, China's National Museum in Beijing and the Maritime Museum Lingang City – all examples of outstanding architecture.

The Audi A8 L* is of comparable caliber. A masterpiece, an attestation

to the art of progress. Travel in comfort, work with a focus, savor the moments of relaxation – Meinhard von Gerkan values this trio of principles. For him, ample space is a luxury in our day, especially in a car. The professor does have a rather imposing appearance, after all. At 1.89 meters, one has a heightened awareness of spatial dimensions, which is seldom the subject of absolute praise. In this case however, the praise comes unqualified: "Exemplary."

Can an additional 130 millimeters in length really mean that much? Meinhard von Gerkan seems surprised. From the outside, he says, the Audi A8 L conveys "a certain understatement. It's not a flashy car; rather it keeps its obvious qualities elegantly concealed. And I like that."

Meinhard von Gerkan sits in the back and takes a look around the tasteful interior with its fine materials. Brushed, gleaming silver aluminum, velvety brown fine grain ash, smooth

Valcona leather. Silk beige is the color of the seats; the headliner is alabaster white. Harmony and brilliance of style, of form. Such menial words as “narrow,” “low” and “small” have no place here. Instead, it’s space as space should be – large, lavish, lovely. The car offers up a ride seemingly on air.

The professor appreciates the comfort and shows an interest in the technical details.

The executive seat at the rear of the Audi A8 L* underscores this feeling of luxury. Experience, perceive, be attentive. Meinhard von Gerkan savors it with all his senses. Close your eyes and lean back – legs stretched out, feet on the extended footrest on the back of the front passenger seat – doesn’t that feel cozy?

The individually controlled footwell and seat heaters just add to the feeling. There are more than enough ways to adjust the electronic seats – from seat inclination to backrest inclination to lumbar support. But the highlight has to be the massage function. From the four available options, Professor von Gerkan first chooses “Wave,” then “Pulse,”

and finally – for good measure – “Stretch” and “Lumbar.” Does it feel good? “Why yes, it’s very, very pleasant,” responds von Gerkan, who defines the ultimate in traveling comfort as follows: “A car with a chauffeur on roads with as little traffic as possible.”

Today is just such a day. Seamlessly, traffic flows on the highway from Zurich northward. The driver and the passenger converse without ever having to raise their voices. Communication the way Meinhard von Gerkan likes it. He is interested in the driver-assistance, information and safety systems in the Audi A8 L, “because I like to sit behind the wheel myself.”

He wants to know more about the technical innovations that make the A8 L so special. Peter Rensen is only too happy to oblige. Without diverting his attentive gaze from the road, he provides an in-depth explanation of the adaptive cruise control with stop&go function he has just activated. It is the centerpiece of the Audi pre sense plus driver assistance system, which can make use of radar sensors and a video camera to maintain a selected speed within the system limits on an open stretch of road, and also keep a set



Chauffeur Peter Rensen drives the A8 L. The 8-speed tiptronic transmission changes gear smoothly. There’s barely a sound to be heard.

“The A8 is not a flash car. And that’s what I like about it.”

Professor Meinhard von Gerkan

A good match: the famous architect Meinhard von Gerkan and the A8 L.



distance to the vehicle ahead. Within certain limits it automatically brakes and accelerates in slow-moving traffic and in traffic jams. It detects suddenly occurring obstacles and alerts the driver with a uniquely identifiable audible signal.

And the list of noteworthy features goes on: night vision assistant. Park assistance. The light show in the interior with its polar, ivory or ruby/polar realms of color. Without a doubt the all-LED headlights, which automatically more than double the light cone's range at speeds over 110 kilometers per hour. And the quattro permanent all-wheel drive system.

But Rensen wraps up his little presentation with a brief explanation of Audi side assist. When he drives, this complex system is always on. If the system determines that an imminent lane change could result in an accident, it warns the driver by displaying a light signal in the outside mirror. "Either because a car traveling at a faster speed is coming up from behind in the passing lane or because there is a car in the blind spot."

Professor von Gerkan is impressed. He says with a laugh: "What a wealth of totally new impressions." And asks: "Does that change the way you drive?" His driver's response: "These systems are not a substitute for concentration and attentiveness, or for the talent and skill of the driver, that's for sure. That's why they call it driver assistance."

The architect's philosophy: "The mind and the hands guide creativity."

Peter Rensen drives nearly 80,000 kilometers every year. He has a chauffeur license and regularly attends driving and safety training courses. In terms of his profession, Meinhard von Gerkan is also a "perpetual student." He has to stay on top of the very latest methods in civil engineering and architecture, he says, "even if I need nothing more than a pencil and a piece of white paper for sketches of ideas and initial drafts."

It's all a question of philosophy. "My mind and my hands," says the star

architect emphatically, "are what guide my creativity." An important statement, and one that pertains equally to the latest-generation Multi Media Interface (MMI) from Audi. Its operation is easy, logical and intuitive. Everything – telephone, navigation, radio or other media such as DVD or iPod – is self-explanatory and ready to use in no time. It makes work easy. And a pleasure, too.

The Bang & Olufsen Advanced Sound System turns the A8 L into a festive concert hall.

Meinhard von Gerkan does not conceal his approval; as it happens, his own philosophy, expressed in two basic principles, falls precisely in line with the value system embodied in Audi's top-of-the-line model. One principle states: "Give structural order to concepts. Arrange functions in clear structural

shapes." And the other: "Create unity in diversity. Create diversity in unity."

How is happiness expressed? In music. Beethoven's violin concerto, played by Anne-Sophie Mutter. The surround-sound reproduction with 19 speakers in the Bang & Olufsen Advanced Sound System transforms the exquisitely styled interior of the A8 L* into a festive concert hall. Meinhard von Gerkan leans back and looks up through the panoramic glass roof into the Swiss sky. No need to ask, it's quite obvious: The journey in the Audi A8 L has met his expectations in every regard – engine and safety, smooth ride, spaciousness and sound experience. In sum: first-class traveling pleasure. ●

HANS BORCHERT



Discover the new Audi A8 L at:
www.audi.com/ar2010/a8



**Work with a focus,
savor the moments
of relaxation:
For star architect
Meinhard von
Gerkan, the A8 L is
a first-class travel
experience. There's
a wide range of
seat and backrest
settings. The
massage function
is the absolute
highlight.**



Test drive in the snow

Stig's special trick

It was cold – as cold as it was on the Night of the Long Knives during the 1984 Monte Carlo Rally. But in 2010, Stig Blomqvist was not fighting for the world championship. This time the racing legend was driving the Audi e-tron Silhouette with four electric motors.



The question is written all over his face – but Blomqvist doesn't ask it. Instead, his eyes wander around the car's interior. The 64-year-old reaches for his reading glasses on the center console. He puts them on and his eyes continue to wander. Blomqvist is looking for any sign of whether the car is ready to go. There, on the dial to the left behind the steering wheel – didn't that indicator just move? It did,

didn't it? Blomqvist takes his glasses off again.

Small wonder that Blomqvist the racing driver first needs to get his bearings. When he stepped on the gas of the original quattro a good quarter of a century ago, the turbo would scream. The racing car driven by the Swede at that time, with 360 hp and 450 Nm, roared powerfully into the woodlands along the tracks of the rally. Things are different in 2010. Although

the e-tron Silhouette on the Audi testing grounds near Munich Airport is ready to go, not a sound can be heard. No rumbling. No hissing. Nothing indicates that the four electric motors on the wheels are waiting to apply their total of 600 Nm of torque as propulsive power – and to do so starting from zero revs. "That's unsettling," grumbles the Scandinavian. "That noise – that unbelievably brutal sound – was what people liked so much."

Anticipation

Rally legend Stig Blomqvist looks forward to experiencing the power of the four electric motors.



Stig Blomqvist

was born in 1946 in Örebro, Sweden. In 1984 he became World Rally Champion in an Audi quattro, and was runner-up the following year. He participated in 84 world championship races in all, and he still races rallies occasionally today. His 17-year-old son Tom Blomqvist is now active as a racing driver in the United Kingdom.



Stig Blomqvist rockets down the Audi test track in the Audi e-tron Silhouette. Fast, but without the usual engine noise.

And he liked it too, of course.

The approximately 300-meter test track is covered with a slurry of snow. Perfect conditions for the Swede, who is addressed in his home country as “Mäster Blomqvist” – which translates roughly as Lord Blomqvist. Slowly and deliberately, Blomqvist moves the automatic selector lever to D. He pauses to check his “butt instinct.” This is a term coined by a Formula One driver who once explained that the secret of fast racing drivers is that they can feel with their behinds how a car will react. The better the driver applies his sensors, the faster he will be on the track. Blomqvist slides back and forth, but in an electric car, his butt instinct apparently does him little good. At least not at first.

He releases the brake and gingerly applies the gas. The gas? Actually, that’s the wrong term. The right pedal doesn’t cause a gas mixture to start flowing – it pulls electricity from the roughly 470-kilogram lithium-ion batteries mounted behind the seats.

The documentation says the Audi e-tron Silhouette accelerates from zero to 100 km/h within 4.8 seconds. The burst of acceleration from 60 to 120 km/h is supposed to take just 4.1 seconds. That’s on a par with the performance of a high-performance supercar with a gasoline engine. Can that really be possible with batteries?

Blomqvist answers that question with his right foot. Immediately after he puts the car into motion, he’s pressed into the deep bucket seats,

which are designed for racing. All of his neck muscles tense. His feet want to press against the force of acceleration, and he moves to get a foothold on the floorboard.

The Audi e-tron Silhouette doesn’t accelerate, it rampages. Stig Blomqvist says: “Powerful, very powerful.”

After this start, acceleration will have to be redefined. Other sports cars have a launch control function that charges through all gears and sends the vehicle to the rev limiter in automatic mode. Compared to the “e-start” of the R8, this seems like a silky-smooth little push. The Audi e-tron Silhouette doesn’t accelerate, it storms and rampages like a hurricane.

Blomqvist describes it as “powerful, very powerful.”

Maybe behind that cool, Nordic exterior there’s a storm of emotion raging. Maybe Blomqvist is reminiscing about his spectacular drive along the Col de Turini in 1984 when he plowed through the narrow mountain passes in four-wheel drift and left other rally greats looking like beginners. It’s all possible – but there’s simply no sign of it. Instead, Blomqvist says simply: “The traction functions well. It handles differently than the original quattro. The car reacts precisely to commands.”

Blomqvist uses clinical language to describe a very special kind of technological prototype. The Audi e-tron Silhouette provides a hint

After this start, acceleration will have to be redefined: Blomqvist enjoys the benefits of electric quattro drive in the Audi e-tron Silhouette.



30

years of quattro

For over 30 years now, seven letters have represented a milestone in automotive engineering: quattro. Whether it's a permanent all-wheel drive system that is driven by a differential, or all-wheel drive with a Haldex or viscous clutch, the name quattro is an unmistakable trademark from Audi. It stands for propulsion on city streets as well as off-road, even in strong winds, on ice or in snow. One out of every three Audi cars now leaves the assembly line with the quattro badge.

"It's incredible how the technology has developed, so that you can have a driving experience that comes extremely close to that of driving the original quattro."

of what Audi will be striving for over the next decade, namely the lowest possible emissions. And that's fine, Blomqvist observes dryly: "Because of global warming, you just have to offer something new."

The e-tron Silhouette in which the Scandinavian is sitting is a prototype: its front and air intakes stem from racing, as do the air intake gills on the side panels. The back is also borrowed from the racing series. But the 1.90-meter width, the 4.43-meter length and mere 1.25-meter height of the supercar is the embodiment of the slogan Audi has used for the past four decades: Vorsprung durch Technik.

Vorsprung – leadership – is also highly appropriate here since the age of

electric mobility is just beginning and has yet to be defined, but the electric quattro has already taken the stage.

In simple terms, this means four liquid-cooled, asynchronous motors that deliver power to the front and rear axles at a ratio of 30:70. Since each wheel has its own motor, the power can be distributed at lightning speed, as demanded by a typical drive with Blomqvist at the wheel.

"More than thirty years ago, quattro and its all-wheel drive were very different from the usual drive concepts," reminisces the Swede. "It was like night and day, like comparing a bicycle to a car. You can't describe it ... you have to experience it."

Experiencing the difference is a

“thrilling experience” for the venerable rally legend. The difference, that is, between a combustion engine with quattro drive, which is controlled through the transmission and differential, and the electric quattro drive with four motors. “It’s incredible how the technology has developed, so that you can have a driving experience that comes extremely close to that of driving the original quattro,” he said.

Blomqvist jerks the steering wheel to the right and brakes with his left foot.

Blomqvist became famous not only as a rally driver, but also for braking with his left foot. In the early 1980s the Swede mastered like virtually no other driver the trick of braking with the left foot while simultaneously applying the gas with the right. This allowed him to maintain high revs and keep the engine’s output up, although he was braking. In addition to many victories, this special trick brought Blomqvist the World Rally Championship in 1984 and the runner-up title the following year.

Now he tries this trick out in the Audi e-tron Silvertta on the snow-covered test track in Munich. He’s too much of an old pro to not at least give it a shot. He jerks the steering wheel

to the right, brakes with his left foot and applies the accelerator with his right. Now the butt instinct informs the driver that the Audi e-tron Silvertta wants to break loose each millisecond. But it doesn’t. “It won’t work,” said Blomqvist. “The ESP can’t be switched off. Those spectacular drifts aren’t possible.”

Blomqvist stops at a charging station, climbs out of the Audi e-tron Silvertta and insists on plugging the electric cable himself into the plug behind the side window, with utmost care. “That will be the biggest adjustment,” he said, looking into the distance. “Filling up is just faster than charging up. But who knows what Audi will think of by the time electric cars start series production?”

After a 20-minute stop for electricity, Blomqvist wants to go at it again. Alone. In peace. Just the Audi e-tron Silvertta and him. On an open area and without limits. Blomqvist swings himself into the driver’s seat. Again he puts on the reading glasses, and again the searching look. Then snow swirls into the air.

The Audi races away, traveling down the track at high speed. But without the usual sound. ●



Watch Stig Blomqvist in the e-tron Silvertta at: www.audi.com/ar2010/silvertta



Torque vectoring Perfect torque

Torque is the most highly prized force in a car. It’s what moves us forward. The higher the value in Newton meters, the more powerfully the car can move at a specific number of revs.

Torque can also come into play at inopportune moments when we drive too quickly in a curve or a highway exit. In these cases, the path we are taking can quickly deviate from that which we should take. To keep that from happening, Audi drivers get help from both the electronic stabilization program (ESP) and from torque vectoring.

While ESP keeps the car on the right track while braking, torque vectoring takes the opposite approach: It distributes torque to each wheel electronically, thereby preventing wheel spin. Faster than a blink of the eye, power is distributed to the front and rear wheels via multi-plate clutches on the individual wheels, in such a way that the Audi stays on track. This is true both when actively applying the accelerator or when simply allowing the car to coast downhill.



Legendary racer:
Stig Blomqvist continues
to be an ambassador for
Audi quattro.

Four valves, low consumption:
the 2.0 TDI engine in the
Audi A3 TDI clean diesel, the
Green Car of the Year 2010.



Sales record: 2010
marked the first time that the Audi
brand delivered more than 100,000 vehicles
to customers in the United States.



Scenes from the Audi commercial advertizing the efficient TDI engine in 2010 during what is probably the most important sports event in the USA.



Audi in the USA

Green wave

The Audi brand's U.S. business is growing more strongly than ever before. The Ingolstadt carmaker is benefiting from a new environmental awareness, and also from spectacular TV commercials.



At the award ceremony: Johan de Nysschen (right), President of Audi of America, and Ron Cogan, founder of the Green Car Award.

In the TV commercial, no one eluded the environment police: not the supermarket customer who asked for a plastic bag; not the suburbanite who threw compost in the household trash; and certainly not the young people with their non-returnable bottles. They were all caught red-handed by the

Green Police. Only one person was not detained: the driver of an Audi A3 TDI clean diesel. Thanks to its good climate balance, it was the only vehicle waved through an eco-checkpoint set up by the green sheriffs.

This one-minute Audi commercial was broadcast in 2010 during what is probably the most important American football game in the world. More than 100 million Americans watched the championship game. The commercial was mentioned 1.5 billion times in the media. An unbelievable marketing success for Audi, but no surprise. The Ingolstadt-based carmaker has stepped up its brand advertising in the United States in the last two years, particularly for its fuel-efficient TDI diesel models. The result was a sales record: 2010 marked the first time that Audi delivered more than 100,000 vehicles there.

These successes have a lot to do with the U.S. Americans' new eco-awareness. It has since gripped the entire nation, and Audi is feeding into this in a major way with its fuel-efficient turbodiesel engines. The high point came in December 2009 when the A3 TDI clean diesel was honored as the 2010 Green Car of the Year. This prize is awarded each year to the car with the best eco-balance that still offers a high level of ride comfort. The jury traditionally comprises the chairpersons of a number of American environmental organizations and show business stars such as television host Jay Leno. The final decision came down to the A3 TDI clean diesel and four competitors, three of which were hybrid models. Although Audi was a first-time nominee, the jury quickly arrived at its decision. "The Audi A3 TDI clean diesel defines what the jury considers an environmental car to be,"

said Ron Cogan, founder of the Green Car Award. "With its low consumption and highway fuel economy of 5.6 liters per 100 kilometers (42 U.S. mpg), it has established a new standard in the premium segment."

Also impressing the jury: In contrast to the hybrid competitors, the A3 TDI clean diesel stood out with xenon headlights, LED lights, a leather interior and a satellite radio system that is very popular in the USA.

The heart of the winning car, the TDI powerplant, was described by the jury as "quiet, but aggressive." By "quiet," the jurors meant the smoothness of the 2.0-liter TDI engine. "Aggressive" refers to the 103 kW (140 hp) power output and 209 km/h top speed. Many do not expect such performance from the winner of the Green Car Award. But in the jurors' view, the A3 TDI clean diesel demonstrated that performance and efficiency are not mutually exclusive.

Word has apparently spread in America. According to the marketing

agencies, the Audi brand has never been so desirable. "Americans need an emotional bond to their car," explains Scott Keogh, Chief Marketing Officer of Audi of America. "They want a model that stands apart from the others both visually and technically." The A3 TDI clean diesel fulfills these requirements perfectly.

But a good, green car on its own is not enough. To establish the emotional bond described by Keogh, Audi booked the best advertising slots during major events. Says Sebastian Mackensen, Head of Sales for the Americas at AUDI AG, "If the USA is watching television, we want to be there."

Coverage of the U.S. presidential inauguration in January 2009 began with a different one-minute commercial on each of the major television networks. Their messages: Change, renewal, progressiveness. "We used a public event in a very targeted manner for our innovative communication," explains Mackensen. In another

television commercial, oil barrels roll through the city to the harbor and onto a freighter. Two Audi TDI models are standing on the dock. An off-camera voice comments: "1.5 million barrels of imported oil each day. If just a third of all Americans would drive a TDI, we could send it all back." And after a short pause: "Diesel is no longer a dirty word."

Kicking off the green marketing campaign by Audi in America were the Audi Mileage Marathon and several "Diesel Dinners," at which stars dined between TDI automobiles. According to marketing boss Keogh, "This positioned the Audi brand as very progressive, young and modern."

The Audi brand is continuing its product initiative in the USA this year with the new A8, A7 Sportback* and A6 models. ●

OLIVER RICHARDT



An audio version of this article is available at: www.audi.com/ar2010/greencar



Start in the Big Apple: The Audi Mileage Marathon led 23 TDI models to the Pacific in 2008.

New York, Chicago, Los Angeles – in 13 days

For a long time in America, diesel stood for loud trucks. The thought of driving a diesel car was unimaginable to many U.S. citizens. Many were not even aware that passenger cars could be powered by diesel engines.

The Audi Mileage Marathon cleared up these misconceptions. In 2008, 23 Audi TDI models drove from the East Coast to the West Coast in 13

days, covering more than 7,800 kilometers from New York to Los Angeles by way of Chicago, Dallas and Las Vegas. At the wheel were 184 drivers from the USA, Europe and Asia. Their mission: to publicize the diesel engine and Audi's TDI fleet. Making the trip were the Q7 3.0 TDI clean diesel, the Q5 3.0 TDI, the A4 3.0 TDI and the A3 2.0 TDI.*

The TDI engines demonstrated fuel consumption advantages of up to 40 percent versus the fleet average for the gasoline engines typically used in the USA. "We were able to convince people directly in front of their doorsteps," says Scott Keogh, Chief Marketing Officer at Audi of America, "and demonstrated that the TDI combines efficiency and sportiness."

My lifestyle, my Audi

The new A1, the perfect car for individualists – and not only in Barcelona (p. 90).



Stefan Sielaff, Wolfgang Egger and the car design of the future (p. 94).

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Agile and sporty: The Audi A1 is the next big thing in the small car class.

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Trend researcher Peter Wippermann asks about the future of car design.

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The showroom configurator allows everyone to design their own individual Audi.



Trend

Styled for the city

Agile, sporty and refined: The Audi A1 is the next big thing in the small car class. The perfect car for urbane trend-setters and individualists. And where can you meet up with them? In Barcelona, for instance.



Clever companion

To school, to the beach, or to the shops: The Audi A1 gets Daniela Cañeque (left) and her friend Blanca Canals (right) to their destination in style.



Wherever Daniela Cañeque parks her new car in Barcelona, someone always immediately stops, looks and asks. “What kind of car is that? Do you mind if I take a look?” The new car is none other than the Audi A1. They started selling in August 2010. It’s a unique and exciting car – a real head-turner.

The Audi A1 is the first premium car from the Audi brand in this segment. It combines high-quality materials and sleek design throughout its length totaling a mere 3.95 meters. A coupe-like roofline, clear lines and the optional roof arch in a contrasting color create a modern look. The Audi A1 is made to appeal to a much younger target group than the other models. “We want to use it to reach successful and technical-minded people between 30 and 40, among others,” said Sandra Göres, Head of A1 Product Marketing at AUDI AG. These are sophisticated trendsetters who see the car as a symbol of their personality. Sara Escriu is a television journalist and anchorwoman at a local TV station in

Barcelona. The 26-year-old works a lot, exercises every day, and on weekends she goes out or goes shopping. Her new car needed to fit her – and to be something special. Beautiful, sporty and unique.

At first she was interested in the Audi A3. “But it was a little too big for me,” she said. So she bought the compact A1 as soon as it came onto the market – in Misano Red. The color immediately catches the eye and it also closely resembles the color of her favorite soccer club, FC Barcelona. She also decided to go for the panorama glass roof and the media style package, including a radio system with a pop-up color screen, as well as the LED interior light package and the connectivity package with Audi music interface, Bluetooth interface and an SD card reader. It’s the perfect car for Sara.

The A1 stands for an active lifestyle, premium quality and individuality. It offers the customer a wide range of ways to personalize the design of the car according to his or her personal wishes. If desired, the seats or air vent sleeves can be ordered in colors like titanium gray or wasabi green. It’s a

dream come true for individualists and people who know what they want.

Marlene del Rey knew immediately that the A1 was the car for her the very first time she saw it. Actually, she had already decided in favor of another subcompact, but it couldn’t compete with the quality of the Audi. “The A1 won me over. The elegant design and the high-quality interior set it apart from many other cars of this size.”

She ordered her subcompact as an Ambition model, the sporty version, and in black, of course, to match her clothes. Now she just has to wrangle with her husband Andrés for the keys on weekends. He’s got an Audi TT Roadster* himself, but he doesn’t mind leaving it in the garage now and then. “I just have a lot of fun driving the A1. It’s so agile and its handling is very sporty: You can really zip around quickly in it,” says Andrés. A true Audi, after all – the Audi A1. ●

NELE JUSTUS

Experience the lifestyle of the Audi A1 at: www.audi.com/ar2010/a1



Daniela Cañeque

Student, 19 years old

“I’m really proud of my A1. It is my first car and I gave myself plenty of time when I was choosing. I went from one dealership to the next with my father and I looked at all of the cars and took test drives in them. In the end I simply liked the A1 the best. It’s safe and sexy. At the same time, Audi stands for good quality. I picked the Ambition with a 7-speed S tronic dual-clutch transmission and the navigation system plus with 3D graphics. And I couldn’t do without the Audi sound system. That gets turned up nice and loud when I’m on the go. Especially when ‘Alejandro’ by Lady Gaga is playing – that’s my favorite song.”





Sara Escriu
News anchor, 26 years old

"With me, everything has to happen quickly. I rush from one appointment to the next: first an interview, then a press conference, and after that it's straight to the studio. That's why I wanted a car that can get me everywhere fast, and one with which I wouldn't have to look long for a place to park. And that looks stylish to boot. Fuel consumption was an important aspect for me as well. The A1* is efficient and economical. And when I'm waiting at a traffic light, I really appreciate the start-stop system. As soon as the engine shuts off automatically when I'm at a standstill, I have the feeling I've done something good. For myself and for the environment."

Make space!

With the A1 she always finds a parking spot – even on Barcelona's biggest shopping street, the Passeig de Gràcia.



Marlene and Andrés del Rey

Business graduate, 41 years old, and engineer, 38 years old

"My husband Andrés has always driven an Audi. Every year he buys himself a new one. He's an electrical engineer; he programs robots and conveyor belts for the automotive industry – and he loves beautiful cars. Every year we drive together to the Geneva Motor Show. That's where I saw the A1 for

the first time. The design won me over immediately: modern, elegant and not too playful. It's also several classes higher than other cars its size in terms of quality. Back in Barcelona I immediately had myself put on the waiting list. It took six months – and was worth the wait."



Above the rooftops

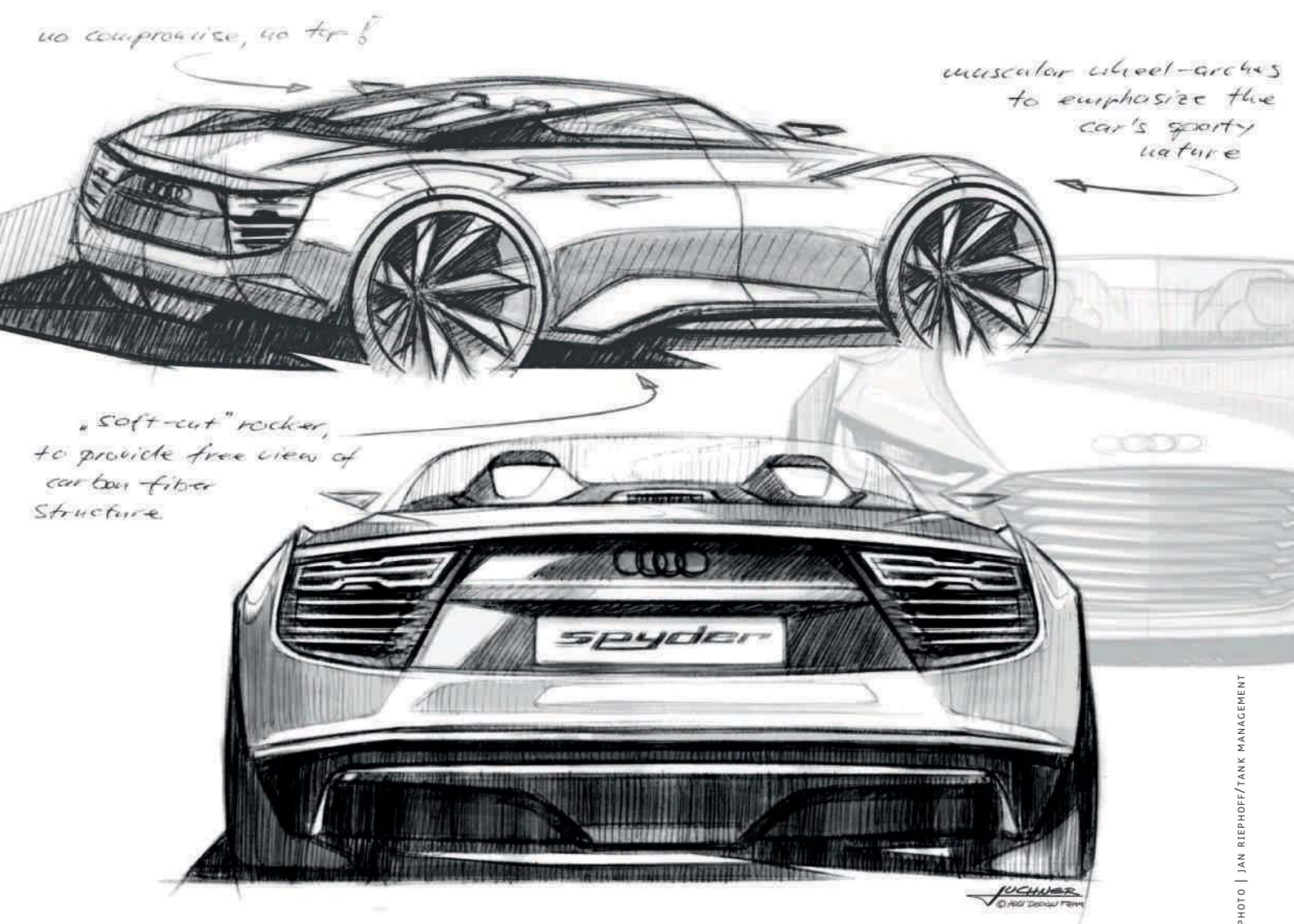
On weekends they drive to the mountains, to the sea or to where they had their first date – the Hotel Miramar, with one of the finest views over all of Barcelona.



Wolfgang Egger and Stefan Sielaff

“The engine compartment will be redundant”

Electric cars are revolutionizing car design, declare Wolfgang Egger, Head of Design for the Audi Group, and Stefan Sielaff, Head of Audi Design. One thing they are sure will survive is the steering wheel.



The future of the car: Nautical and aeronautical styling trends also influence the design of the e-tron Spyder.



“We’re using hybrid technology to bridge the gap to the electric vehicle. The question is how fast it will gain general acceptance.” Stefan Sielaff

Stefan Sielaff (left) and Wolfgang Egger (center) were interviewed in Munich by trend researcher Professor Peter Wippermann.

The car of tomorrow – what does it look like? Wolfgang Egger, Head of Design for the Audi Group, and Stefan Sielaff, Head of Audi Design, ask themselves this question every day – and answering it is becoming ever more difficult. Trend researcher Professor Peter Wippermann, based in Hamburg, tried anyway and interviewed the two chief designers about what kind of designs would become feasible with electric cars and whether the radiator grille and the steering wheel would become unnecessary.

Peter Wippermann: Is passion a prime requirement for good car design?

Wolfgang Egger: Passion drives us to

continually reinterpret the brand. At Audi, being innovative is a core value. **When you’re thinking about the car of the future, you are looking many years ahead. What motivates you in that process?**

Egger: One aspect is tradition. Audi has a DNA that defines the brand. These are unmistakable traits that have evolved over 100 years. The car’s architecture is typically Audi, and we also care what it looks like. Aluminum is traditionally an important material for us. The design must reflect that too.

To what extent do you take current trends into account?

Stefan Sielaff: What’s essential besides the brand DNA is how society is developing on a global scale. On

the one hand it’s important not to pursue passing trends. On the other, to keep one’s ear to the ground. We know for example that even today over half of the world’s population lives in megacities and that this tendency will continue to increase. That’s one parameter we take into account.

What are some of the others?

Sielaff: The question of how fast or slow we’ll drive in the future for instance will affect the aerodynamics, and consequently the design.

An increasingly important catchword in the cosmetics market is skin tonicity. Young skin is taut. Everyone wants to live long, without losing any of this tautness. How do you deal with this desire for youthfulness?

Egger: What we're seeing now is that in car design sharp edges and taut panels look smarter than curved ones. Such clean, taut surfaces seem fresher somehow. In my view this has also accentuated the Audi identity once again. This symbolic energy will be brought out even more in the next generation of our cars.

What is it that matters most in the design of the body on the one hand, and in the design of the interior on the other?

Sielaff: Exterior design is love at first sight. It has to make sparks fly. The interior brings out the relationship with the vehicle and with the brand. One might say it's the marriage after love at first sight. When you're talking about Audi, all the elements in the interior must have a functional rationale. A clear-cut purpose, if you will. And their operation should be intuitive whenever possible.

How will electric motors change the interior when certain features like the gearshift are no longer necessary?

Sielaff: Well, the first question is as follows: How can you tell in the electric car when the vehicle is ready to operate? After all, you don't get any acoustic feedback when you start an electric vehicle. The way we have

dealt with this now is by engineering a neat start-up scenario. In place of the gearshift we have a "drive regulator" that still has to be able at least to toggle forwards and backwards to shift between forward gear and reverse. As soon as the car is switched on, this control lever tilts up within easy reach – showing that it's ready to go.

Will there also be an acoustic mood-setter, like simulated engine noise? Something to remind you of "driving like we used to"?

Egger: There are some sensations we won't experience anymore in the electric car. We'll have to say good-bye to engine noise of the kind we are accustomed to.

Couldn't it just be a recording?

Sielaff: Technically that would be possible, but is it really credible? It's almost a philosophical question whether one should create such a sound effect, as it would not be authentic. In the electric car you will hear no noise only when it's standing still. But when you're driving, you'll hear tire noise on the road or a rippling noise in the wheel well. That's a different acoustic experience and creates a whole new emotional dimension.

What's it going to be like for pedestrians or cyclists? They would hardly hear a car approaching.

Egger: There will be light signals. But the pedestrian will have to get used to the fact that electric cars are very quiet. For this reason the sound technicians at Audi have taken on the task of protecting pedestrians also in times of electric mobility, for example by creating a sound that appeals to the emotions.

You might say that with electric motors you can give cars a radical make-over. It was similar when things changed from the horse-drawn buggy to the car. Those early cars were designed somewhat like a buggy. Will we go through a similar phase with this?

Sielaff: The combustion engine certainly won't disappear overnight. That means we'll be able to refer to the familiar basics of the car's layout for some time yet. Especially since we are using hybrid technology to bridge the gap to the final end point of an all-electric vehicle. How fast this will gain acceptance in the market is the question. As soon as you're getting around to an all-electric drive you can start considering whether or not to change the basic proportions of the vehicle. We believe that this will of course be an option. When you use a wheel-hub motor and stow the batteries in the underbody you no longer need to allow for an engine compartment. We still require ventilation and cooling, but we can change the complete design of the vehicle. That would be a quantum leap. However, we still need to explore that further.

What would be the ideal solution?

Sielaff: If we succeed in using the electric drive system to have more compact vehicles in big cities, where space is at a premium. That would be a win-win situation for the customer, for society and for technology.

Air supply in the front end is still a vital consideration. Will that change, Mr. Egger?

Egger: Electric cars will always require cooling air, even though the prevailing theory is that everything can be enclosed. We learned this first-hand in the most recent e-tron concept cars.



Not only do the cooling fins fulfill an important function on the e-tron Spyder, they are also a characteristic design element.



“We’ll have to say good-bye to engine noise of the kind we are used to.”

Wolfgang Egger, Head of Design for the Audi Group

“With the electric car we can change the complete design.”

Stefan Sielaff, Head of Audi Design



an instinctive, emotional component. With the steering wheel, we pursue our dream of power, speed and freedom.

When you consider the prevalence of SUVs in large cities, you realize that they appeal to a need many people have in common. They want some way to get out of their daily routine and into a country feeling. It’s purely about emotions. What emotions do you want to touch with your electric cars, Mr. Egger?

Egger: We want to keep on creating and fulfilling dreams for our customers and ourselves. In the electric future we’ll continue to meet the challenge of making mobility a good experience. The values we stand for today – sporty, progressive, sophisticated – must absolutely remain valid and evident in the electric future. ●

INTERVIEW | PETER WIPPERMANN



Watch the interview with the Audi chief designers here:
www.audi.com/ar2010/design

Today’s air scoops are almost reminiscent of those familiar from jet fighters.

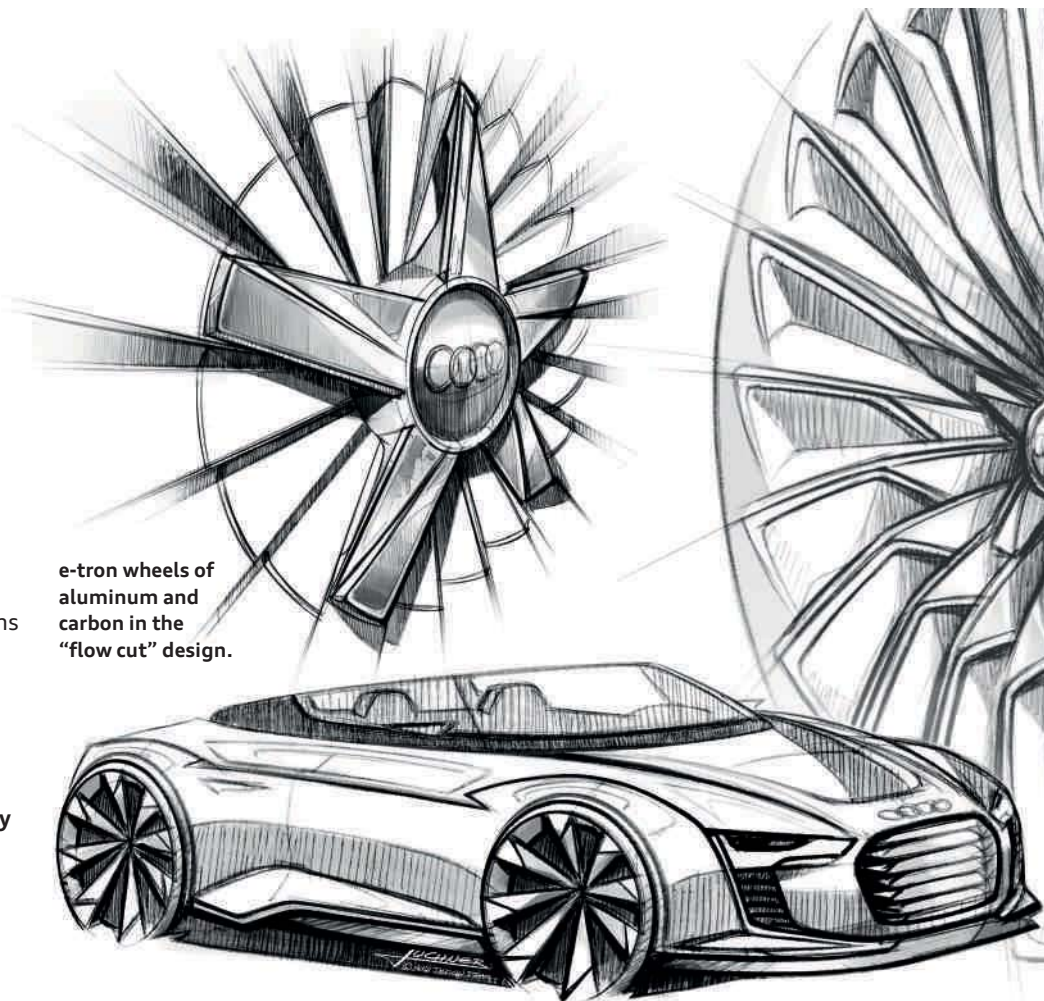
Egger: The parallel to aeronautics is correct. And there are similar ones to marine engineering. Nautical and aerospace styling in particular is influencing current car design.

Mr. Sielaff, another question about the interior: How will you integrate the Internet – something invisible that’s very difficult to express in a design?

Sielaff: You would hardly be able to drive at 220 km/h on the highway while surfing the Internet. That means we’ll have to find ways of using the Internet while driving. Perhaps by voice operation; or maybe you could have something read out to you.

When will the steering wheel disappear? Couldn’t it be replaced by a control stick or a touchscreen?

Egger: I don’t think so. There have been attempts to do so in the past. But everybody came back to the steering wheel. Because it embodies



e-tron wheels of aluminum and carbon in the “flow cut” design.



Configuration

Three-dimensional customizing

Customers traditionally have not seen their new Audi until the day they pick it up. Showroom configurators now allow customers to design and experience their own virtual Audi.

Customer consultants at the Ancona Audi Center in Italy already use the 3D configurator with one out of three customers.



Audi customers have a wide range to choose from. The 3D configurator allows them to assemble their very own Audi, step by step – from its color to its equipment.

Just one click makes 11 Audi model lines appear. Four pairs of eyes are glued to the large screen. “*Avanti!*” And off we go! The Puca family want to purchase a new car. They have been customers of the Ancona Audi Center on Italy’s Adriatic coast for eight years. But this visit is different. This time, Audi customer consultant Michael Morbidoni will not be alone in helping the family to decide. A very recent addition will also help: the showroom configurator. A new and interactive sales tool which portrays images in three dimensions.

Their new vehicle is going to be an A7 Sportback* – the members of the Puca family are agreed on that. As for its engine, equipment package and body color, however, the four still have a lot to talk about. 12-year-old Vittoria fidgets impatiently on the black leather couch, biting her lip. Her father wants a black Sportback, but she prefers white. That would be much prettier, she feels. “I’ve already put it all together online.”

The showroom configurator is namely an extension of the online configurator. Customers can thus



The Puca family (from left to right: Gianluigi, Beatrice, Elisabetta, Vittoria) want to buy an Audi. Their customer consultant uses a touchpad to help them configure.

assemble their own personal Audi online. Once they are done configuring, they receive an Audi code which they then take to the dealership. A customer consultant enters the code and the customer’s preconfigured vehicle appears on screen. Both configurators offer the same selection tools. In contrast to the website, images at the dealership can be viewed in 3D. High resolution makes the simulated vehicles seem quite real indeed – just on a smaller scale. The Puca family can examine their A7 Sportback from any point of view – the interior and exterior alike. Any modification appears in a matter of seconds on the screen, which is on the left of the showroom.

Thanks to high resolution, simulated vehicles are like small versions of the real thing.

The Ancona Audi Center is surrounded by vineyards. The charm of Gothic architecture hardly extends to the industrial park itself. But the dealership certainly stands out. After all, it is the first Audi terminal in all of Italy. Moreover, the showroom configurator has been assisting with sales consulting since March 2010. There is a simple reason for this: Audi currently offers 38 models and derivatives, all of which have countless equipment versions. No Audi Center can display such a rich variety under one roof – not even Audi dealer Paolo Giacchetti in his 4,000 square meter showroom. The 3D configurator, on the other hand, can.

The Puca family and their customer consultant, Mr. Morbidoni, are seated in front of the screen. As the family

express their wishes, Mr. Morbidoni uses a handheld touchpad to help them configure step by step. Gianluigi and his daughter Vittoria disagree again. This time it concerns the color of interior equipment. Vittoria pleads for beige leather seats – after all, her dad decided that the A7 Sportback’s exterior will be black. Mr. Morbidoni taps the touchpad and the interior changes at once from black to beige. Vittoria beams at her father, her braces gleaming. “*Va bene!*” says Gianluigi, yielding to his daughter. OK, the interior trim will be beige.

They have spent some 30 minutes with the 3D configurator. Giacchetti explains that a sales consultation typically lasts half an hour to an hour, depending on the model. He uses the multimedia tool with, on average, every third customer. “Just for the A7 Sportback, there are 13 different paint colors, 19 types of leather and six steering wheels to choose from,” explains Mr. Giacchetti. “The configurator allows salespeople and customers to jointly consider all these options.”

The Puca family are now content: They have finished configuring their A7 Sportback. Their customer consultant, Mr. Morbidoni, hands Gianluigi a CD containing their very own virtual Audi. Until they come and pick up their new Sportback, Vittoria can view the simulated version at home as often as she wants. And consider whether white might not be prettier after all. ●

LEONIE THIM

3D sales

Top scores

Audi was the first premium manufacturer in Germany to feature 3D configurators at dealerships. Nearly all Audi dealerships in Germany will have them by mid-2011 – and worldwide by 2012. Customers are pleased. According to an online survey, over 80 percent of potential Audi customers in Germany were impressed by the showroom configurator.



Thanks to the configurator, dealerships will in future be able to show all Audi models – in virtual form.

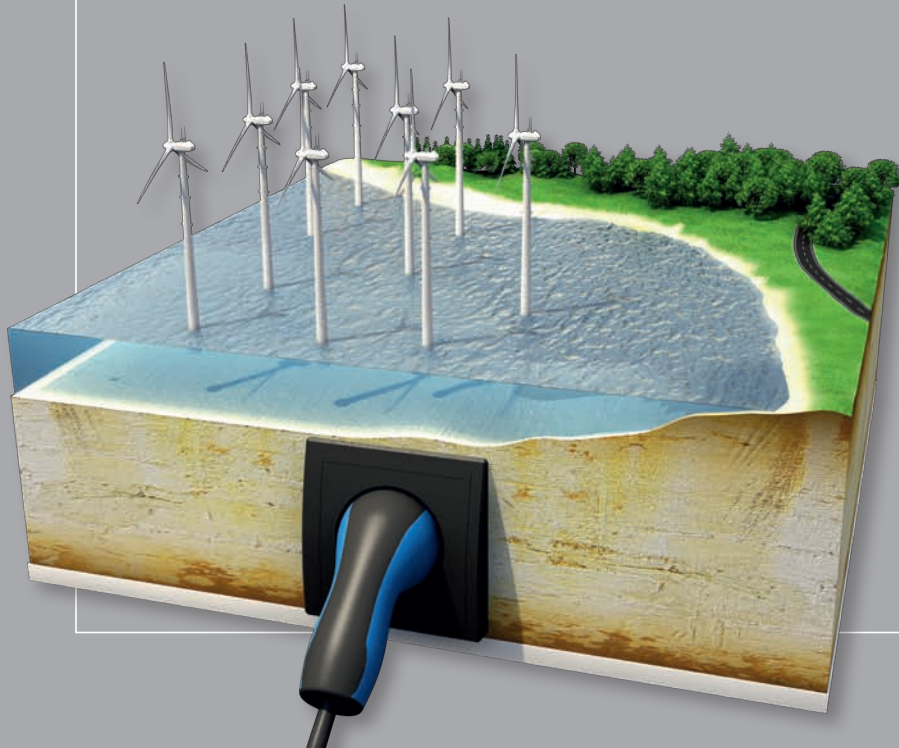


Watch the Puca family configure the car of their dreams here: www.audi.com/ar2010/configurator

Making better use of new energy



Cross-country skiing legend Bjørn Dæhlie (right) talked to Audi CFO Axel Strotbek about outstanding achievements (p. 106).



Offshore wind parks generate
eco-energy for electric cars (p. 104).

102 **Every cell counts**
What people and electric cars
have in common.

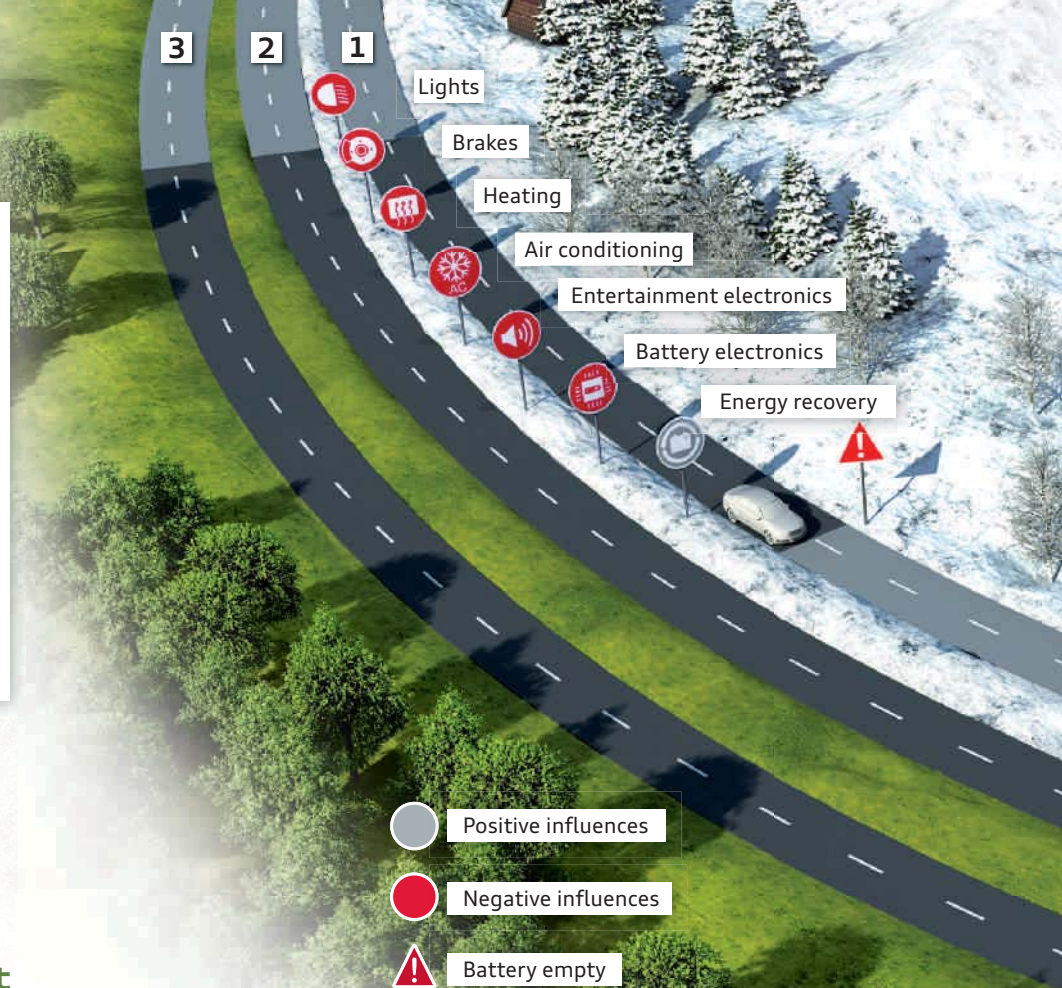
104 **The power of nature**
How water, wind and sun make
climate-friendly driving possible.

106 **"The next success matters,
not the previous one"**
Axel Strotbek talks to
winter athlete Bjørn Dæhlie.

Route 1

Range under extreme conditions

The range of an electric car decreases rapidly when the air conditioning or other consumers such as the seat heating are switched on to full power. Wasteful driving behavior also has a negative influence on range. And extremely cold temperatures likewise restrict battery power significantly.



Battery management

Every cell counts

There is one thing that electric cars have in common with humans: Their success depends on using scarce energy resources as intelligently as possible.

Drivers of today's all-electric cars have to do more than just carefully plan their intended route. In order to calculate their range, they also have to account for factors such as the outside temperature, which is at least as important as the route when it comes to reaching a destination.

"Many drivers of conventional cars become nervous as soon as the fuel warning light comes on, even though the next gas station can't be all that far away," says Jens Kötzt, Head of Networking and Energy Systems at AUDI AG. "But anyone climbing into a fully charged electric car is essentially running on reserve from the outset," continues the engineer.

Confronted with limited battery capacities and scarce recharging options, Kötzt and his team hone the electric Audi models for maximum efficiency. Energy consumers such as the seat heating or air conditioning have to be cut back in the interest of greater range. "So that you don't have to offer more basic concepts, the key to success lies in the intelligent networking of an electric car," explains Kötzt. "The incorporation of weather data, route planning, thermal pre-conditioning, use of comfort and convenience features and road characteristics adapted to the planned route ultimately contributes to a significant increase in range."

Peak torque can be reduced and energy can even be recovered, for example. The recuperation system feeds electricity back into the battery during braking. In terms of intelligent energy management, the efficiency strategies of an electric car are comparable to those of a biological organism. Sophisticated electronics carefully monitor consumers in a car; in the human body, priorities are set by the pituitary gland, among other things. When the body is under stress, this gland tells the adrenal cortex to secrete cortisol in order to mobilize emergency reserves, for example.

Flexibility is the key to success

If the battery runs empty on the open road, the Audi A1 e-tron study has a range extender that springs into action. The compact rotary engine generates energy with which the vehicle is powered via the electric motor and the cells are recharged. Strictly speaking, the human body also includes a type of hybrid system. When push comes to shove and the blood sugar level is no longer able to meet the muscles' energy requirements, hormones such as noradrenaline or glucagon cause the body to burn fat.

A particular challenge with regard to battery management: cold temperatures when high performance is wanted.

Route 2

Range with normal driving behavior

Prudence and effective technology already enable good ranges today. Recuperation allows energy to be recovered, adjustments to torque save electricity when starting off, and economical use of electrical consumers enables electric vehicles to cover longer distances.

Route 3

Range – the ultimate goal

The evolution of battery technology is still in its infancy. Greater capacities and improved battery management will increase the range of electric vehicles substantially. Lower-weight cells and vehicles as well as progress in drive technology are alleviating people's fear of running out of energy and replacing it with pure driving enjoyment.

Weight reduction

Thermal insulation

Optimized cooling

Improved steering

Optimized battery electronics

Improved drive technology

The temperature inside a lithium-ion battery should always be between 25 and 55 degrees Celsius. If it is too cold, the cells' internal resistance increases rapidly – by as much as a factor of ten. Battery output plummets. Heat, on the other hand, greatly accelerates the aging of the cells.

Audi engineers are therefore investing particularly large amounts of expertise into optimal temperature management. This is also essential elsewhere, as the human body must likewise maintain its temperature within a narrow normal range at all times in order to survive.

Caution: chain reaction!

Chain reactions, such as when overcharging destroys a cell, represent a major risk for an electric car's battery block. "The overall functionality of a battery is determined by its weakest cell," warns Kötzt. Safety intervals and good heat dissipation are therefore used in addition to charge status monitoring to protect the battery against secondary damage.

After all, slight damage should not result in the failure of the overall system. The human body uses new blood vessels to bypass a blood clot for similar reasons.

Lithium-ion batteries are a still relatively young technology and unlike humans do not require millions of years to achieve gains in efficiency. Audi uses a trick to speed up their "evolution." The development engineers subject test batteries to permanent charge and discharge cycles on battery test rigs. This accelerated aging helps them to quickly develop new high-voltage batteries with greater energy capacities while maintaining a constant level of safety and extending service life. Such fast-paced generational changes mean that even reluctant people can overcome their nerves and partake in the electric mobility of the future. ●

FALKO BLASK



An audio version of this article is available at:
www.audi.com/ar2010/battery

Electric mobility

The power of nature

Water, wind and sun: Renewable sources of energy are revolutionizing energy supply – without them, climate-friendly driving would be impossible.

It is already a certainty that many people will drive electric vehicles in times to come. “And Audi is working at top speed on the future of mobility,” confirmed Rupert Stadler, Chairman of the Board of Management of AUDI AG, at the unveiling of the fleet trial with the Audi A1 e-tron. The increasing importance of electrification and renewable energy is an impetus for – and the outcome of – a fundamental paradigm shift with regard to the global energy supply. Not only are petroleum, natural gas and coal finite resources – their use is also a cause of global warming. The solution lies in a complete changeover to energy supplied via renewable sources. This would not only satisfy the world’s continuously increasing appetite for energy, but also limit warming of the Earth’s atmosphere during the 21st century to the two degrees Celsius which climatologists argue would be just barely tolerable.

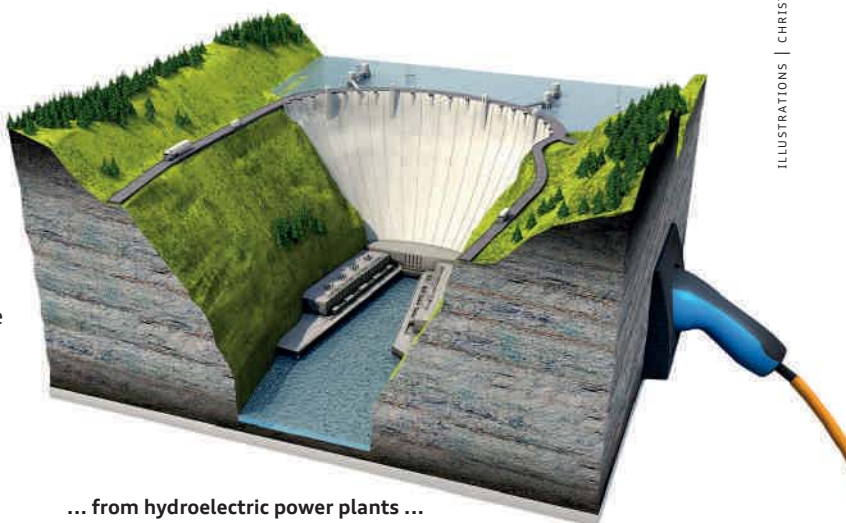
Electricity comes from decentralized units as well as wind and hydroelectric plants.

A number of studies show that this changeover is possible. According to a recent study by Germany’s Environment Agency, Germany could “always use electricity generated using exclusively renewable energies” as soon as 2050. A meticulously researched roadmap by one of the world’s largest audit firms came to the same conclusion – for all of Europe and northern Africa.

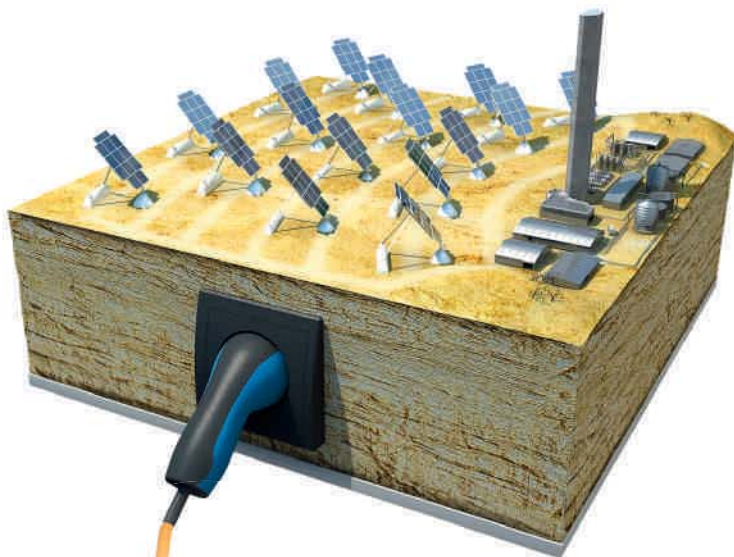


The trinity of future energy supply:
Electricity from offshore wind parks, ...

It is an ambitious goal. The National Electromobility Development Plan approved by the German government in 2009 envisions more than five million electric vehicles on Germany’s roads in 2030. To this end, some four billion euros in subsidies are to be invested to promote research and development as well as the training of specialists in coming years. And the automotive industry plans to invest a further 10 to 12 billion euros just on the development of alternative drive systems.



... from hydroelectric power plants ...



... and photovoltaic systems ...

For now, however, some 80 percent of Europe's electricity is produced in large-scale centralized power plants, transmitted to energy providers, and ultimately sold to consumers. Power grids in the future, conversely, will be fed by very different sources. Electricity will be generated not only in decentralized wind, photovoltaic, biogas and geothermal plants, but also by offshore wind parks in the Baltic Sea and the North Sea, hydroelectric power plants in Scandinavia and large-scale solar installations in the Sahara.

Wind-generated and solar electricity from deserts could supply power to Europe and northern Africa.

Desert areas in particular offer great potential. The energy radiated by the sun onto deserts just in the Middle East and northern Africa equates to 630,000 terawatt hours annually. That is 30 times as much electricity as the entire world generated in 2010. If the globe's sunniest regions had thermal solar power plants encompassing 83,000 square kilometers – about the size of Austria – then the world's current demand for electricity would be satisfied, mathematically speaking.

Dii GmbH, an industry initiative striving to realize the DESERTEC vision, wants to turn these calculations into

reality. AUDI AG supports Dii GmbH as an associated partner. The industry initiative's stated objective: to supply most of northern Africa and the Middle East and at least 15 percent of Europe with electricity generated by wind and the sun in the deserts between Mauritania and Sudan by the year 2050. A high-voltage direct-current (DC) system is therefore scheduled to connect northern Africa and Europe. Prof. Dr. Hans Müller-Steinhagen, chairman of Dii's International Advisory Committee, estimates a need for some 1,000 solar power plants and a good 400 billion euros – spread out over 40 years – to be invested in power plants and DC cables. A high-voltage cable has already been laid between Morocco and Spain; a second cable between Algeria and Italy is being planned, as is the construction of the first power plants in Morocco and Egypt.

Audi already feeds electricity from renewable sources into Germany's power grid.

Audi is actively working on this path to a resource-efficient future. During the transitional period, the carmaker will continue to improve the fuel efficiency and reduce the CO₂ emissions of combustion engines. Engines will also be modified for use with biofuels, which are obtained from plant raw materials. Last but not least, Audi will of course continuously enhance hybrid and electric drive systems – which are already being put to the test in e-tron models.

Yet new vehicle concepts are not the Audi Group's sole contribution to this move toward alternative forms of energy. The carmaker already obtains a substantial percentage of the electricity required for producing vehicles from renewable sources – and photovoltaic systems on the Audi production buildings already feed green electricity into Germany's power grid. ●

JÜRGEN BISCHOFF



An audio version of this article is available at www.audi.com/ar2010/energy

... provides energy for electric mobility, thus conserving our resources.





Bjørn Dæhlie and Axel Strotbek (right) in front of the 13.5-meter high Audi hill at Munich Airport. It was constructed for the presentation of the new A6.

Axel Strotbek and Bjørn Dæhlie

“The next success matters, not the previous one”

Cross-country skier Bjørn Dæhlie and Audi CFO Axel Strotbek discuss goals, discipline, success and the common ground between competitive sport and being the market leader.

Axel Strotbek has been Member of the Board of Management for Finance and Organization at AUDI AG since fall 2007. Prior to that he was Executive Vice President Finance for Volkswagen Group China in Beijing. In his free time he participates in endurance sports.

Bjørn Dæhlie is the most successful athlete in the history of the Winter Olympics, with eight gold and four silver medals to his name. The Norwegian cross-country skier now runs a skiing and sportswear company and develops wind farms for power generation.

Strotbek: You are one of the most successful winter athletes of all time and are renowned for your disciplined training. Is that the secret to your success?

Dæhlie: Discipline is naturally a part of it. But it all started with something else: a dream. You know, cross-country skiing enjoys a very special place in Norwegian culture and people are passionate about it perhaps in the same way that the Germans are about soccer. In Norway every boy and girl

learns how to cross-country ski. I was no exception. And when I saw the winners on television at the Winter Olympics, even as a small boy I had the dream of one day standing on that podium myself. Then I started to train. I learned the technique, I loved skiing and with each year that passed I improved a little. But I was never satisfied. I always wanted more. After I had won my first international race, I cried because I sensed that I really could achieve something.

Strotbek: If I understand you rightly, for you it was all about perfecting your technique, a passion for sport and the fulfillment of a dream. I can certainly empathize with that. Here at Audi, we are motivated by similar things: technology and passion. It can take a long time for the first big success to come. But the secret then is not to ease off, and to stay in a leading position.

Dæhlie: That's another common area between sport and business: When you've won a gold in sport,

it's tempting to rest on your laurels and relax. The same applies in the world of business. Some companies lose their drive, creativity, powers of innovation and customer focus once they become market leader.

Strotbek: How do you resist the temptation to ease off?

Dæhlie: My motto was: You aren't Olympic Champion, you're capable of becoming Olympic Champion. Even if you've just won gold your competitors still want to beat you, and if you don't keep improving they will succeed. I didn't hang my medals on the wall, I didn't want to have them in front of me all the time. I put them in the basement. The medals that you own are the past. I was focused on the future, on the next success – not the previous one. That was my personal approach. But how does Audi handle the necessity never to ease up and to keep improving?

Strotbek: The main reason why Audi is so successful is that our brand is remarkably innovative, sporty and

progressive. We've introduced quattro drive, TDI technology and extremely high-quality design at Audi. That has already made us number one in Europe, but we're not quite top of the pile worldwide. Yet precisely that is our declared ambition, which is why we are highly motivated. We have clearly formulated timescales and criteria for gauging success on various local markets worldwide. I sense that the entire organization is working passionately towards achieving the goals we have set ourselves, however ambitious they may sound. But after all, competition in our industry is extremely tough.

Dæhlie: I keep discovering similarities between the toughest years of my sporting career and the challenges that I have to contend with in my business. Bj SPORT is not comparable to Audi, we occupy a small niche with our sportswear for cross-country skiing. But there are parallels: the hunger to be better than the competition, and the unflinching will to overcome



Audi Board of Management member Axel Strotbek (left) and the successful winter athlete and entrepreneur Bjørn Dæhlie met for talks at the Audi Forum at Munich Airport.

**“My philosophy:
pure function.
Everything must
be necessary
and perfect.”**

Bjørn Dæhlie,
eight-time Olympic champion



**“Our business has a
great deal in common
with sport. It is
about competition.”**

Axel Strotbek, Member of the Board of Management for Finance and Organization, AUDI AG



boundaries. That is what I have carried over from sport into the world of business. And there's a second realization: Succeeding on your own is very difficult. I always feel I am part of a team. I always tried to remember that when I set up my company. It was clear to me that I couldn't do it on my own and that I needed team players to help me. I looked for people who shared the same spirit as me and wanted to join me in creating the best cross-country ski wear from a technical viewpoint. I think that's one of the benchmarks of success for my brand.

Strotbek: What does mobility mean to you?

Dæhlie: I've a confession to make: When I was at school I designed cars. My friends and I ran an unofficial competition to produce the best sports car designs. Cars have fascinated me

ever since. In fact, my first sponsored car in 1990 was an Audi 100 quattro. I was very proud of it, particularly because it had the rally design. But it's my turn to ask you something: Is it true that you go running every morning?

Strotbek: As well as our enthusiasm for Audi this is another thing we have in common. Sport plays a major role in my life. I try to go running every day. As well as helping me to tank up energy, it clears my mind. Both these aspects are very useful in my job. I'm absolutely convinced that experience gleaned from sport helps you in your professional life: the need for discipline to raise your performance, the ability to handle defeat, and the concentration it takes to succeed.

That is why I also encourage my management team to take part in sport. Our business has a great deal

in common with sport, it is about competition. For it to perform well, it needs a fit organization, quick-thinkers, fast reactions, motivation and the will to win. That's what I try to convey to my team.

Dæhlie: I think there's a kind of sporting ethos that is a fundamental attribute of the business world. I want to become world market leader with Bj SPORT, but at the same time I'm working on erecting a huge wind farm of 100 turbines on the Swedish-Norwegian border. That is also a sporting challenge. But I'm adamant that green energy is the way forward.

Strotbek: Audi, too, sees green energy as the shape of things to come. Energy consumption and CO₂ emissions need to be cut – those are two core objectives of our research and development work. We are already well on the way to achieving them: Our A3 TDI clean diesel was voted Green Car of the Year 2010 in the United States, the Audi e-tron models are charged up on our factory site in Ingolstadt with power from a photovoltaic plant around 19,000 square meters in size, and the 150,000 vehicles that we ship from Emden are brought there by trains running on green electricity. But that's just the start. Audi now also wants to underscore its claim to lead the way in such areas of ecology. We are already considering how to access renewable solar energy sources in the Middle East and North Africa. And wind power will fundamentally also increasingly gain in importance. I am certain that Northern Europe in particular is an excellent region in which to generate wind power. Renewable sources of energy will play a major role in the future. For you, and for Audi. ●

HOST | MICHAEL KNEISSLER

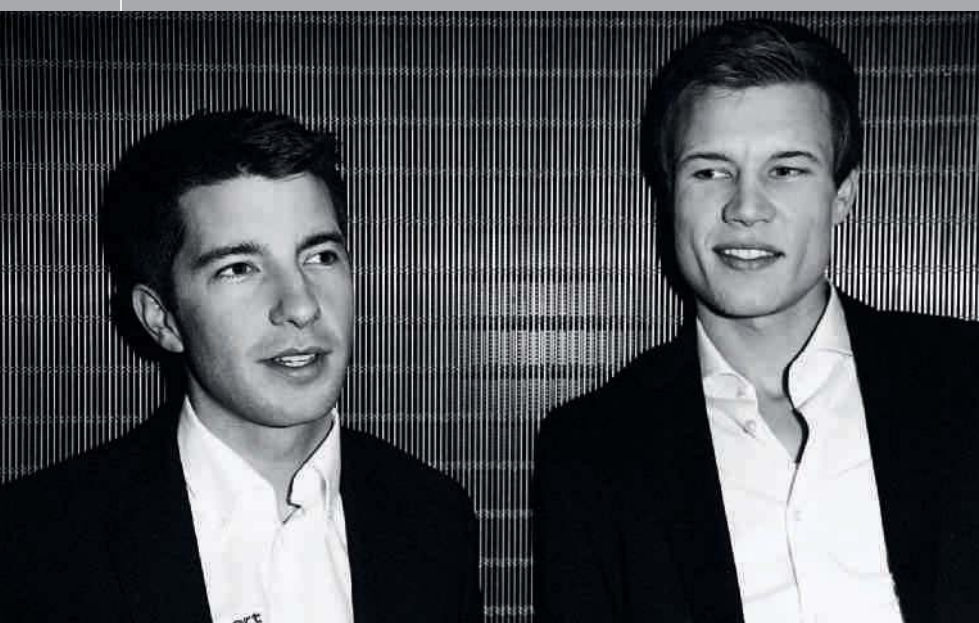


Watch the interview about goals, discipline and success here:
www.audi.com/ar2010/success

Time for new best times



Flowing forms:
The Aventador* sets new
standards in the supercar
category (p. 116).



A discussion between Audi factory driver
Mike Rockenfeller and soccer player
Holger Badstuber (p. 122).

- 110 **Against the wind**
Car models and Nordic Combined
skiers in the Audi wind tunnel.
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700 hp, 12 cylinders –
the new lightweight Lamborghini.
- 122 **“Start reflecting, and
you’ll make mistakes”**
Mike Rockenfeller and Holger
Badstuber talk about speed.

Against the wind

Whether ski jumpers, swimmers or the latest cars – the road to success leads through the wind tunnel. A visit to the storm front.



PHOTO | JAN RIEPHOFF/TANK MANAGEMENT

Storm-tested

The German national Nordic
Combined ski team in the
Audi wind tunnel.



Into the wind

Nordic Combined skier Björn Kircheisen uses the wind tunnel to practice the perfect flight off the ski jump.



A hurricane is raging in Hall 25. While the Audi employees are enjoying their lunch break in the sun outside the flat-roofed building on the Ingolstadt site, a storm with Force 10 winds is raging inside. Six men in ski suits brace themselves against it. **90 kilometers per hour.** The men lean forward, toward the tunnel opening from which the nozzle is blowing the wind. **100 kilometers per hour.** Björn Kircheisen squeezes his eyes shut; one foot slips backward and he pulls it forward again. **110 kilometers per hour.** The six men lean ever farther forward. They are at an angle of nearly 45 degrees. Without the wind in their faces they would fall over. Their faces are distorted. One of them wants to say something, but only manages to utter an unintelligible sound.



Acoustics test: Noises inside the car are measured using mannequins to which microphones have been attached.

115 kilometers per hour. The athletes slide backward. The wind has won this round. The six step to the side.

The men are medalists, World Cup winners, national champions: the German national Nordic Combined ski team. They train at the Audi Wind Tunnel Center, one of the most modern anywhere in the world. Opened in 1999, it was expanded three years ago. There are now three different wind tunnels in Hall 25, in which Audi has invested around 40 million euros.

The facility is used to measure wind resistance and wind noise, simulate weather and test aerodynamics. Every new Audi model makes around 250 trips to the wind tunnel before being launched. Air rushes through tunnel openings in front of and behind the cars at speeds of up to 300 kilometers per hour. The wind tunnel is reconfigured for athlete training, with cable winches mounted on the ceiling of the hall, for example.

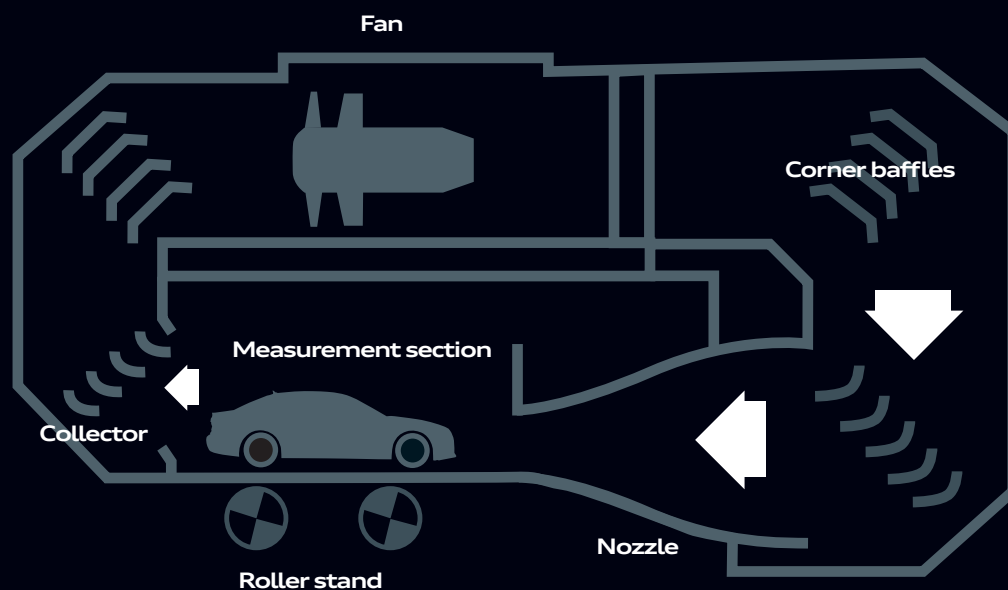
What is it like to stand still at 100 kilometers per hour? "You just have to lean forward," says Kircheisen with a grin just like the one he flashed in Vancouver last year when he won Olympic bronze. The odd-looking exercise trains his feel for flight. "Thanks to the wind tunnel, I am not easily surprised by a gust of wind on the hill," says the 27-year-old.

Training resumes. Kircheisen and his five team colleagues go back to the center of the hall to where the wind is blowing. He and his teammates once again slide slowly backward, take a step forward and slide back again. "Straighten up!" calls the coach.

Robby Pyttel sits at a control panel in the control room, separated from the wind tunnel by a pane of glass. After

The wind circuit

All three Audi wind tunnels are configured as rings. A fan measuring up to 5 meters in diameter generates airflow. Corner baffles ensure that this airflow reaches the nozzle evenly and without turbulence. The nozzle further accelerates the airflow. The air should be uniform when it arrives at the measurement section. The cars to be tested are placed on roller stands to simulate actual driving situations. A collector gathers up the air again and returns it to the fan.



Speedy descent

Simulating the approach on the ski jump. Wind resistance is a determining factor for the take-off speed and length of the jump.



In a tuck

Austrian skier Stephan Görgl tests the wind resistance of his racing suit.



five minutes he presses the black button. The hurricane subsides. The athletes stumble forward, towards the tunnel opening. There is not the slightest of breezes – this lull in the wind means it's time for a break.

Pyttel has worked as an engineer in the wind tunnel for three years. He now opens the metal door of the control room and goes to where the storm was recently raging, directly into the tunnel opening. The 31-year-old points to the steel walls and the slots in the floor that catch any items blown away by the wind. Finally, the five-meter-tall turbine with the 2.6 megawatt motor that had the Nordic Combined skiers sliding backward.

Audi cars undergo 6,500 hours of testing each year in the three wind tunnels. The tunnels are used by special guests the rest of the time. Australian swimmer Ian Thorpe tested his swim suit here, and Alpine skiers from Germany, Austria and Switzerland train here almost every year. The ski jumpers of the German Ski Association leaned into the

The new models of the future are sent to the wind tunnel four to five years before they are launched; during the design and development phase, in other words. The newest section of the facility starts behind the next metal door. You could call it an oven, but it would be equally correct to call it a refrigerator depending on when you enter it. Drains can be seen in the floor of the measurement section; heat lamps are mounted on the ceiling. Weather from around the world can be recreated in the climate wind tunnel, which was opened back in 2008. All the way from Siberian cold at minus 25 degrees Celsius to bone-dry, 55-degree Saharan heat.

At this very moment, an Audi A4 is demonstrating that it can free windows from a millimeter-thick layer of ice in just a few minutes. Pyttel points to the heat lamps on the ceiling, which produce actual UV light. The engineer explains that you would get sunburned if you were to stand under the lamps while they were switched on.

Pyttel continues forward past an A1 in which mannequins with microphones are sitting. A case for the acoustics wind tunnel, where wind noises are recorded inside the car. Every irritating source of noise is tracked down here to deliver the ride comfort expected of a premium vehicle.

There are further tests that enhance safety. How does a car behave aerodynamically at 150 kilometers per hour? What happens if there is a sudden gust of wind from the side? What measures reduce wind resistance and thus fuel consumption? These are the types of questions that Pyttel and his more than 60 colleagues working in two shifts at the Wind Tunnel Center have to answer.

But these questions will have to wait this afternoon. Right now it's the Nordic Combined team's turn. Next training session. Kirchseisen is hanging from two ropes as his coaches pull him up under the ceiling. Facing into a strong headwind, he is supposed to simulate the flight following takeoff from the hill. A ski jumper normally

lands in the snow after no more than four or five seconds. In the wind tunnel, Kirchseisen practices a perfect flight lasting two minutes. "There is nowhere else we can log so many flight miles," he says.

The man with the red helmet spreads his legs slightly so that his skis form a large V. "Tense up your body!" says Kirchseisen's coach. Then he raises his hand and says, "Go!"

In the control room Pyttel presses the black button again, and the next storm breaks out. ●

STEPHAN SEILER



Siberian cold: Wind Tunnel staff test the heating and air conditioning system of an Audi A4 at an outside temperature of minus 25 degrees Celsius.

man-made wind a few days before the Nordic Combined skiers. The bob sledders are also scheduled to return soon from Switzerland.

A train manufacturer also chose the Audi wind tunnel for testing a model of its latest high-speed train. And, of course, the Audi DTM and Le Mans racing cars are brought to the wind tunnel for aerodynamic optimizations to the chassis and suspension, spoilers and the nose to shave off the decisive thousandths of a second.

"This is the most diverse job I could ever imagine," says Pyttel as he walks past covered prototypes and life-size clay models of cars. No photos are allowed in this secure area!



Watch the German ski jumpers in the Audi Wind Tunnel Center at: www.audi.com/ar2010/windtunnel



Lamborghini Aventador

The fiery Italian

Tradition and future with lightweight design. Completely new – yet with a long history. With the Aventador, Lamborghini reveals the fastest manifestation of Italy yet. The supercar generates 515 kW (700 hp) with its 12 cylinders.

They are the same three questions that everyone asks – no matter how old or experienced – when they first confront the Lamborghini Aventador*. How fast is it? How powerful? How many cylinders? But these questions can't initially be expressed upon first meeting the car. The senses are still too dazzled when the latest supercar

from the Lamborghini brand swoops past you at its top speed of 350 km/h on the Pista di Nardò, the famous high-speed testing track in South Italy. Its first appearance leaves no room, not even for a short question, as wordless astonishment spreads over the Apulian countryside like the untamed symphony of the 515 kW (700 hp) 12-cylinder engine. Your head is still

virtually empty minutes later, as if the airstream created by the supercar had swept your thoughts away with a hurricane-strength gust.

That was mid-November 2010. At that time the Aventador had not yet been given its name. "Our team called it 834 – short and sweet," explained Anna Trevisoi, Research and Development Project Manager



Distinctive
wedge shape:
the Lamborghini
Aventador

for the new Lamborghini. Her primary responsibility as project manager was to arrange the technical work, establish a timeline for the project, and manage the flow of information between the departments at Lamborghini and Audi. And “834” is her baby. Since the beginning of the development work, the engineer has guided the challenging, ambitious

and trendsetting project. Challenging because the car was not the only thing that needed to be fast – the development needed to be fast as well. Trevisoi: “We started with the work at the end of 2007. We only had three years to have the car ready. That’s a very tight schedule.” Ambitious primarily because the Lamborghini is not a revised version. “One challenge

in the construction was that everything is completely new. We simultaneously developed a new steering system, new mechanics, a new engine and a new design – in other words, a completely new car.” And trendsetting because the Aventador* uses innovative materials and technologies. “Our car is a great example of how carbon-fiber can be used. It’s the first series-production

Anna Trevisoi

“It’s the first series-production Lamborghini with a driver’s cockpit made from carbon fiber-reinforced plastic.”



Lamborghini with a driver’s cockpit made from carbon fiber-reinforced plastic,” Trevisoi explained. The fact that the supporting architecture is made from carbon fiber – the highly stable lightweight material known from aerospace construction – offers significant benefits. It reduces the weight of the car, while also increasing the stiffness of the entire vehicle.

The development efforts are especially clear when you take a look

at the all-new heart of the Aventador*, which was developed in Sant’Agata Bolognese. The 6.5-liter 12-cylinder engine has an impressive 515 kW (700 hp) output with 8,250 rpm and maximum torque of 690 Nm. Plus a torque curve that promises extremely responsive behavior under acceleration. The Aventador takes 2.9 seconds to sprint from zero to 100 km/h. But even at over 250 km/h, it continues to drive on powerfully to its top speed as if the

natural laws of air and road resistance do not apply.

But the engine is not just extremely powerful and high-revving – it’s also very compact and light. From each kilogram of engine weight, the engineers have been able to squeeze out nearly three horsepower! In all, the engine weighs no more than 235 kilograms thanks to its crankcase and four-valve cylinder heads made from an aluminum-silicon alloy.



The engineers have been able to squeeze out nearly three horsepower from each kilogram of engine weight.

The light 12-cylinder engine is joined by a high-tech transmission featuring a completely new construction for supercars. This weighs a mere 79 kilograms. The Lamborghini ISR is an automated manual transmission that combines minimal shifting times with the convenience needed for everyday use. Gear changes are almost twice as fast as with its predecessors.

Setting technology trends rather than merely following them – a standard that every Lamborghini must fulfill. But a car with the bull on the hood also has to embody a tradition, and the number of cylinders is just one parameter. The Aventador* links with the past primarily through its design, just like its predecessor, the Murciélago. It does so by continuing to develop and update the extreme stylistic elements and the aerodynamics. The design elements that the Murciélago drew from its three predecessors – the Miura, Countach and Diablo – are also reflected in the Aventador. These include the rear louvers which make the Murciélago reminiscent of the legendary Miura, an automotive cornerstone in the history of carmaking and one of the first designs by the still-young company established by Ferruccio Lamborghini in 1963. The Miura was produced from 1966 to 1973. It ensured the continued existence of the carmaker, enabled the development of new models, and was

a technical sensation in itself. Up to that point, mid-engines transversely mounted directly behind the seats were known only in racing. Named after Eduardo Miura, a breeder of Spanish fighting bulls, the sports car with the pop-up headlights also influenced the naming of all of its successors. It became the tradition to select names for the models from the field of bullfighting. The Espada of 1968 was named after the sword of the toreros, and the Gallardo of 2003 was named for a race of fighting bulls. But most of the names selected for the cars can be traced to the names of famous fighting bulls – the Islero, the Reventón, and now the Aventador, whose namesake thrilled audiences in Zaragoza in 1993. And of course there was also the Murciélago, with which Lamborghini honored a legendary animal that was granted clemency in 1879 after a fight in the arena of Córdoba, due to the courage it displayed.

With its wedge profile, which is also a distinguishing element of the Aventador, the Murciélago recalls the angular shape of the Countach, built from 1974 to 1990. That car, with its speeds of up to 330 km/h, was the flagship model at the time for the Lamborghini brand. Often equipped with a truly massive rear wing, it was naturally also powered by a V12 engine.



Lamborghini employees at the plant in Sant'Agata Bolognese pull the camouflage film from the Aventador, a completely new development (left). Its 515 kW (700 hp) 12-cylinder engine is located behind the sports seats – following the tradition at Lamborghini.



An interview with Anna Trevisoi

“It’s got that typically masculine Lamborghini sound”

Do you like to drive fast?

Yes I do, and always have. I like driving cars in general.

So you drive your company Lamborghini to work?

Oh, no. I drive my Audi A3. It’s a great car.

The project for the successor to the Murciélago started in 2007. Was it a challenge?

When I started, I was actually a little worried about how I could bring together the many highly talented engineers. They all have tremendous abilities. We had to communicate a lot, and the short timetable required close cooperation.

Did the Aventador* turn out to be a true Italian?

I think that the car as a whole is in the tradition of Lamborghini – from the handcrafted interior to the new 12-cylinder engine.

How does it sound?

It’s got that typical Lamborghini sound, yet it is still different from its predecessors. It’s a really penetrating, masculine sound.

Masculine?

Yes, because the sound is strong, aggressive. You can’t help but turn around to look when you hear it.

Which part of the finished car do you like best?

My favorite is the extendable rear spoiler. It makes the car look even more impressive.

Do environmental aspects play a role in the construction?

A very important one. The engine has been developed for unsurpassed efficiency. The goal was 8 percent more power with 20 percent lower consumption when compared with the predecessor. We’ve succeeded in that.

Lower consumption? People who buy a Lamborghini don’t really need to worry about fuel prices ...

But the Aventador is not exclusively developed for people who have a lot of money. It is a high-tech car – even when it comes to fuel consumption and emissions.



Elemental force from behind: The rear signals power, confidence and character. The wedge-shaped front lights evoke the company’s history.





The Murciélago itself is a symbol of automotive art with a mixed Italian and German heritage. The speedy roadster continued to show its capability in the final months before production ended with models like the LP 670-4 SV and the Reventón. And it pointed to the path into the future that the Aventador* is now following.

But before that point arrived, Anna Trevisoi had to drive many laps on the test track in Nardò with her 834. "Driving it is a huge surprise, since because of its design you expect it to be a very dangerous car." But behind the wheel, the driver quickly discovers the opposite. "Due to the stability of the suspension, the responsive

all-wheel drive, the precision of the steering and the exact response of the engine, each drive is an emotional experience, but you still feel safe all the same." ● SVEN SCHULTE-RUMMEL



Watch a film about the Lamborghini legend at www.audi.com/ar2010/lamborghini

Best times

Holger Badstuber
(left) and Mike
Rockenfeller agree:
In both soccer and
motor racing, being
the fastest really
does matter.

Athletes talk shop

“Start reflecting, and you’ll make mistakes”

Mike Rockenfeller is a racing driver who has been interested in soccer ever since his childhood. Holger Badstuber is a soccer player who likes driving fast cars. The two professionals met up to swap notes on the importance of speed, endurance and strategy in their sports, and maybe learn from each other.



France, June 13, 2010.

Only two minutes remain in the 24 Hours of Le Mans.

A throng of people squeezes into the confined space on the command post. Just 100 meters to go, then 50, 40, 30, 20, 10: All three Audi R15 TDI cars cross the finishing line in succession. Mike Rockenfeller is one of the three drivers of the winning car. He throws his arms into the air, while jubilant team colleagues hoist him onto their shoulders. He has earned his top spot on the podium.

South Africa, June 13, 2010.

Germany are playing Australia in the group stage of the soccer World Cup. The packed stadium resounds to the chants of a 63,000 crowd and the drone of vuvuzelas. You can barely hear yourself think, but Holger Badstuber remains calm. This is his first World Cup appearance in his still-young career.

At first glance, soccer player Holger Badstuber and racing driver Mike Rockenfeller seem to have little in common. But last year was a very important one for both of them.

A regular in Bayern Munich's first team since 2009, Badstuber played his first two international games for Germany in 2010. Aged only 21 at the time, he was one of the team's youngest players and is regarded as one of the top defenders of the future.

Mike Rockenfeller has been driving for Audi in the DTM and at Le Mans since 2007. He also drives the R8 LMS in the GT3 class. Now 27, he has made history as the youngest Audi driver ever to have won the 24 Hours of Le Mans.

The car needs to be fast, to start with. Then a racing driver needs to drive fast and have good reactions if he wants to win. But every race presents the drivers with a different set of challenges. In a sprint race like the DTM, top speed on bends and straights are important, but nothing beats a fast lap time. "In endurance races the driver and engines also need staying power," says Rockenfeller. "Those qualities are particularly important when you're engaged in a duel with an opponent."

Badstuber nods. Winning a one-on-one is also important in soccer. "The game is getting faster all the time,"

explains the soccer player, turning to Rockenfeller. Recent studies have shown that players spend almost one-third of every 90 minutes running at high speeds. Short sprints cover an average distance of 17 meters. That makes the game increasingly tight and calls for more dynamic actions. Players therefore "fundamentally need to show pace and be fast on the ball," explains Badstuber with a smile.

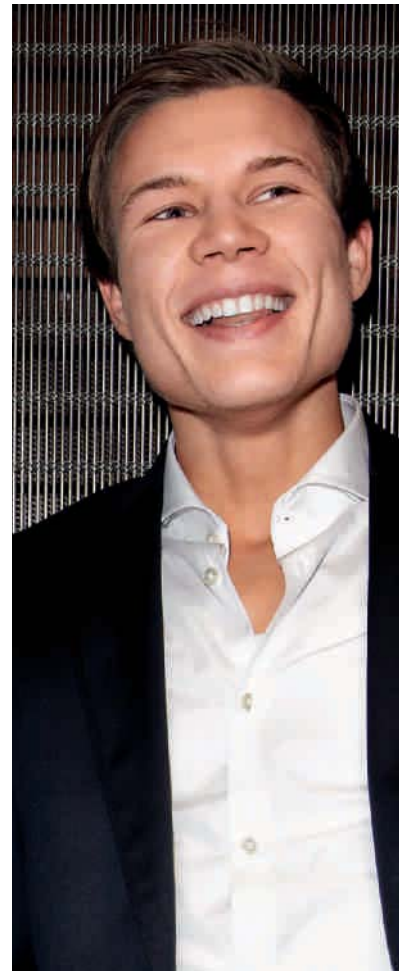
Endurance involves being able to withstand exertion for as long as possible without flagging either physically or mentally. These are two sides of the same coin for both Badstuber and Rockenfeller. Mental endurance "provides the very foundations of physical endurance," explains the racing driver. "There are plenty of people with a talent for driving fast, but not many with the necessary mental resilience," remarks Rockenfeller, tapping his temple with the index finger of his right hand. "That's what makes the difference."

Endurance also includes being able to recover from exertion quickly. Between DTM sprint races, Rockenfeller finds





Mike Rockenfeller (left) and Holger Badstuber are motivated by the same things: speed, endurance and strategy.



new energy by spending time with his family and with friends. There is no time for that during an endurance race such as Le Mans. Being in action for 24 hours, including right through the night, is a real drain. You need to find some peace and quiet so that you can concentrate and recharge your batteries quickly. "I never lose focus during a race," declares the racing driver. "But when you're in the lead, you suddenly start to reflect on your next moves." Things can then get precarious. "That's when mistakes happen."

Badstuber, too, recognizes the danger. "You need to keep your concentration going throughout the whole game." As a soccer player, he makes intensive mental preparations and plays through the moves in his mind – over and over again. "In soccer, strategy is even more important than speed," he concludes. "As a professional, you need to know your opponents, analyze their weaknesses and play to your own strengths." Badstuber is left-footed, so he hits the ball more powerfully with his left foot than with his right. He is also highly

regarded by his team colleagues for his passing technique and positional play. Those are his strengths, and the reason why coaches prefer to play him on the left side of central defense.

Rockenfeller agrees that strategy is also important in motor sport. "Our 2010 win at Le Mans is a good example," explains the 27-year-old. "We soon worked out that we weren't going to be the fastest." Instead, a change of strategy was called for: to protect the engines and concentrate on endurance, rather than push the cars to the limits and drive on full throttle. At various times a number of other

contenders held a commanding lead. But one by one, they were forced out of the race by technical faults.

Rockenfeller's ambitions for 2011 are to "drive a lot and compete in both the DTM and Le Mans. Winning Le Mans again would be just brilliant." And the soccer player? "I want to keep developing as an individual and a player," he declares, with ambitions to remain at the top of his game in the Bundesliga, the Champions League and the next World Cup. ●

LEONIE THIM



An audio version of this article is available at: www.audi.com/ar2010/athletes

Audi and Bayern Munich

Strong partners

AUDI AG has also been a shareholder of FC Bayern München AG since 2010. The association that dates back to 2002 has consequently been taken to a new level. AUDI AG is also the exclusive vehicle partner of the record-breaking German league champions.



In 2010, coach Louis van Gaal secured the German league title and won the German Cup with his team Bayern Munich.

Authors and team

The faces behind the stories in the Audi Annual Report



Former world rally champion
Stig Blomqvist at the photo shoot on
the Audi testing grounds in Munich.

Olaf Tamm

Photographer, Hamburg

"For me, the most exciting thing about photography is that you can capture moments, situations and moods," says Olaf Tamm, 48.

He has been photographing people and cars for magazines such as Stern, Spiegel, Mare and Merian since 1992.





Thomas Ammann
Journalist and film producer,
Hamburg

He's the specialist: Thomas Ammann, 54, first trained as a car mechanic before becoming a journalist and film producer. The car expert likes nothing better than tinkering with his classic cars in his workshop at home.



Tim Gutke
Freelance journalist, Munich

There's no risk that Tim Gutke, 33, won't take for his stories: For example, he cycled 1,600 kilometers through Greenland, and on another occasion he spent a week with a shaman. And when he's not writing? He teaches, develops new magazines, assists in art projects or plans his next adventure.

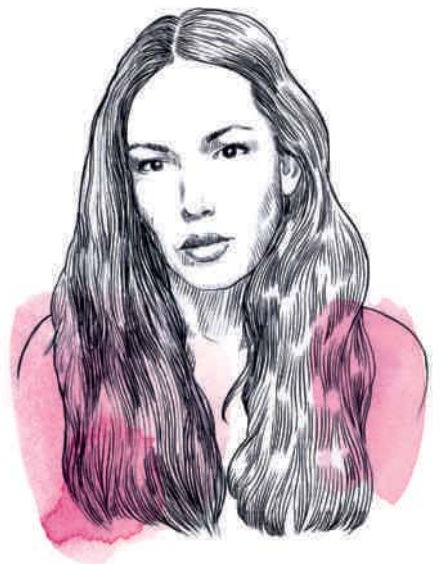
Prof. Peter Wippermann
Trend researcher, Hamburg

He knows what tomorrow will bring: Prof. Peter Wippermann, 61, is always far ahead of his time. The communications consultant and founder of Trendbüro in Hamburg has been researching the future for almost two decades now.



Sven Schulte-Rummel
Freelance journalist, Berlin

When he was 12, he stood in amazement at rally courses; today he prefers to do the driving himself. Automotive and technical editor Sven Schulte-Rummel, 33, loves racing at classic car events.



Katharina Hesse
Photographer, Beijing

Having studied Chinese and Japanese, she moved permanently to China. Katharina Hesse, 42, has worked as a photographer in Beijing for 17 years now.

Nele Justus
Freelance journalist, Hamburg

She loves nice things and writes about them too: Nele Justus, 31, enjoys good design, jazz and – ever since she spent time studying in Seville – Spanish cuisine. When she's not looking for new stories, she likes to go traveling. Her favorite destination is South America, and next time she's going to the Carnival in Colombia.



Record year 2010

Audi continues pattern of growth

In the past fiscal year the Audi Group displayed its international competitiveness impressively and achieved historic peak figures for production, deliveries and in all key financial performance indicators.

Deliveries to customers

The Audi brand achieved the strongest sales figures in its history in 2010. In all, 1,092,411 Audi cars were sold worldwide – an increase of 15.0 percent.

1.09 million cars

9.4%

Operating return on sales

The operating return on sales, at 9.4 percent, represents a new peak for the Audi Group. This once again places the Ingolstadt-based premium car manufacturer among the world's most profitable carmakers.

EUR 3.3 billion

EUR 35.4 billion

Operating profit

The Audi Group more than doubled its operating profit in 2010 to over EUR 3.3 billion. The Company achieved the highest profit from operating activities in its history and made further convincing advances in its quest for sustainable and profitable growth.

Revenue

The Audi Group increased its revenue in 2010 by 18.8 percent to a new record level of EUR 35.4 billion. The most decisive factor in this was the increase in worldwide demand for the Audi brand's attractive and efficient cars.

Net cash flow

With a net cash flow of more than EUR 3.5 billion, the Audi Group was able to fully finance the investment activities for current operations from the Company's own funds, as has been the case in recent years. The Company meanwhile achieved the biggest surplus in its history.

Employees

The Audi Group employed an average of 59,513 people worldwide in 2010 – more than ever before. Another 1,200 specialists will be hired in 2011, primarily for the areas of electric mobility and lightweight design.

59,513
EUR 3.5 billion

24.7%
EUR 2.1 billion

Return on investment

Return on investment, at 24.7 percent, significantly surpassed the previous record figure of 19.8 percent from 2008. This is further evidence of the Company's high profitability.

Investments

The Audi Group increased its total investment volume in 2010 by more than 16 percent to EUR 2.1 billion. The investments were focused primarily on new products and technologies of the future. At the same time, the largest investment program in the Company's history was adopted for the years 2011 to 2016.

Audi: the number one premium brand. This is the clearly formulated vision for the Audi Group.

It calls for Audi to assume worldwide leadership in the premium segment in the long term. To achieve this ambitious goal, the Company is focusing above all on delighting its customers. With expertise, passion and agility, Audi wants to win customers by offering the best brand experience along with innovative and emotional products. The plan calls for 1.5 million Audi brand cars to be delivered to customers in 2015. The Company is therefore intensifying its involvement in international automotive markets and is further developing its worldwide network of dealers and service centers accordingly. Aside from the United States, particular focus is on the growth markets of China and India. At the same time, the attractive product portfolio will be expanded to 42 models by 2015.

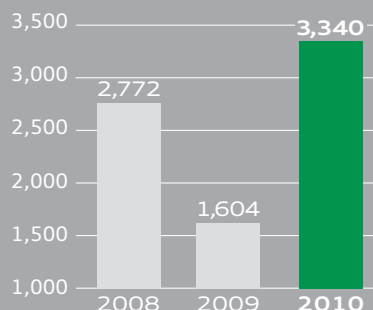
As part of the long-term model initiative, the Audi brand also again expanded its range in 2010 with several new arrivals. In addition to the new generation of the Audi A8 and the new Audi R8 Spyder*, the new A1 and A7 Sportback* models in particular have delighted customers with their emotional design, sporty handling, efficiency and a fun driving experience.

The newly introduced models already had a positive impact on the growth of total deliveries in 2010. The Audi Group increased deliveries of Audi brand cars to the new record

amount of 1,092,411 units. With a 15.0 percent increase, the brand with the four rings grew at an above-average pace in comparison with worldwide demand for cars. At the same time, the Audi Group's revenue rose by 18.8 percent to a new record amount of more than EUR 35.4 billion. As part of its qualitative growth strategy, the Audi Group is striving for sustainable, superior financial strength. In addition to stable revenue growth, the Company is primarily focusing on effective and efficient processes and structures, continuous optimization of costs and systematic investment management. The Audi Group more than doubled its operating profit in the past fiscal year and achieved a new record profit of more than EUR 3.3 billion from operating activities. With this, the operating return on sales also reached a new record level of 9.4 percent, after reaching 5.4 percent in the previous year, and once again secured the Audi Group's position among the world's most profitable car manufacturers.

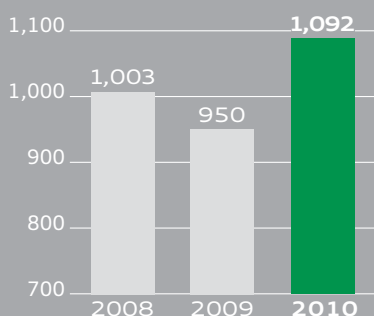
At the same time the Company once again displayed its impressive ability to self-finance. Although investments increased from the previous year, the Audi Group was able to finance these investments completely from its cash flow from operating activities. In the process, the Company actually achieved a significant surplus and increased net cash flow to more than EUR 3.5 billion. This also resulted in an increase in net liquidity to a new record amount of EUR 13.4 billion.

Operating profit
(EUR million)

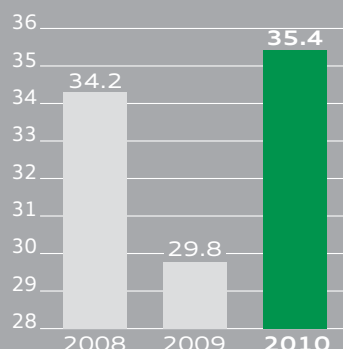


The 2010 fiscal year was another important milestone for the Audi Group on its way to becoming the world's number one premium brand – and the Company will continue to follow this path to growth in 2011. In addition to the successful market launches of the past year, the new generation of the Audi A6, the new Audi Q3 and other derivatives of the A1 model line in particular will stimulate additional demand. The Audi brand will also offer a full hybrid this year with the new Audi Q5 hybrid quattro*. The A6 hybrid and the A8 hybrid will follow at a later time, along with a small production series of the Audi e-tron supercar, which is powered solely by electricity. The Audi Group's plans calling for the biggest investment program in company history are primarily aimed at developing new, attractive products and advanced technologies such as hybridization and electric mobility. Over the next five years more than EUR 11 billion will be invested in achieving sustainable, profitable growth over the long term, and thereby becoming the world's leading car manufacturer in the premium segment. ●

Deliveries of Audi vehicles
(thousands)



Revenue
(EUR billion)





01-03

January 23 World class on the slopes

Audi presents the 2011 FIS Alpine World Ski Championships in Garmisch-Partenkirchen (Germany), and the 2013 event in Schladming (Austria). With these events the brand with the four rings is continuing to develop its involvement in international winter sports. Audi has supported three previous Alpine World Ski Championships.

January 27 Driving and presentation grounds planned in Neuburg

Audi is planning new driving and presentation grounds as well as a new development center in Neuburg an der Donau. Journalists will be able to inspect future Audi models on the premises, and customers can drive their new cars for the first time. A center for developing new, innovative driver assistance and passenger protection systems is also planned for the site.



March 3 One-of-a-kind driving experience

The Audi driving experience has expanded its portfolio. Since March 2010 Audi customers have been able to book exclusive races with the Audi R8 LMS at a partner. Audi was able to rely on the support of Joest Racing for this "race experience." The Audi racing team Joest recorded a one-two-three victory at Le Mans in 2010.

March 3 30 years of quattro

The quattro permanent all-wheel drive system celebrated its third decade in 2010. The first Audi quattro stood in the glare of the spotlights at the Geneva Motor Show on March 1, 1980. It was the start of a triumphant reign in motorsports and on the road. To date the quattro drive system has been delivered in more than 3.7 million Audi cars – currently, every third Audi coming off the assembly line is a quattro.



March 9 Special bonus for staff

Despite the financial crisis, AUDI AG again in 2010 paid out a profit-sharing payment as well as a special bonus of 1,200 euros to the 43,000 employees in Ingolstadt and Neckarsulm. This bonus honored the employees for their exceptional performance during the year of crisis in 2009.

March 31 Audi makes the most beautiful cars

In March 2010, readers of the car magazine AUTO ZEITUNG crowned Audi the "most beautiful brand" (8/2010 issue, p. 82). They could choose from the 50 best-selling car brands in Germany. The R8 Spyder* also contributed to the success of the Audi family during the premiere of the Design Trophy in 2010. It was named the "most beautiful convertible."



04-06

April 28**Audi has its own MedCup team**

For the first time since Audi became involved in the MedCup, in 2010 the carmaker sent its own boat to the regatta. The "Audi A1 Team powered by ALL4ONE," piloted by the renowned sailor Jochen Schümann, achieved several podium positions and took home seventh place following the final in the supreme TP52 class. In addition to lending its name to the race, the Audi brand also shapes the visual design of the series, handles hospitality services and supplies the shuttle vehicle fleet for each event with the latest models.

May 21**Audi is Germany's most popular employer**

Students graduating from engineering and business administration programs selected AUDI AG as Germany's most attractive employer in the renowned employer rankings compiled by the consulting institutes trendence (trendence Graduate Barometer 2010 – Business and Engineering Edition, May 21, 2010) and Universum (Universum Student Survey 2010 – Germany, May 3, 2010).

May 3**Audi participates in the National Platform for Electromobility**

In Berlin, German Chancellor Angela Merkel kicked off the National Platform for Electromobility. This is an initiative in which AUDI AG plays an active part, with Audi Board Member Michael Dick chairing the Standardization and Certification task force. The aim of the initiative is to develop Germany into a leading market for electric mobility.

**June 2****"travolution" improves efficiency**

In mid-2010 Audi presented the latest developments in the travolution project to journalists and traffic planners. Test drives demonstrated the current ability of cars to communicate directly with traffic light systems via WLAN and UMTS. With travolution, stop periods, acceleration phases and fuel consumption can be reduced.

**June 8****A1 experience at the airport**

Starting in June, Audi transformed the open area between Terminals 1 and 2 at Munich Airport into an Audi A1 experience. For five months, airport visitors were able to gather information and advice regarding the A1, or create and experience their dream A1 on a 3D configurator. A1 City was also the site for training 10,000 Audi sales representatives from all over the world.

07-09

July 21

A revamped quattro

To mark the 30-year anniversary of quattro at the Paris Motor Show, Audi presented the Audi quattro concept – a show car with a 300 kW (408 hp) turbocharged five-cylinder engine, a lightweight body and the latest generation of permanent all-wheel drive.



July 24

Audi Sportpark opens

The Audi Sportpark in Ingolstadt was opened with a blitz soccer tournament and an extensive program of events. This new venue offers room for around 15,000 spectators and is the new home stadium for FC Ingolstadt.

August 12

Green-powered railway transport

Audi is the first company in Germany to use trains powered by green electricity to transport cars to the loading port in Emden. Deutsche Bahn purchases the renewable energy additionally, and AUDI AG pays for any costs exceeding the price of conventional electricity. By using green electricity, Audi avoids emission of about 5,250 tons of CO₂ per year – more than 35 kilograms per transported car.



September 7

Chinese Audi customers highly satisfied

The range of services offered by Audi won over more Chinese customers in 2010 than those of any other premium car manufacturer. This was found in a study conducted by the J.D. Power market research institute. For the 2010 Sales Satisfaction Index, the institute surveyed Chinese new car buyers about their satisfaction with the contract negotiations, the sales process and competence of the sales staff.



September 29

Audi forms cultural partnership with Bavarian State Painting Collections

In September 2010, AUDI AG concluded a partnership with the Bayerische Staatsgemäldesammlungen (Bavarian State Painting Collections), thus adding an internationally prominent partner to its involvement in the arts. The Collections' holdings include some of the world's most famous museums, such as the Pinakothek galleries in Munich's Kunstareal art district, the Brandhorst Museum and the Schack Gallery.

2010

10-12

October 20

One millionth Audi in China

In the past fiscal year Audi celebrated selling its millionth car in China. A ceremony marking the occasion was held in Changchun and was attended by representatives of AUDI AG and of its partner First Automobile Works (FAW), along with more than 7,000 guests.



October 29

Audi A7 Sportback now at dealerships

The Audi A7 Sportback* celebrated its market launch in Europe in late October. The five-door car sets a new standard by combining the emotional character of a coupe with the prestige of a sedan and the functionality of an Avant. Also premiering was the Audi head-up display, which projects important information including navigation data on the windshield.

November 3

Two Golden Steering Wheel awards

Audi scored a double victory in the prestigious 2010 Golden Steering Wheel award: The A1 topped the small car category, and the A8 won the luxury car category (AUTO BILD, 44/2010 issue, p. 51). The Audi A7 Sportback took second place in the mid-size/full-size class to round out this excellent showing. With 20 Golden Steering Wheel awards, Audi is the most successful brand in the 35-year history of the competition, which is presented by BILD am SONNTAG and AUTO BILD magazine.

December 1

World premiere of the Audi A6

The new A6 was presented to the public for the first time in late 2010. In spring 2011 it will arrive at dealerships, bringing with it trend-setting solutions in every field of technology. Thanks to an intelligent combination of materials the car's body is unusually light, the controls are simple despite offering a wealth of functions, and a wide array of assistance and multimedia systems are included. In addition to conventional drive concepts, a hybrid version of the new business sedan* is also planned.



December 27

Largest investment program in company history

Audi wants to grow further. The Company provided proof of this intention by announcing the largest investment program in its history: Between 2011 and 2015, more than 11 billion euros will be invested primarily in new products and technologies and also on extending the production sites. Furthermore, Audi is planning to hire some 1,200 new specialists in 2011.

2011 Financial Calendar

Quarterly Report, 1st quarter

May 2, 2011

Annual General Meeting

May 12, 2011

Audi Forum Neckarsulm

Interim Financial Report

July 29, 2011

Quarterly Report, 3rd quarter

November 2, 2011



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