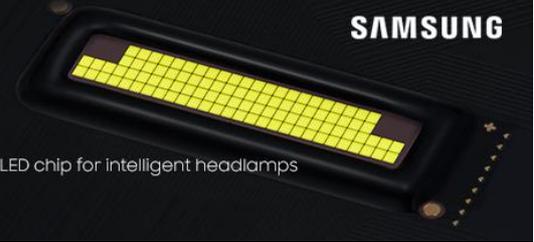


PixCell LED

Ultimate precision in perfect alignment

100+ individual cells with just 25 µm spacing, perfectly matrixed onto a single LED chip for intelligent headlamps

SAMSUNG



Editorial

DVN Events: Coming Soon Around The World

Three major DVN events are coming soon, on three continents: the US DVN Workshop (20-21 June in Rochester, Michigan); the DVN Think Tank Seminar (4-5 July in Stuttgart, Germany), and the China DVN Workshop (20-21 September in Shanghai).

What's more, at the end of next month this year's DVN Study **DVN Market Forecast on New Lighting Systems - Skills to Succeed** will be published, presenting for the first time a view to the future of the automotive lighting market in numbers and figures based on market data and numerous interviews.

I would like to take the opportunity to thank the whole DVN team for the enormous amount of work it takes to make these realities

- Jean-Claude Lebrun, the DVN President
- Wolfgang Huhn, who arrived one year ago as DVN Senior Advisor;
- Daniel Stern who has been with me since the beginning;
- Gerd Bahnmüller, our Technical Advisor who arrived three months ago;
- Philippe Aumont and Carsten Befelein in charge of DVN-Interior;
- Carine Abouaf, our sales and marketing manager;
- Geoffrey Lebrun in charge of the events;
- Christophe Lameiras in charge of sales administration;
- Alain Serval, our lidar advisor
- Our sales and technical representatives in America, China, Japan, Korea, and India.
- all of them working exclusively to DVN.

I don't forget our consultants Jean-Paul Ravier, Ralf Schäfer, Leo Metzmaekers, Sarah Ouaknine, Eve Taberna, for their strong involvement.

In total more than 20 people work with DVN—much higher than my expectation when I started DVN 15 years ago in this demanding field of lighting information.

Last and just about the opposite of least: my thanks also go to all the DVN Gold members for their ongoing trust and participation year after year.

Sincerely yours,


DVN CEO

In Depth Lighting Technology

Four Next Months, Four DVN Events



Today we bring you more information on the four forthcoming DVN events.

20-21 June: 24th DVN Workshop at Rochester, Michigan



The 24th DVN Workshop is coming up in one month's time near Detroit. As Covid-related travel restrictions have eased, European and North American participants will be much easier able to come to America this time round, so we are confident this event will be a grand success. The rubric—**Safety and Design: Challenges and Opportunities**—is timely and crucial, and the information and ideas shared at the event will make real contributions to decrease traffic fatalities in the world and propose new designs.

We look forward to welcoming your attendance and participation in an inspiring; exciting; lively, and safe conference in Michigan. Of course we will regularly keep you informed about any changes and updates, here in the weekly DVNnewsletter. Attendees will have the privilege of taking in lectures from automakers including Audi; GM; Lucid; Rivian; Stellantis, and Volvo; tier-1 suppliers such as Hasco; Hella; Koito; Magna; Marelli AL; Mind; Valeo; XingYu, and ZKW; researchers, regulators, and standards developers from at least three continents, and some of the greatest tier-2 suppliers in the lighting field.

The speakers will explain how digital and HD lighting allow communication with other drivers, pedestrians, and cyclists; the effect on safety for vulnerable road users, and how new technologies will facilitate new designs. There will be ample time for individual communication and networking during the coffee breaks; lunches, and especially the cocktail and dinner as a highlight on the first day.

The workshop will highlight how new technologies will contribute increasing safety in the world, while facilitating new designs. Topics will include ADB; LED; microLED; OLED; laser, and MLA technologies' effects on safety and design; and new functions including lit design elements like illuminated front grilles. The event will bring together more than 300 participants from all over the world—managers, experts, decisionmakers, researchers, and practitioners involved in lighting and ADAS. Discussion panels and exhibition booths will host fruitful exchanges amongst all attendees.

30 June: DVN Study Goes Live



On Thursday 30 June, our fifth DVN Study gets published. This year's rubric is **Market Forecast on New Lighting Systems and Skills to Succeed**. For the first time, a DVN Study gives a view to the future of the automotive lighting market in numbers and figures based on market data, and numerous interviews with automakers; tier-1 and -2 suppliers; research institutes, and of course the expertise of DVN's in-house experts and associates.

The Study provides a market prognosis about the new components and functions entering the market in the coming years, especially the new front end topography including illuminated grilles and logos; 360° projection; display communication, and new technologies like OTA updates. It describes the figures and numbers of the technologies based on the market trends like the success of EV, new design approaches, and technological improvements. Design trends and changes wrought by over the air updates and new hardware and software architectures are included and described.

The DVN Study is an independent market research work hewn from many sources, interviews and expert knowledge of DVN and DVN partners. It will deliver a well-founded prognosis of revenue and volume for the new lighting elements and functions, to help to make decisions on future investments and next products to focus. For the first time, a dedicated prognosis of the automotive lighting market is available. It is an additional source of information for decision making and business planning by tier-1 and -2 companies, while automakers will get a view of the market from an external and neutral perspective.

4-5 July: DVN Lighting Think Tank Seminar in Stuttgart



As a supplement to the big DVN Workshops, we launch smaller events: DVN Think Tank Seminars, where specific challenges and issues are interactively grappled with through a variety of lenses. The main point for this first lighting seminar will be the consequences of the new U.S. ADB regulation. Next, and partly connected, are the new front- and rear end architectures with huge lit elements addressed very differently in the world's various regulatory regions. This and many other points shall be discussed after inspiring keynotes on each of the three rubrics:

- **The Consequences of the New ADB Regulation in the US** (Michael Hamm)
 - The new NHTSA ADB standard was a big, negative surprise
 - How to interpret the new ADB standard and the required testing?
 - Could it be sufficient to test by simulation?
 - What other chances and risks does this NHTSA rule bring?
- **New Front** (Wolfgang Huhn)
 - Front lighting is moving beyond the headlamps and signal lights
 - Lit front blades, lit logos
 - International homologation; regulatory conflict and overlap
- **New Rear** (Hector Fratty)
 - Edge to edge tail light as a new standard?
 - Lit logos
 - 360° projectors: which technology?
 - International homologation and regulatory factors

Then, participants will break out into working groups for two-hour thought-and-discussion sessions on the three topical rubrics.

20-21 September: 25th DVN Workshop at Shanghai



The 25th DVN workshop will take place in Shanghai on 20-21 September at the Marriott Shanghai Parkview Hotel.

Conference and exhibition spaces will be safely laid out for hundreds of in-person attendees and a full onsite agenda. Registered attendees who will not be able to travel to Shanghai will benefit from VODs for all the lectures and slide shows from speakers during the complete event. The rubric: **Innovations for new Lighting Functions**.

Among the 25 lectures on the docket, contributions are expected from automakers Audi; GM; Great Wall; Nio; Shanghai-VW; Stellantis; Volvo, and FAW-VW; lighting suppliers Hasco; Hella; Marelli AL; Mind; Mobis; Valeo; Varroc; Xingyu, and ZKW; as well as light source suppliers AMS Osram; Everlight; Lumileds; Nichia, and TI. A diverse medley of lectures will highlight the recent trends in lighting and brand recognition. Discussion panels and exhibition booths will host fruitful exchanges among all attendees.

Lighting News

Forvia Had to Grow as Independent Company: CEO

LIGHTING NEWS



Patrick Koller (photo) has since 2016 been CEO of Faurecia, now Forvia. The past year has brought significant changes, as Forvia was spun off out of Stellantis after that automaker's creation from the merger of PSA and FCA, and Koller's company outbid other competitors to buy Hella.

Koller says "We needed to grow because we were not at critical size in the electronics and software fields. We needed to consider M&A for this reason. Hella is perfect because it has two main specialties, one of which, lighting, is a nice add that is aligned with what we are doing in terms of systems, design and safety. Then you have Hella's electronics and software, which will give us size to achieve leading positions, especially in automated driving and in electrification.

"In purchasing, we can put our volumes together to improve performance. This is happening on electronic components, raw materials, plastics and more. But we are also considering the real estate that we are renting or using worldwide. We don't need two offices in Wolfsburg and two offices in Munich, for example. There are several possibilities to reduce the costs in these areas. As another example, we are not vertically integrated in plastic injection toolings, but Hella is, and I think we can measure the benefits of being partially vertically integrated in this area, especially when most tools are coming from China. These are conventional synergies, and maybe the visible part of the iceberg, but when you move from €24 billion in sales now to more than €30 billion in 2025, you have many opportunities directly related to growth, such as your footprint and fixed costs.

"We clearly have to work more on the recycling part, on the circular economy, on repairs, and so on. A vehicle loses 25 per cent of its value in the first year. Maybe we will have the possibility to upgrade vehicles to maintain their value, not only the electronic part over the air, but also the hardware, because their life cycles might increase. The maintenance of an EV is significantly lighter and easier than a thermal powertrain. If your car can be maintained at a very high level there is no need to replace it, so long as it's fulfilling your needs."

Two Interesting Lighting Lectures from SAE Congress

LIGHTING NEWS



Illuminated Vehicle Logos: Investigation on Potential Distraction *Michael Hamm, Audi*

This study investigated the potential influence of illuminated logos on road safety. European lawmakers forbid the use of illuminated advertisements on vehicles to minimise the danger of distraction for other road users. As of now, active illumination of the manufacturer's logo is considered an advertisement.



A test vehicle was set up with two high-luminance monitors—one each at the front and back, capable of producing 4000 cd/m^2 . With this, it was possible to efficiently vary size; form, and illuminance between the logos to find a suitable range for illuminated logos. This vehicle was

driven past each test subject, and their attention and distraction were measured. Additionally, a questionnaire was answered after the study to find the test subject's objective opinions and evaluations of the illuminated logos.

The results for gaze tracking showed no significant differences in fixation between an illuminated logo and currently-allowed light signatures. Showing an actual advertisement with different colours, however, led to a significant increase in the number of fixations on the passing vehicle as well as an increase on the gaze duration on the passing vehicle. Even clearer than these objective results is the subjective evaluation. Here the light signatures with the illuminated logos were rated as non-distracting and were not perceived as advertisements.

Photometric Characterisation and Vehicle Operator Observations of Road Projections and ADB

John Bullough, Icahn School of Medicine at Mount Sinai

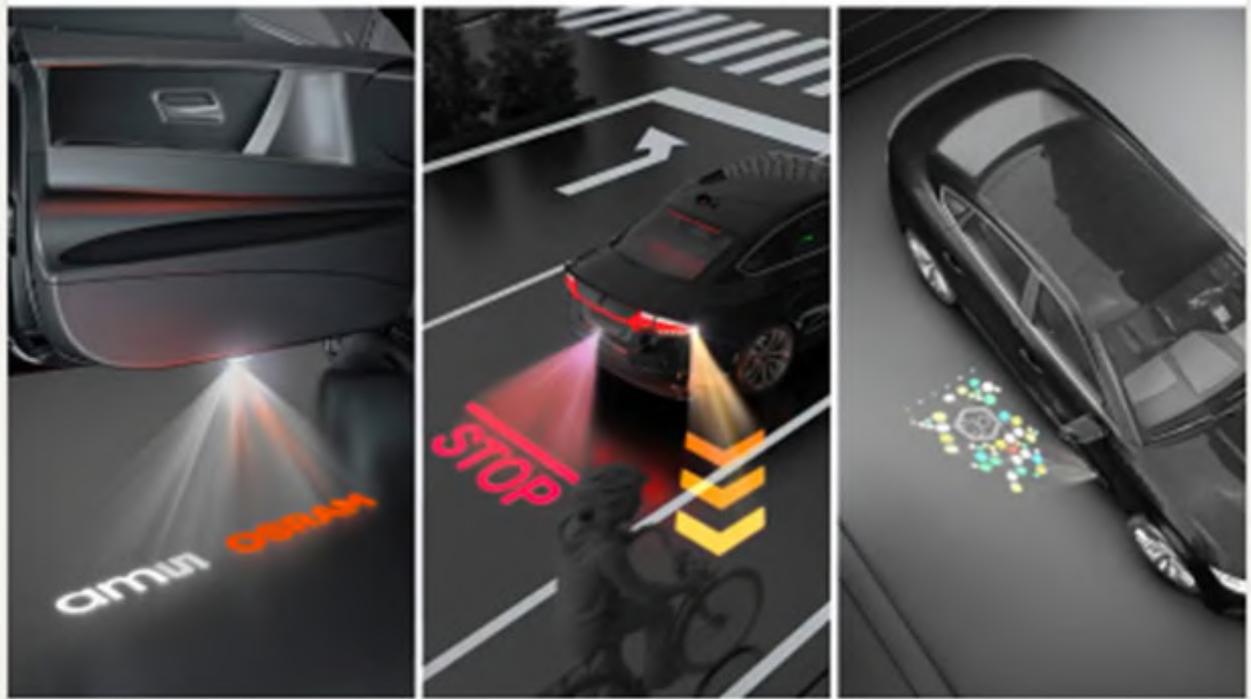


This study described real-world photometric measurement data for roadway projections providing guidance as to lane position and intentions to change lanes during highway driving, and of ADB headlighting performance during meeting scenarios on unlighted roads.

The new lighting systems not only provide a mechanism for reducing glare for opposing drivers while maintaining driver visual performance but are of sufficient intensity and resolution to be able to provide useful visual guidance information projected onto the roadway surface. They can also provide a personalised experience as individual drivers enter and exit their vehicles. Subjective impressions of lighting functions and evaluations of visual headway benefits of road projections were described, confirming the potential benefit to driving safety and driver confidence during nighttime applications.

Projection Solutions at AMLS

LIGHTING NEWS



AMLS technologies encompass various types of projections that cover a broad set of functionalities. Static projections are the most affordable; easiest to implement, and can display static but structured patterns in white or colours. Semi-dynamic projections based on multiple LEDs can display dynamic patterns and signals in white or colours, ideal for visually extending existing functions such as the turn signal. And digital projections based on DMD technology can display fully dynamic video in white or colours that can be assigned in advance or on the fly, allowing maximum flexibility and user experience. Bas du formulaire

Driver Assistance News

AutoX AV will Have SiLC Lidar

DRIVER ASSISTANCE NEWS



The AutoX fleet of over a thousand robotaxis (and counting) will soon get the Eyeonic Vision Sensor, an FMCW lidar from SiLC Technologies. SiLC say their lidar sensors provide accurate depth, instantaneous velocity, and dual-polarisation intensity. The lidar operates at the 1,550-nm wavelength, which helps it provide long-range effectiveness with good eye safety. The FMCW lidar transceiver chip integrates lasers, wave guides, and a semi-amplifier, where others need four chips.

AutoX founder and CEO Jianxiong Xiao says his company "are laser focused on, and fully committed to, our mission of democratising autonomy—to accelerate the advent of fully driverless cars. We're excited to work with the world's leading 4D lidar chip supplier".

And SiLC founder and CEO Dr. Mehdi Asghari said "In addition to being the only fully chip-integrated solution on the market, SiLC also has demonstrated the longest-range FMCW lidar operation. This and the combination of precision velocity enables a vastly simplified and lower latency perception stack".

Apple Car Director Moves to Luminar

DRIVER ASSISTANCE NEWS



Christopher Moore, most recently a manager on Apple's car project and before that an "Autopilot" director at Tesla, is going to lead global software development at Luminar Technologies.

Moore will lead Luminar's software team to develop autonomous safety features integrated with lidar. His departure from Apple is another of many ripples in the Apple Car pond; over the last two years' time, almost the whole of the Apple Car management team has gone, while Apple have hired new managers from Ford, Rivian, and other automotive companies.

Luminar, who went public via a USD \$3.4bn reverse merger in 2020, have signed agreements with Mercedes-Benz; Volvo Car, and SAIC to provide laser sensors to enable semi-autonomous driving in passenger cars. Luminar also have hired Taner Ozcelik, a veteran of Nvidia's automotive business, to lead product development.

General News

Mercedes Concept Previews AMG EVs

GENERAL NEWS



DESIGN ESSENTIALS IV – THE ART OF CREATING DESIRE, 2022, NIZZA: VISION AMG DESIGN ESSENTIALS IV – THE ART OF CREATING DESIRE, 2022, NICE: VISION AMG

The Vision AMG show car previews future full-electric models from the Mercedes performance brand. INT

Steeply raked windshield pillars; flared wheel arches, and an extended, aerodynamic rear overhang emphasise the Vision AMG's sporty character, say Mercedes.



The four-door show car is based on the automaker's AMG.EA platform, which will be used for full-electric performance models, and previews EV models to be offered from 2025 under Mercedes' high-performance AMG brand.

At the car's unveiling on Thursday in Nice, France, Mercedes-Benz Group CEO Ola Kallenius says "With this study, we are now offering a first glimpse of how we are transferring the AMG DNA in the all-electric future, starting in 2025".

Under Kallenius, the AMG brand will play an increasing role in Mercedes' profitability, along with other ultrapremium vehicles from Maybach; G-Wagen, and the forthcoming Mythos limited edition series.

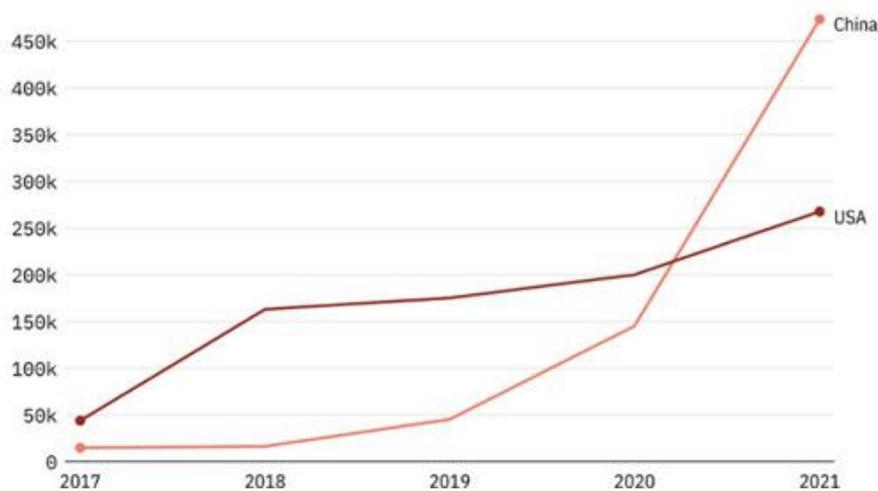
Mercedes already sell a number of AMG-branded EVs.

China Overtakes USA as Largest Tesla Market

GENERAL NEWS



Tesla want to make more cars in China, the world's top electric car market. Specifically, they want to make a million cars a year in China by the end of this decade, and cement their presence in China as a premium brand and leader in the high-growth EV segment.



TESLA UNIT SALES IN THE BRAND'S TWO LARGEST MARKETS, USA & CHINA (GLOBALDATA PLOT)

Tesla have confirmed plans for a second Chinese manufacturing plant at Shanghai. According to reports, the second plant will have annual vehicle production capacity in the region of 450,000 units and will start by making the Model 3 and Model Y. This second plant will double Tesla's China capacity, to nearly a million units a year.

By 2029, Tesla's total production is forecast to reach more than 2.5 million units, of which 900,000 in the U.S.; 700,000 in Germany, and 950,000 in China. If that figure is achieved, it would put Tesla's volume close to that of BMW and Mercedes; each of those companies makes around 2.5 million units per year.