

## Editorial

### Good Achievements, Bad Communication

This year, as usual, I took great pleasure in visiting the IAA Frankfurt motor show last week. It is a good opportunity to talk with colleagues and associates in the lighting world while viewing a new model or a concept car. I only regret this year so many brands decided not to participate in the motor show.

About lighting, I was disappointed by the weak presentations on new lighting functions. Of course there's no real need to promote light styling innovations, because they promote themselves—lighting is, and will remain, one of the main styling features to make the difference, whether it's innovative DRLs, front and rear position lights with a brand-specific shape, or any of the other grand lighting flourishes designers are treating us to.

But we certainly must promote innovations in function! That doesn't happen on its own; the car buyer usually doesn't see the added value of new lighting functions before driving at night, and most buyers don't test-drive cars after dark. So they remain uninformed or indifferent. This is not good enough; we have to front-load the communication about lighting to entice buyers to try out the lights at night—or at least to go into the carbuying process with a reasonable amount of knowledge about their options for good seeing and conspicuity at night.

We have achieved, with ADB's glare-free high beam, what can legitimately be called the most significant innovation in vehicle lighting in the last century; we should be shouting it from the rooftops with trumpet fanfares! Yet at IAA, absolute silence from the automakers (except Audi's showcase). Nothing from lighting suppliers visible to the public, either; they only let automakers into their confidential displays.

So how could we promote lighting under these conditions? Of course we cannot, so I have an urgent message I lay at the feet of all industry players reading this: automakers and lighting suppliers, you really must promote your biggest innovations directly to the public. Go on TV, go on social media, go on YouTube, go to all the media explaining what is ADB, how the equipped driver gets high-beam seeing while exposing others to only low-beam glare, and without having to remember to change between low and high beam. Tell them about the huge extra seeing distance at night, and what this means for preventing crashes and pedestrian hits!

In this week's DVN we present a great many innovations done by you—why are the end-users not being informed? This is my main regret in DVN, that I have so far not been able to convince you to promote your wonderful achievements.

Sincerely yours

*DVN President*



## In Depth Lighting Technology

### IAA Frankfurt Motor Show: A Study in Contrasts



IAA is always a giant cornucopia. Here we present seven takeaway points and highlights of some notable production and

concept cars, but it's just a taste; for the full spiel, don't miss our [DVN Report published this week](#).

At the 69th 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.

### **Seven key takeaways**

- **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.

### **Highlights and spot checks from DVN's walk of the show**

#### **Audi Q3**



The reversing lights run inwards in a tapered shape, just like the flat headlights.

Audi supplies the latter in three versions up to Matrix LED technology which intelligently illuminates the road as best suits the driving situation.

#### **Audi A5**



All A5s come with LED headlamps as standard equipment. The top-spec system includes matrix LED headlamps and a laser high beam booster, LED rear lights with dynamic turn signals and dynamic light sequencing. The equipment line concept is also new.

#### **BMW Vision I-NEXT**



The BMW Vision I-NEXT represents a prototype version of the BMW driving experience of tomorrow. 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.

The I-NEXT and the M-NEXT also show how the DRL will be in the future on the BMW vehicles.

### Ford Puma



The expressive front-end features intricately-designed, canoe-shaped 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.

### Hyundai 45

The 45 concept previews Hyundai's future design plans for electric and autonomous driving. Hyundai design chief SangYup Lee says the 45 refers to the 45-degree angles at the front and rear of the car: "These form a diamond-shaped silhouette that will be instrumental in the future design of Hyundai EVs".



### Land Rover Defender

Land Rover have rebooted the staunch Defender as a far more luxurious, roomier and high-tech vehicle. JLR's head of vehicle dynamics says the retooled Defender is "still fun" but without the flaws of the ancient model retired in 2016. The maker calls the front of the car "tough but approachable" using geometric forms and the latest headlight technology.



Land Rover design boss Gerry McGovern says "The clean body side contrasts dramatically against the sheer verticality of its front and particularly its rear to create a reassuringly purposeful stance".

### Mercedes Vision EQC concept

Here's a concept with no fewer than 940 individual LEDs!



Bookmarking the black panel grille are new "Digital Light" headlamps, each featuring two holographic lens modules allowing it to project signals onto the road as part of efforts to improve safety for pedestrians.

Share



A light band made up of 229 individual illuminated three-pointed stars dominates the rear end

### Opel Corsa



A real highlight is the adaptive glare-free IntelliLux LED® matrix light, which Opel are offering for the first time in the small car segment. In addition, there are numerous state-of-the-art assistance systems such as Forward Collision Alert with Automatic Emergency Braking and pedestrian detection as well as radar-based Adaptive Cruise Control.

### Porsche Taycan



Porsche have launched their first performance EV, the Taycan, which they think will help win new customers seeking the power of a supercar with a smaller environmental footprint. The headlamps bear a new, wider version of Porsche's signature four-dot appearance to the DRLs.

### SEAT Cupra



Diffused LED ambient lighting greets occupants as they open the doors. Outside, the front and rear lights bear SEAT's signature triangular light motif.

### VW ID.3



The Volkswagen ID3 is the first of what is expected to become scores of EVs that will share the German mass-market brand's global modular electric platform, known as MEB. With exterior dimensions and styling similar to the VW Golf, the ID3 bears its own unique, sleek light styling at front and rear.

### Wey



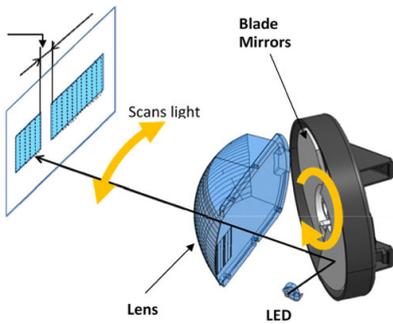
Wey is a new brand launched by Chinese automaker Great Wall to offer a line of luxurious and sporty SUVs. Here we see three DRL "teeth" above, with two DRL "walls" below.

### The Only Promotion of Lighting Innovations: Audi's Showcase



## LIGHTING NEWS

### Koito's "BladeScan" ADB



Koito have developed and started production of what they're calling BladeScan™ ADB, in which LEDs light two fast-revolving blade reflectors and takes advantage of human persistence of vision to light the way forward using the residual image effect.

Koito have already been promoting the wide use of ADB by commercialising their mainstay ADB, which they call Array™, that controls light distribution by switching each LED individually. BladeScan works differently.

By switching 12 LEDs in line with the rotation of blade reflectors, the new system gives high-resolution light distribution equivalent to the use of 300 LEDs, and tightly confines the shaded area. to maximise lit area. That lets the lights illuminate the vicinity of vehicles ahead and the areas between them, and promotes early detection crossing pedestrians, thus contributing to reduced traffic violence.



Toyota's new Lexus RX450hL and RX300 models are first to market with BladeScan ADB.

## Hella Aggressively Push Into HD Lighting

Hella are launching their next generation of lighting technology under the moniker "SSL | HD" (Solid State Lighting, High Definition). Behind the name: Hella have miniaturised the light source so 15,000 LED pixels can now be individually and intelligently controlled. A first series order for the integration of the technology into a headlamp has already been successfully acquired and should see the dark of night on the road in the next three years.



What it all means is that Hella have integrated very small, individually-switchable LED pixels on intelligent driver chips. By controlling the individual pixels, the light distribution on the road can be generated directly at the light source surface and projected onto the road via a multi-stage optical system. The higher number of pixels and the enlarged light-emitting surface allow new applications with higher light quality and performance.

The technology thus provides the basis for freely programmable lighting functions. Additional safety functions such as optical lane markers or further individualisation possibilities such as welcome and farewell animations or communication functionalities can be implemented by high-precision digital pixel switching. In addition, the SSL | HD technology enables the development of new business models: Hella offer automakers the opportunity to develop new business models on a pay-per-use basis. In this context, certain lighting functionalities are generally delivered in the vehicle, but are only activated and paid for on request in line with individual user requirements.

## Interesting Lights on Hyundai's 45 Concept

Hyundai's 45 concept previews the brand's future design plans for electric and autonomous driving.



**Headlamp**



**Rear lamp**

"Its name refers to the 45-degree angles at the front and rear of the car. These form a diamond-shaped silhouette that will be instrumental in the future design of Hyundai EVs", says SangYup Lee, Hyundai's design chief. The 45 has several details highlighting its EV technology, including a special indicator showing the vehicle's battery capability and active LED lights that tell drivers how much range they have, even before they get in the car.

## It's Official: The Name's Marelli

Calsonic Kansei and Magneti Marelli will officially change their respective legal company names to Marelli, with effect from October. The move to a single brand was first announced this past may, and is an important next step in positioning Marelli to compete even more effectively on a global scale.



Calsonic Kansei Corporation will change its legal company name to Marelli Corporation, and Magneti Marelli will change to Marelli Europe. Following this, the names of major affiliate companies will also be changed to Marelli.

Beda Bolzenius, Marelli's CEO, calls the name change "an exciting step forward on our journey as we come together as one global company. The formal changing of our company name is a tangible demonstration in our evolution towards becoming a leading global player, delivering high quality products and innovation for our customers around the world".

## Hella, PO Bring Holistic Front-End Concepts

Together with Plastic Omnium, Hella are further advancing the development of holistic concepts for the vehicle exterior. This initially includes comprehensive lighting solutions integrated comprehensively into the front area of the vehicle.

This new front-of-car approach is being presented at the IAA in the Hella stand in the New Mobility World.



Dr. Frank Huber, Hella management board member responsible for global lighting activities, says "The front of the car continues to gain in importance: on the one hand, it has a decisive influence on the vehicle design. On the other hand, it is an important integration location for numerous sensors, relevant lighting modules and further elements. Together with our partner Plastic Omnium, we are therefore working on an intelligent system approach for the vehicle front that opens up completely new design possibilities for the customer".

Plastic Omnium President and CEO Mark Sullivan adds "The coöperation with Hella enables us to offer customers sophisticated and unique system solutions for the vehicle front from a single source. At the same time, our intelligent system approach helps our customers to develop more functionalities while decreasing complexity".

The new concept has a multi-level set-up. At the beginning, development activities focus on efficiently integrating certain

lighting modules into the vehicle front, such as direction indicators or contour lighting. "The demand for such solutions is high. We could possibly go into series production within the next two to three years already," says Dr. Huber.

First development projects are also in progress for higher integration levels. This includes the integration of various electronic components, such as radar or lidar sensors or a front camera. Large displays for communication between the vehicle and its surroundings as well as headlamps could also be integrated at more sophisticated development stages.

## InnoLas, Osram Partner for Car Laser Development

Laser processing equipment provider InnoLas Solutions are in a development project with the Osram to create new laser diodes for vehicle lighting.

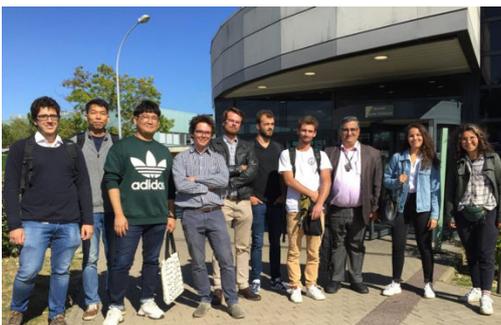


*InnoLas Solutions facilities*

LINEXO, the versatile laser processing workstation which InnoLas use to build special laser systems, helped to reach the required tolerances in this automotive project. Osram Berlin's industrialisation manager Marco Melinde says "We are more than happy with the supplied laser system from InnoLas". The task of the laser system in this project is to provide a micro structuring of a functional layer with single-digit tolerances on brittle ceramic chips.

"The high accuracy platform LINEXO in combination with a short pulse laser for cold ablation was the right choice for this special application", explains InnoLas CTO Niels Krauch. "We are looking forward to participate in future projects".

## ELS Field Trip to PSA



The Embedded Lighting Systems academic program's 2019-20 session is off to a fine start, as the third day of the program's welcome week involved a field trip to PSA in Velizy, organized by that company's lighting expert Dr. Whilk Gonçalves.

First, the students saw a presentation of the new lighting functionalities implemented on new PSA vehicles such as the DS7, Electric DS3, and new 208 and 2008.

The explanations came from Laurent Serezat, one of the founding members of the ELS Chair. In the afternoon, Nathalie Larribeau, a senior lighting engineer at ProLab Peugeot Style, explained the art of convergence between designers and the rest of the development teams in Peugeot's organisation. Finally, Whilk Gonçalves made a presentation of lighting innovation in the PSA Group.

## DRIVER ASSISTANCE NEWS

## Drivers Deactivate Annoying ADAS

ADAS alerts are irritating drivers, some of whom react by turning the systems off. That's according to the 2019 J.D. Power Tech Experience Index study. What's more, respondents told J.D. Power they're inclined to avoid the systems in future vehicle purchases.



One driver described his irritation with a new car's parking assistant: "In slow rush-hour city traffic, the damn thing won't stop 'helpfully' trying to direct my attention to what it thinks is a parking spot. Every time there's a gap between parked cars to my right, even if it's a driveway, the system pokes at me. 'Hey, look over there, there's a parking space'. It's distracting and aggravating and I hate it, and I have to disable it each and every time I get in the car. Never again; my next car will NOT have this."

Kristin Kolodge, J.D. Power's executive director of driver interaction and HMI, says "Automakers are spending lots of money on advanced technology development, but the constant alerts can confuse and frustrate drivers. The technology can come across as a nagging parent. No one wants to be constantly told they aren't driving correctly."

Lanekeeping assist, for example, tends to annoy an average of 23% of drivers with equipped vehicles. Brand by brand, the results vary with up to 30% of owners finding the alerts a nuisance. Of drivers who don't like the alerts, 61% disable the systems at least sometimes.

Collision-avoidance systems such as Automatic Emergency Braking garnered the most favourable reactions from owners. Smartphone mirroring came second, followed by comfort and convenience features such as voice recognition. Entertainment and connectivity such as linking phones and Bluetooth placed fourth, followed by driving assistance such as blind spot detection or lane keeping systems. Navigation finished last.

The survey included over 16,400 responses from people who bought or leased a 2019 vehicle of a model launched or redesigned within the past three years.

## AEye, Hella Partner to Demonstrate ADAS Solution

Solid state lidar-based perception systems developer AEye have provided their AE110 system as an integrated component in the Hella demonstration vehicle being presented at IAA.



The two companies announced last January that they had agreed a joint development and manufacturing plan to bring ADAS solutions to global automakers. The physical co-location of AEye's AE110 solid state lidar-based artificial perception system with Hella's camera software and radar is the first step to a much tighter integration resulting from this collaboration.

According to AEye, the AE110 system delivers 4 to 8 times the information of conventional first-generation lidar sensors, using a fraction of the time and energy. At IAA, Hella will be demonstrating the capabilities of the AE110, including instantaneous resolution in the form of defining multiple regions of interest within a scene; lidar-first perception; a fully software-definable sensor system with a comprehensive software development kit, and data management tools to import and integrate heterogeneous sensor data.

## Anslys, Edge Case Research Team Up for AV AI

Anslys are collaborating with Edge Case Research to engineer the next generation of autonomous vehicles with unmatched state-of-the-art hazard detection capabilities. Through a new agreement, Edge Case Research put their powerful AV artificial intelligence perception stress testing and risk analysis system, Hologram, within Anslys' comprehensive AV simulation solution to devise ways to maximise the safety of AVs.



Today's AVs rely on AI perception algorithms trained to make safety-critical driving decisions. Though highly advanced, an AV may fail to detect hazardous driving scenarios known as "edge cases", because its algorithmic training has not prepared it for the many unusual road situations it will encounter in the real world.

To ensure the highest safety of an AV, developers need tools to automatically identify these challenging edge cases in a way that is far more scalable than manual data labeling. Through this collaboration, Edge Case Research—who specialise in autonomy safety assessment software—will integrate Hologram with Anslys' highly sophisticated AV open simulation system. The resulting end-to-end capability analyses AV algorithms, detecting edge cases to advance development and help validate perception algorithms in the most advanced AV systems.

Edge Case Research CEO Mike Wagner says his company "chose to partner with Anslys because of their deep expertise in safety (...) Anslys and Edge Case Research will deliver an unprecedented comprehensive capability for safeguarding the next generation of autonomous driving systems."

And Anslys VP and General Manager Eric Bantegnie says his company "delivers a powerful data testing and analytics platform that unlocks the value of petabytes of AVs' recorded road data to find edge cases, significantly accelerating the development of safer, AI-driven perception software".

## GENERAL NEWS

### Great Wall Consider European Car Builds...Again

Chinese automaker Great Wall presented two Wey-branded SUVs at the Frankfurt auto show, including their "S" (not to be confused with Tesla's).



Great Wall Chairman Wey Jianjun says the maker might again consider building a plant somewhere in the European Union if their sales there hit 50,000 units a year, as part of a push to seek growth in overseas markets.

Great Wall are the № 1 SUV and pickup manufacturer in China, and are now exploring sales and production in overseas markets to expand their global influence and seek higher profit, as growth slows in the Chinese domestic market—the world's largest auto market. They plan to start selling Wey-branded SUVs in Europe in two years, and maybe more of their mass-market brand Haval as well; they already sell some pickup trucks in Italy, at least according to their website. In June Great Wall started production at a plant in the Tula region of central Russia with a manufacturing capacity of 80,000 cars a year. The company sold 624,000 units in the first eight months this year, 5.7% higher than the figure in the same period last year. "We hope to take market share from foreign brands, we are vigorously investing in R&D. The technology we're focused on developing now is technology that will be suitable for use in the 2030s," Wey told Reuters.

### SEAT Take to the Fast Lane on EV Releases



Following SEAT's announcement of the Mii and el-Born, the brand's first two fully electric models, the maker's Cupra brand is also presenting the new Tavascan concept car. It will be joined in by the new Seat Tarraco FR PHEV, the brand's first plug-in hybrid electric SUV. Altogether that's four of the six electric cars SEAT have said they will launch by 2021. Following the Formentor, the first Cupra model, the Tavascan concept car is Cupra's first fully electric vehicle, and it was developed on the MEB platform.