

# FRANKFURT INTERNATIONAL MOTOR SHOW

## DVN Report

—— The 68<sup>th</sup> Frankfurt Motor Show ——

**IAA**

12-22 September 2019



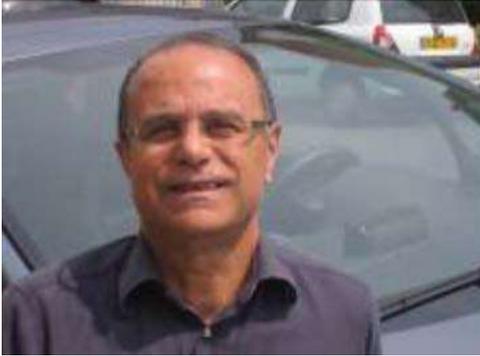
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THE END

## About the authors

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Hector Fratty's entire career has been in automotive lighting. From 1995 to 2006, he was Valeo Lighting's chief of R&D. His level of expertise in lighting gained him recognition as one of Valeo's five Master Experts. In 2008, he initiated the launch of his own company, Driving Vision News, which has become the automotive lighting and driver assistance industry's journal of record dedicated to keeping the community informed and communicating about the latest progress and developments.

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Patrice Minol studied automotive design at the International School of Design. He discovered the world of lighting during an internship at Valeo Vision and he's now working at Jaguar design. His passion for photography combined with his design approach allowed him to work with DVN as a reporter at auto shows since 2012.

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## **IAA Frankfurt**

At the 68th IAA Frankfurt motor show, held from 12 to 22 September, the VDA (German Association of the Automotive Industry) have given the event a new look and feel. VDA President Bernhard Mattes likens the show's transformation to that of the auto industry itself: «Automotive companies will meet new digital players. The IAA is becoming more interactive, more connected, and more digital. Trends and topics will be presented and discussed by representatives from many sectors.»

Though a surprising list of marques were absent from the show, IAA still sparkles with interesting cars and technologies.

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## Seven main takeaways from Frankfurt

### **IAA IS CHANGING :**

From an exhibition to a broader-based, more interactive platform with auto manufacturers, tech companies, suppliers, mobility service providers, and startups.

### **MANY AUTOMAKERS SKIPPED THE EVENT :**

Including Alfa Romeo, Citroën, and DS, Ferrari, Fiat, Infiniti, Jeep, Kia, Lexus, Mazda, Nissan, Toyota(!), and Peugeot.

### **BIG FOCUS ON CLEAN-CAR TECHNOLOGY :**

Clean-running engines, electrics, and hybrids. Most of the promotion and communication is focused on EVs. Automakers are facing tighter emissions regulations in Europe, and will have to pay huge penalties for violating the 95 g/km CO2 limit starting next year.

### **GERMAN AND CHINESE AUTOMAKERS ARE ON TOP OF THEIR GAME :**

More than half of the enormous show space is dedicated to German companies like the VW Group, Mercedes-Benz, and BMW. These companies also had the biggest presentations of high technology. And a notable 10% of exhibitors are Chinese—mainly with new EVs.

### **NO COMMUNICATION ON LIGHTING :**

This time around, nobody wants to talk up the technology or performance of their lighting systems! Audi present their matrix lights in a showcase, but other than that, there seems to be no effort to give ADB the marketing and education push it deserves.

### **DOT-LIGHTING FOR CONCEPTS; MODULE-LIGHTING FOR PRODUCTION CARS :**

We're seeing more and more lighting modules in production cars—not surprising, since modularisation is a cost-effective strategy—but fewer modules in concept cars where modules used to predominate. Now, most concept cars have dotty LED arrays, perhaps as a placeholder to telegraph «Coming soon: this car will have LEDs!».

### **INTERIOR LIGHTING'S DAY IS HERE :**

As interior lighting innovations are presented mainly in concept cars. Here again, German brands like Mercedes and BMW are assertively pushing ahead on this front, though they're certainly not alone.

## A4 & S4

Audi have remade their successful A4-S4. Its exterior presents with the brand's new design language, including stripe-shaped lights. Three lighting systems are offered, all of which feature LED technology, though not for every front light and signal function in the basic-equipment system. The first option includes the LED headlamps, but with upgraded signature daytime running lights, additional functions such as freeway and intelligent cornering lights, and sweeping rear turn signals. In the upper part of the headlamps, one long and five short light lines make up the contour of the daytime running lights.

The top-specification system has matrix LED headlamps, sequential turn signals both rear and front, cornering lights, and an animated dancing-light function for welcome/farewell. Their ADB is provided by eleven LEDs behind a lens in each headlamp which, just like the adjacent low beam modules, have the appearance of an eye. The control unit can switch them on and off or dim them as necessary so that the matrix LED headlamps always illuminate the road brightly without blinding other road users. When the car is locked and unlocked, dynamic light animations play in the headlamps.



The rear lights are likewise available in three versions, all in LED. With the first option comes sequential turn signals and rear position lights providing a signature keyed to the motif of the daytime running lights. The second option adds welcome/farewell animation to go along with those in the headlamps.



## A5 & S5

The A5-S5 cars now feature a new look with redesigned lights.

All models come with LED headlamps as standard equipment. Matrix LED headlamps and sequential rear turn signals come with the first option. The top-of-the-line lighting system has matrix LED headlamp, a laser high beam booster, and the tail lights get animated-light capability.







**Audi**

### Q3

This coupé-shaped small SUV is new to Audi's range. The front light is wrapped around the frame grille with the signature dual underslung modules, a characteristic of the Audi SUV family. Here again, there are three lighting systems topped by a matrix LED ADB system.



The reversing lights contribute to the wide stance of the car; they run inwards in a tapered shape, just like the headlamps.





**Audi**

## Q7

Audi are showing an extensively updated Q7, with a great deal of new design and technology. The headlamps, optionally in HD matrix LED technology with laser booster, have a contour and light signature that give presence and gravitas to this full-size model.



At the rear is a striking chrome strip connecting the horizontal rear lights, with their technical-looking graphics.





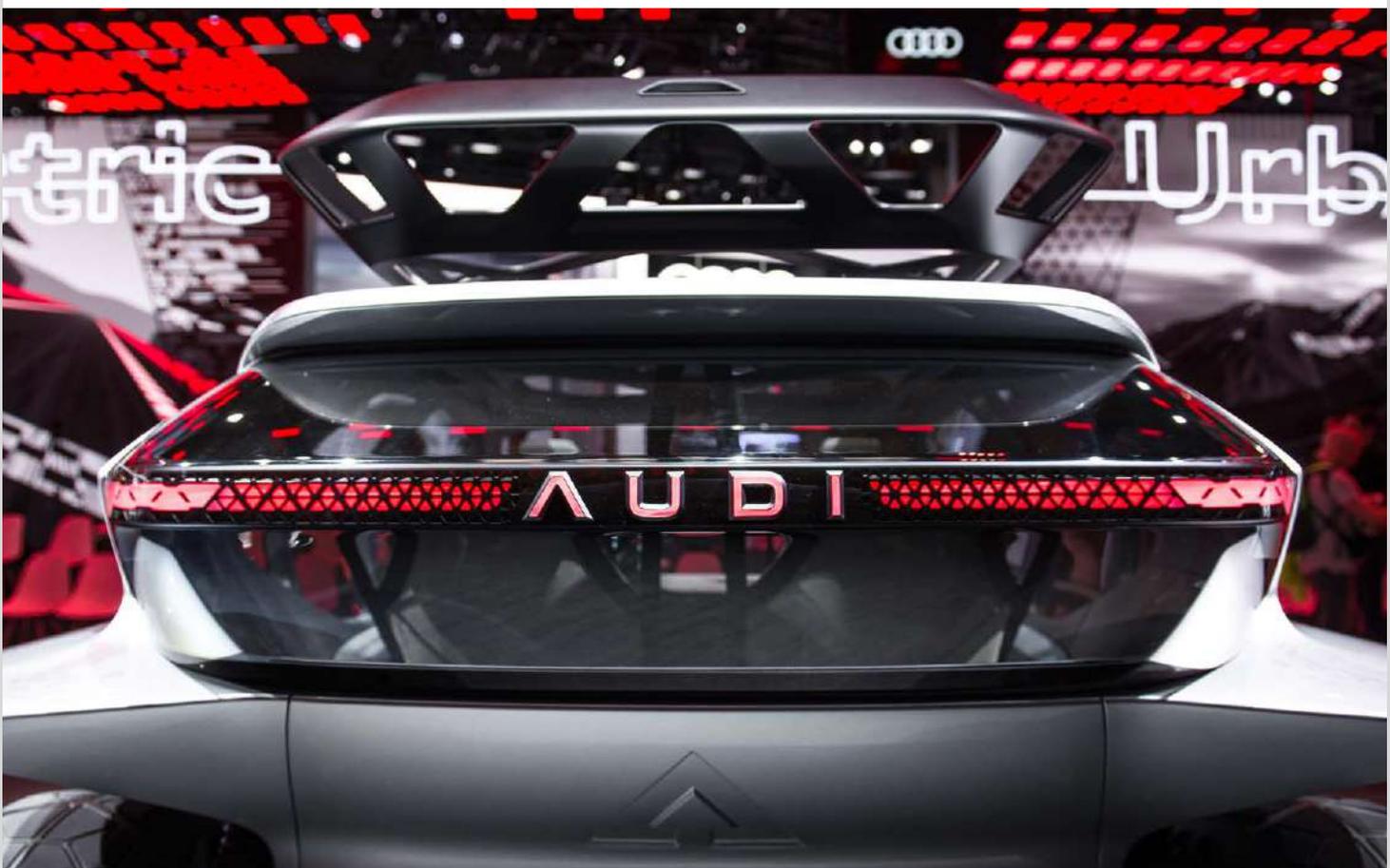
**Audi**

### **AI:Trail Quattro concept**

The four-seater AI:Trail Quattro combines the capacity for automated driving with off-road capabilities. Mobility and multifunctionality are features of the lighting system, too; instead of conventional headlamps, self-contained light sources sit below the A-pillars and can shine both outward and inward. These LED elements are dimmable and adjustable and can be used as interior lighting as well as for lighting the vehicle's path.



The rear lights operate in a similar way. Extending across the full width of the rear section, this element can be used to illuminate the luggage compartment and as distinctive signature lighting for the exterior. Instead of conventional low beams and high beams, the vehicle is equipped with five rotorless electric drones with integrated matrix LED elements. They can land on a roof rack or directly on the roof of the vehicle, and docking onto the inductive charging elements.





## 1-Series

The new 1-Series brings some new approaches to BMW's long tradition of asserting brand identity via light signature. The newly-slanted headlamps give the car a youthful appeal which also sets it apart instantly from BMW models higher up the range. In the base version of the car, halogen headlamps and the LED DRLs below them form the customary BMW four-eyed face. The optional full-LED lights, which can also be specified with adaptive functionality, have a particularly modern appearance. The transparent, hexagonal tubes of the DRLs lend a certain technical precision to the four-ring look. Eyebrow turn signals emphasise the width of the car, and create depth with the set-back headlamp tubes. A brushed aluminium element occupies the upper part of the headlamp unit underneath the cover lens, and there's a **BMW LED** callout.



The full-LED rear lights, available as an option, provide an all-new interpretation of the familiar «L» shape. This takes the form of a single, slim light element with a distinctive side upsweep. Concealed around this element under the red cover lens are the direction-indicator, brake and tail lights, reversing and rear fog lights. The basic version of the rear lights presents a similar look using incandescent bulbs.





## X1

The newly-updated X1 reflects BMW's confidence in the model. The new LED headlamps are notable for their sharper light iconography. The front bumper now displays an even more dynamic use of forms, and it has integral LED foglamps



The optional LED rear lights likewise have a new design, a single LED bar drawing the familial «L» signature from side to side. The horizontal design of the LED rear lights also visually emphasises the car's wide stance. on the road. The X1 can be had with an upgraded operating system including a control display up to 26 cm, a multitude of cutting-edge driver assistance systems, and an extensive range of digital services from BMW ConnectedDrive.





## X6

The third-generation X6 makes good use of light styling to project a confident, commanding appearance.

The characteristic twin headlamps—LEDs are standard—extend up to the familial kidney grille and emphasise the presence and width of the car. If the optional adaptive lights with laser booster are specified, Selective Beam optimises the glare-free high beam function such that its range increases to around 500 metres. This optional extra can be identified by the blue x-shaped elements which split up the hexagonal light sources inside the headlamps—like X-Wing fighters from Star Wars!



The rear of the car is accentuated by the wide L-shaped LED rear lights.





## M8

The M8 has the most powerful engine ever developed for a BMW M car. And it's got lights to match:

The slim twin headlamps on either side of the signature kidney grille lend an aggressively focused air to the BMW familial look. All M8s have adaptive LED headlamps which provide the low beam, high beam, and DRL functions all from both light tubes.



There is also the option of BMW's laser high beam booster with BMW Selective Beam—that's standard equipment in Germany—which generates a high-beam range of up to 600 metres. As well as a BMW Head-Up Display with M-specific readouts, the M8 also comes with Driving Assistant and Parking Assistant as standard fitment, with an array of further driver assistance systems available as options.





## iNext Concept

Here's BMW's day-to-day work on display, answering the broad question of how we'll be moving around in the future. The Vision iNEXT builds resolutely on the idea that first took shape in 2007 with «Project i» and evolved into the launch of the BMW i3 in 2013.

The all-electric BMW Vision iNEXT mainly serves as a showcase for the EASE experience concept, illustrating how autonomous driving is set to transform life on board vehicles. A 3D-printed pattern points to the technology below the surface. Super-slim headlamps are part of a modern interpretation of BMW's signature four-eyed front end.



The windscreen extends smoothly into a large panoramic roof, lending the rear of the car a visual lightness and ensuring the innovative interior is clearly visible from the outside.





## Concept 4

BMW unveiled their new Concept 4 here at IAA. It's a future-focused interpretation of the BMW Group's coupé tradition.

The slim twin headlamps are slightly angled and team up with the giant kidney grille to lend the front end a modern look with a strong brand identity. The striking LED light elements have no cover lens; instead they are worked into the body like three-dimensional sculptures. This allows them to bring an even greater sense of modernity and technical sophistication to the front end.



The LED rear lights consist of a single fibre-optic element in each lamp, which lends the familiar BMW L shape a heartbeat-like graphic and also dispenses with cover lenses. Their contours underscore the sportingly horizontal focus of the rear end and accentuate its brawny stance on the road.





## M-Next

And here's a BMW answer to how driving pleasure might look in the future for those who enjoy taking the wheel themselves.

The headlamps debut «Laser Wire» lighting technology, wherein glass fibres coated with phosphor are used to produce headlamp elements with a new, super-slim and extremely precise form. The rear lights feature the same Laser Wire technology. Their cover lenses frame the rear end in a sweeping flourish on either side. Inside each light unit, a single wafer-thin glass fibre produces an abstract ECG trace of a heartbeat fashioned with pin-sharp precision. The two-dimensional reinterpretation of the distinctive pair of BMW roundels from the BMW Turbo and BMW M1 gives them the impression of floating in the rear lights' transparent lenses.



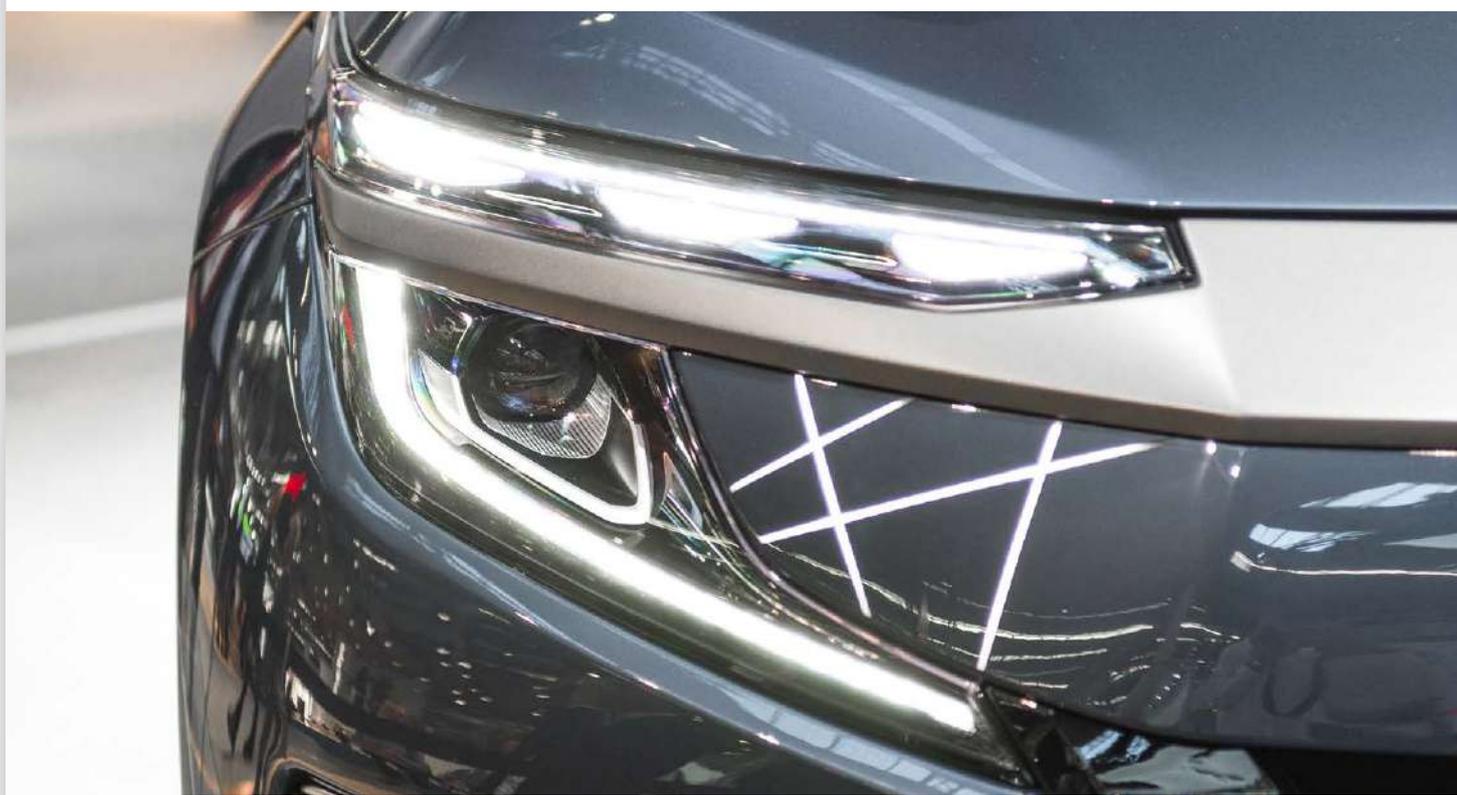


## Byton M-Byte

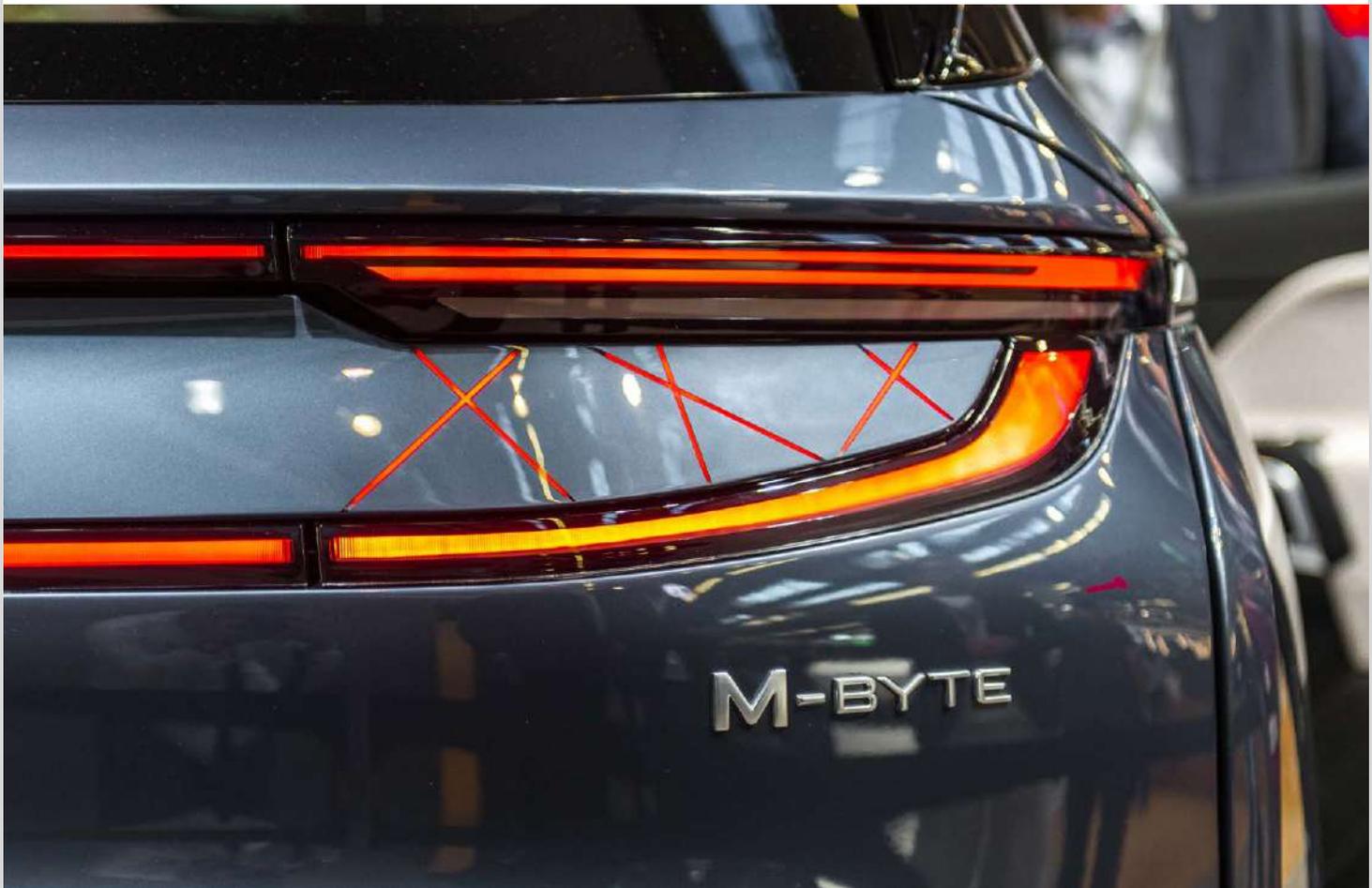
Byton presented the series production version of the M-Byte, after some years of showing prototypes. The first deliveries to customers in China are slightly behind schedule and will begin in mid-2020. In Europe and North America, the company's debut is slated for 2021.

Lighting elements transform the front and rear of the car into a sort of «external user interface», as Byton call it. In the era of autonomous driving, this is intended to serve, among other things, for communication with the outside world.

On the headlamps, the upper DRL is split with the functions positioned in the lower section.



At the rear, a full-width rear light with cross detailing in the body shape makes the car look wider than it is.





## Puma

Ford unveiled their new Puma, an SUV-inspired compact crossover boasting best-in-class load space and sophisticated mild-hybrid powertrain technology.

The expressive front end features intricately designed, canoe-shaped LED headlamps that sit high on the wings, while the LED fog lamps are positioned directly below, integrated into the front air curtain inlets that guide airflow across the front wheels to reduce turbulence for improved aerodynamics.







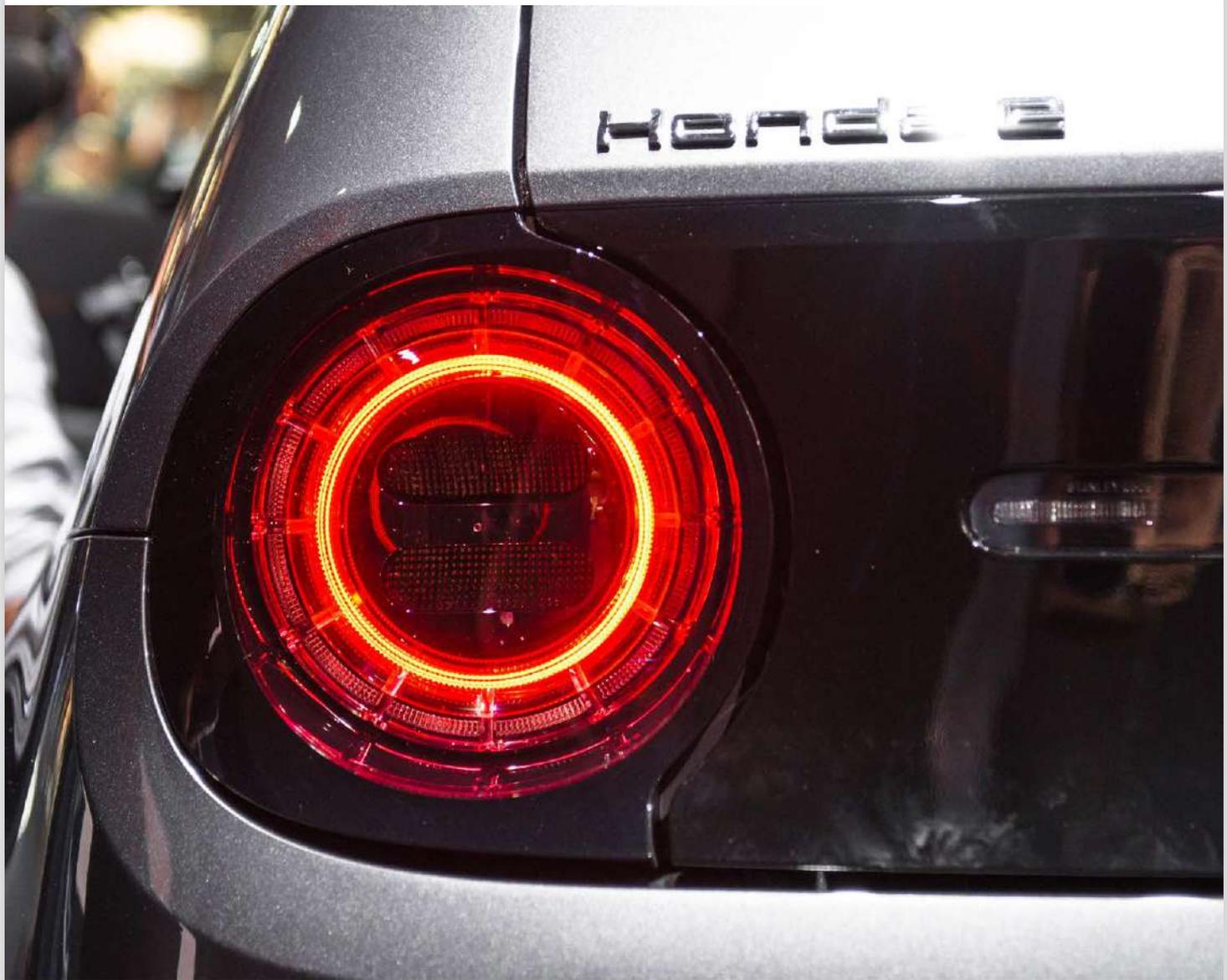
**HONDA**

e

Honda's e is the first production battery electric vehicle launched by Honda in Europe. It's the next step towards Honda's intent for 100% of their European-market models to be electric by 2025.

The exacting attention to detail of the round headlamp clusters enhances the overall simple, clean design and defines the Honda e Prototype's human-face appeal. The production version is strikingly similar to the concept car covered in the 2019 Geneva auto show DVN Report.





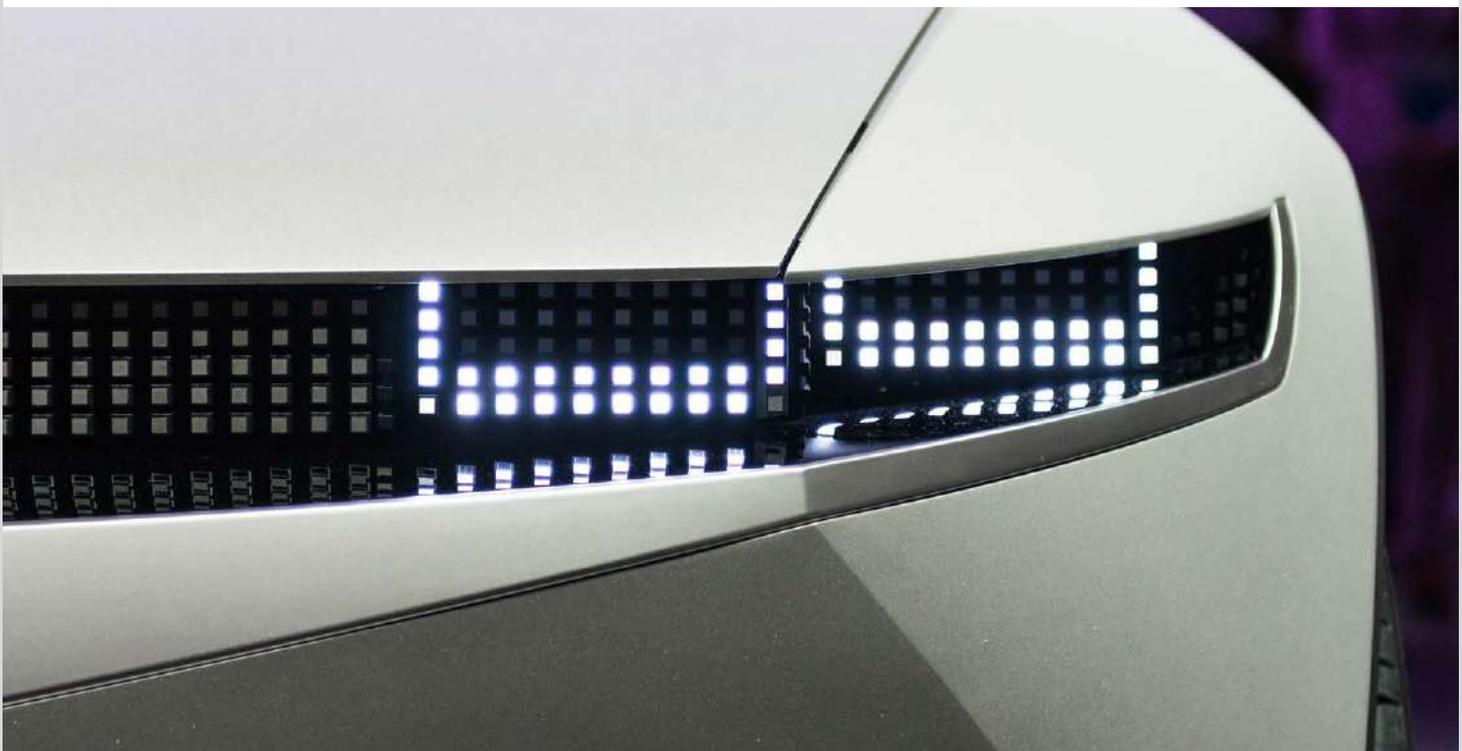


45

As an homage to its heritage, the 45 presents a new era of Hyundai's automotive design focused on electrification, autonomous technologies, and intelligent design.

The 45 reinterprets the concept's distinctive lattice radiator grille with a 'kinetic cube lamp' design. It shows a great increase in Hyundai's lighting brand-identity—people will instantly recognise this vehicle at a distance.

New lights herald EV technology in the 45's design. At the bottom of the door, a special garnish highlights its long-distance battery capability and, through active LED lights drivers can intuitively know how much longer they can drive even before they get in the car. These thoughtful elements are designed for a user who is experiencing an EV for the first time.







## i10

Showgoers at the IAA got the world's first glimpse of the new i10, set to launch for sale soon.

Its wide front grille expresses a sporty character and incorporates the round LED Daytime Running Lights showing a refined honeycomb structure, thus continuing this feature of the i10's heritage. At the rear, two horizontal crease lines break up the soft surfaces of the boot and run into the taillight graphics.







## Sian

Lamborghini unveiled their Sián, a hybrid super sports car delivering new technologies and unsurpassed performance.

The low front with integrated carbon fibre splitter is dominated by the dart-shaped headlamps, used for the first time to reflect the signature design of the night lights originally designed for the Lamborghini Terzo Millennio.



The outré rear of the car incorporates the hexagonal design so linked with Lamborghini, including six hexagonal tail lights inspired by the Countach.



## Defender

Here's an icon reimagined for the 21st century. The Defender's characterful front leads with the geometric forms of its highly technical LED headlamps with the latest adaptive technology.



At the rear the geometric forms of the distinctive high-tech lamps harmonise perfectly with the front end design.





## GLB

The GLB has powerful proportions with short overhangs and an off-road-orientated design. The LED high performance headlamps and Multibeam LED headlamps are available as an option. These allow extremely quick and precise, electronically controlled adjustment of the headlamps to suit the traffic situation. LED fog lamps are also available.







## EQC Concept

Seamless integration of the lights makes the Vision EQS into a communicative vehicle, a «coöperative» car. The 360-degree exterior lightbelt, the digital LED matrix grille, and the Digital-Light headlamps allow interaction between the vehicle and its surroundings.

The black-panel grille, which has been realised with several levels as a world first, provides a new level of precise signalling. Its light matrix consists of 188 circuit boards, each of which carries 5 individually actuated LEDs and a single star. With this total of 940 individual LEDs in a three-dimensional space, the light signals the vehicle communicates with create a fascinating impression of depth. The lightbelt traversing the grille also indicates membership of the EQ product family.

The Digital Light headlamps each have four lens modules. Once the black panel comes to life, the seemingly free-floating stars and pixels create a holographic effect of floating light modules.



In the process, they rotate at well over 2000 rpm. This high rotative speed suggests a static image to the human eye (due to persistence of vision), and with specific actuation it even allows individual holographic images to be generated. The main module and circuit boards become practically invisible, causing the 500 LEDs per headlamp to appear to float in space. As each of the high-performance, sub-millimetre LEDs is actuated individually, and can rotate at three different levels, the floating 3D impression is additionally reinforced.



## Cooper SE

The MINI Cooper SE gets LED headlamps as standard equipment. The main function is placed in the middle of the light, surrounded by the iconic MINI circle signature for the DRLs—note the half-circle auxiliary front position/DRL lights below the bumper.



The rear lights also feature a new design: as a clear reference to the brand's British origins, a Union Jack flag motif is recreated in the structure of the light functions. The turn indicators are horizontally arranged and the brake lights are vertically aligned, with the tail light additionally representing the diagonal lines of the British flag. In order to ensure a particularly harmonious lighting effect, all light sources forming the Union Jack graphic use LED technology.





## Corse-e

Opel goes electric: the new, sixth-generation Corsa is offered for the first time as a battery-electric.

Technologies and assistance systems more often found in higher market segments show up in the Opel Corsa-e. The top features include the adaptive, glare-free IntelliLux LED® matrix light that Opel offers for the first time in the small car segment. The eight LED elements, controlled by a newest-generation high-resolution front camera, continuously adapt the light beam to the prevailing traffic situation and the surroundings. Advanced driver assistance systems provide tangible additional safety. The new front camera lets the car's traffic sign recognition system see additional information, such as LED signs. Speed limits saved in the system are also shown in the display.







## Astra

The Astra already offers a portfolio of state-of-the-art technologies and assistance systems that is unrivalled in this vehicle class—notably the intelligent, glare-free IntelliLux LED® matrix light.



The rear lights bear a boomerang-inspired shape integrated in the quarter panel and tailgate.



## Taycan

Porsche's four-door sports sedan has LED matrix headlamps forming a visual unit that seems to float. The brand-signature four-point daytime running lights are flatter and wider than on any other Porsche. Produced with three-dimensional glass elements, the result is a striking sports car look with a unique light signature. All the light functions are, for the first time, integrated in one module.

segments of the permanent high beam cone in a targeted way. 84 individually controlled LEDs can be adjusted so other road users are kept out of the glare, though the areas in between and next to them continue to be fully illuminated. These LED matrix headlamps with PDLs Plus are also optionally available in a special version from Porsche Exclusive Manufaktur, with a three-dimensional circuit board graphic in the headlamp housing.



The Porsche logo made of three-dimensionally shaped glass-effect letters is located in this. Too, there are daytime running light elements in Glacier Ice Blue. With these, the headlamps appear to be in this colour from certain viewing angles.



## el-born

SEAT's el-Born is a concept car that answers the array questions posed by the electric revolution.

The headlamps hew to SEAT's signature triangles-and-sharp-lines signature, with a layering of pattern inside the light matching the exterior of the car.



The rear lights are a full-width strip with triangle shapes and fading mesh pattern, the same pattern used for the front reflectors.



## Cupra Tavascan Concept

After unveiling the CUPRA Formentor concept earlier this year, SEAT are taking the next step toward their vision of electrified performance with the CUPRA Tavascan concept.

The vehicle's front design emphasises its electric personality with an illuminated CUPRA logo that sits low, providing a fascinating focal point. The headlamps retain the company's triangular signature with 3 stripes underneath.



The rear lights comprise full-width stripes incorporating 3 triangular thin floating surfaces. SEAT have put attention to the details with a nice pattern on the triangular surfaces.



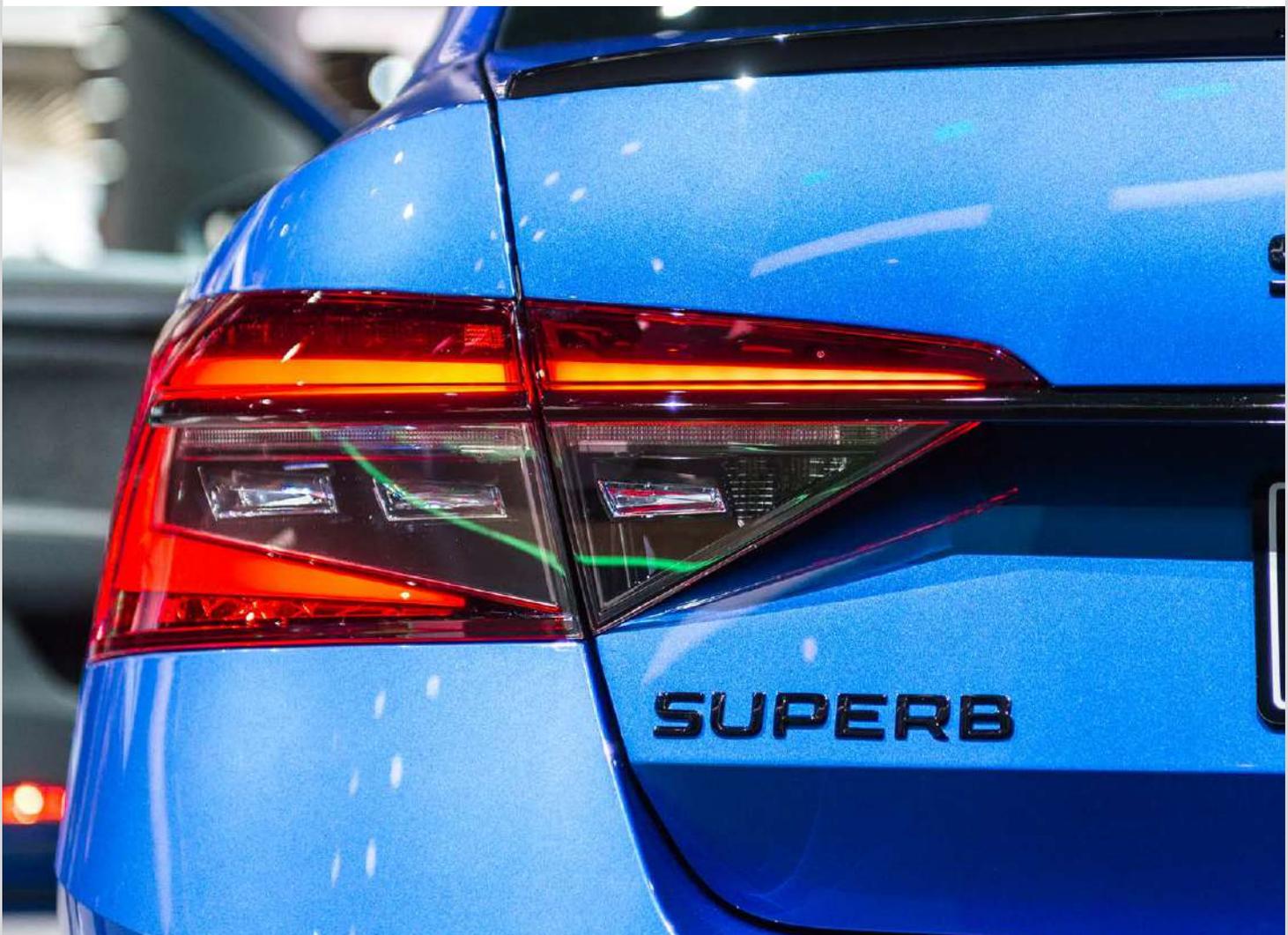


## Superb iV

This is Škoda's first production model to feature plug-in hybrid technology. It has full LED matrix ADB headlamps—the first in a Škoda production car.



The full LED tail lights come with dynamic rear indicators that illuminate in an outward sweeping motion, not only making the signal even easier to see and more noticeable, but also creating additional dynamics.





### ID.3

Volkswagen launched their much-ballyhooed era of environmentally-friendly mobility with the fully electric ID.3. Displaying VW's philosophy that light is the chrome of the future, the vehicle uses LED lighting in multiple areas to define, present, and project the car's design.

Interactive matrix LED headlamps have a light output of 750 lumen and Dynamic Light Assist main-beam control: a camera on the windscreen analyses road users ahead as well as oncoming traffic. On the basis of this data, the glare-free high beam automatically switches on at speeds over 60 km/h. And when drivers approach a parked ID.3 1ST, its headlamps will briefly look at them and «flutter its eyelids»—a friendly human touch.





## VV7

The original design elements of China's upstart Wey luxury brand endow their VV7 with a fashionably dynamic appearance.

The car has the innovative design of vertical daytime running lights, front fog lights, high brake lights, rear position lights, rear fog lights and rear reflective strips. Through the LED light sources and light band, the car creates a soft textured vertical light.





## S Concept

The car has a clamshell-shaped three-dimensional engine compartment cover and sharp quadrilateral light-sword LED headlamp, and is also equipped with a closed front grille, so we can reliably guess that the new car will be a pure electric SUV.



The rear lights present a 3-tooth signature like the DRLs up front.



# X

Previously shown at the Shanghai motor show, the Wey X is a concept with level 5 autonomy. Being able to communicate with the road users was one of the main intentions with this concept, and via the front grille and rear tail gate the concept is able to show messages and deliver safety information.





Car makers

Aston Martin, UK  
 Audi, Germany  
 Bentley, UK  
 BMW, Germany  
 FCA, USA  
 Daimler, Germany  
 Ford, Germany  
 GM, USA  
 Great Wall, China  
 Harley-Davidson, USA  
 Honda, Japan, USA  
 Hyundai Motor, Korea, Europe  
 Jaguar-Land Rover, UK  
 Mahindra Mahindra, India  
 Nio, China  
 Nissan, Japan, Europe, USA  
 Opel, Germany  
 Porsche, Germany  
 PSA, France  
 Renault, France  
 SAIC TC, UK  
 Shanghai-Volkswagen, China  
 Seat, Spain  
 Skoda, Czech Republic  
 Toyota, Japan, Europe, USA  
 Volkswagen, Germany  
 Volvo Cars, Sweden

Univ, labs, Consultants

Andaltec, Spain  
 Darmstadt university, Germany  
 DEKRA laboratory, Nederland  
 FEP, Franhauser, Germany  
 Fudan university, China  
 GranStudio, Italy  
 Hannover Leibniz Univ.(HOT), Germ.  
 Institut d'Optique, Fr.  
 Karlsruhe Lighting Institute, Germany  
 LAB, France  
 Light Sight Safety, Belgium  
 Nuremberg university, Germany  
 Pacific Insight, USA  
 Parma university, Italy  
 Rensselaer university, USA  
 SLD Laser—formerly SoraaLaser  
 UMTRI, USA  
 University of California, Santa  
 Barbara  
 YoungNam University, South Korea  
 Mr Shunxing Wang, China

Set Maker

AL, Germany, USA  
 Bee Lighting, UK  
 Denso, Japan  
 Elba, Romania  
 Farba, Turkey  
 FIEM Industries, India  
 Flex'N'gate, USA  
 Grakon, USA,  
 Grote, USA  
 Hascovision, China  
 Hella, Germany  
 Hyundai IHL, Korea  
 Ichikoh, Japan  
 J.W. Speaker, USA  
 Koito, Japan, Europe  
 Lear, USA, Europe  
 Lite-On, Taiwan  
 Lumax, India  
 Magna, USA, Austria  
 Mind Optoelectronics, China  
 Mobis, Korea  
 NAL, USA  
 Neolite ZKW, India  
 Nordic Lights, Finland  
 Odello, Germany  
 Olsa, Italy  
 Plastic Omnium, France  
 Peterson, USA  
 Rebo Lighting, China, Germany  
 SL Corporation, Korea  
 Stanley, Japan  
 Tianchong, China  
 Truck-Lite, USA  
 Valeo, France, Spain, China  
 Varroc, Germany, Czech R.  
 Xingyu, China  
 ZF-TRW  
 ZKW, Austria  
 Zodiac, France

Light source suppliers

Anrui Opto, China  
 Diodes Dynamics, USA  
 Dominant Opto Tech., Malaysia  
 Everlight Electronic, Taiwan, Germ.  
 Excellence Opto Inc., USA, Taiwan  
 LG Innotek, South Korea  
 Lumileds, Netherlands  
 Nichia, Japan  
 Osram, Germany  
 Samsung Electronics, Korea  
 Seoul Semiconductor, Korea  
 Soraa Laser Diode, USA  
 Tungsram, Hungary  
 Vosla, Germany

Lighting Suppliers

3M, USA  
 A2Mac1, France  
 AML Systems, France  
 Aspöck Systems, Germany  
 ASYST Technologies, USA  
 Auer-Lighting, Germany  
 Bicomoptics, China  
 Bühler Alzenau, Germany  
 Covestro, US, China, Europe  
 Dajac, USA  
 DBM Reflex, Canada  
 Delvis, Germany  
 Docter Optics, Germany  
 EcoGlass, Czech Republic  
 Elmos, Germany  
 Enmech-Mektec, Germany  
 GXC Coatings, Germany  
 Holophane, France  
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 IMS, Netherland  
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 Instrument Systems, Germany  
 Jenoptik, Germany  
 Keboda, China  
 LG Electronics, South Korea  
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 Luminit, USA  
 Lumitex, USA  
 Maxell Joei Tech, Japan  
 Merck, Germany  
 Mentor Graphics, Europe, USA  
 Mitsubishi Electric, Germany, Jap.  
 Myotek Industries, USA  
 Nalux, Japan  
 NXP, UK  
 ON Semiconductor, Europe, Asia, US  
 Optis, France  
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 Red Spot, USA  
 Sabic, USA  
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AL company profile  
DRL, brand signature  
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China lighting market  
The Wonderful World of Passenger Car lighting Regulations  
Tier 2and3 contribution on automotive lighting  
ZKW company profile  
Simulations in automotive lighting  
Mercedes-Benz profile  
LED technologies in Automotive Head lighting  
LEDs Thermo-Electrics  
Interior Lighting  
BMW and lighting  
Lighting and Driver Assistance  
OLED technology  
Materials in lighting  
Laser Head lighting  
Korea Lighting Market  
SL Corp profile  
ADB/Matrix Beam  
J.W. Speaker Profile  
2015 Geneva Auto Show  
ADAS and Lighting  
India Car Industry and Lighting Market  
Advanced Motorcycle Lighting  
IAA Auto Show 2015  
ISAL 2015  
Peterson Manufacturing  
NAIAS Auto Show  
Delhi Auto Expo 2016  
DVN Delhi workshop  
Geneva Auto Show 2016  
Vision of lighting 2025-2030  
DVN Tokyo workshop  
Automotive lighting Regulations worldwide  
New ADB technologies  
Mondial Paris Auto Show  
VISION Congress Vehicle Lighting in USA  
Peterson Manufacturing  
NAIAS Auto Show  
Delhi Auto Expo 2016  
DVN Delhi workshop  
Geneva Auto Show 2016  
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DVN Tokyo workshop  
Vehicle lighting Regulations worldwide  
New ADB technologies  
Mondial Paris Auto Show  
VISION Congress Vehicle Lighting in USA

## 2017 Reports

NAIAS autoshow  
DVN Rochester workshop  
Geneva autoshow  
Simulation Tools  
Shanghai autoshow  
DVN Shanghai workshop  
Interior Lighting  
Israeli Startups  
IAA Frankfort autoshow  
ISAL symposium  
Jaguar Land Rover and lighting

## 2018 Reports

NAIAS and CES Auto Shows  
DVN Munich Workshop  
Geneva Auto Show  
Engineering companies in lighting  
Japanese lighting market  
DVN Tokyo Workshop  
Camera technologies  
Varroc profile  
Mondial Paris Auto Show  
Vision congress  
Volkswagen profile

## 2019 Planned Reports

LA and CES .....29 January  
Geneva autoshow.....19 March  
Volkswagen profil.....2 April  
Shanghai Autoshow.....7 May  
Materials in automotive lighting...2.....8 May  
Status of w/w Regulations.....18 June  
The future of Exterior Lighting.....23 July  
IAA Frankfort Autoshow.....17 September  
ISAL.....15 October  
Automotive lighting in US.....12 November  
Interior lighting.....10 December

