

Tue, 19 September
2023
Weekly Newsletter



NEWSLETTER #821

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



Editorial

DVN Study On The Horizon

On 1 November this year, we will release our 6th [DVN Study: ADB and Extension to Light Projection](#).

In it, you will discover all the pertinent information concerning the status and the development of technologies, functions, market perspective, regulation, gleaned and curated from more than 20 interviews of car makers, suppliers, regulators and test houses, and scientific institutes.

It will describe in detail the different competing technologies including the products going into production, from the main lighting suppliers and an evaluation of the various performances, weight, power consumption. Legal and regulatory aspects in the different markets are assessed and described with clear-sighted forecasts.

This, like all five previous DVN Studies, is a work of information only DVN can provide, from our expert knowledge and the expertise of our worldwide network of subject matter specialists: Wolfgang Huhn, Paul-Henri Matha, Michael Hamm, Gerd Bahnmueller, Thomas Froehlich, Jean-Paul Ravier, and myself, Hector Fratty.

You will also see the facts and figures to describe the fast-paced changes of automotive lighting”.

This makes the 2023 DVN Study unique for the vehicle lighting business.

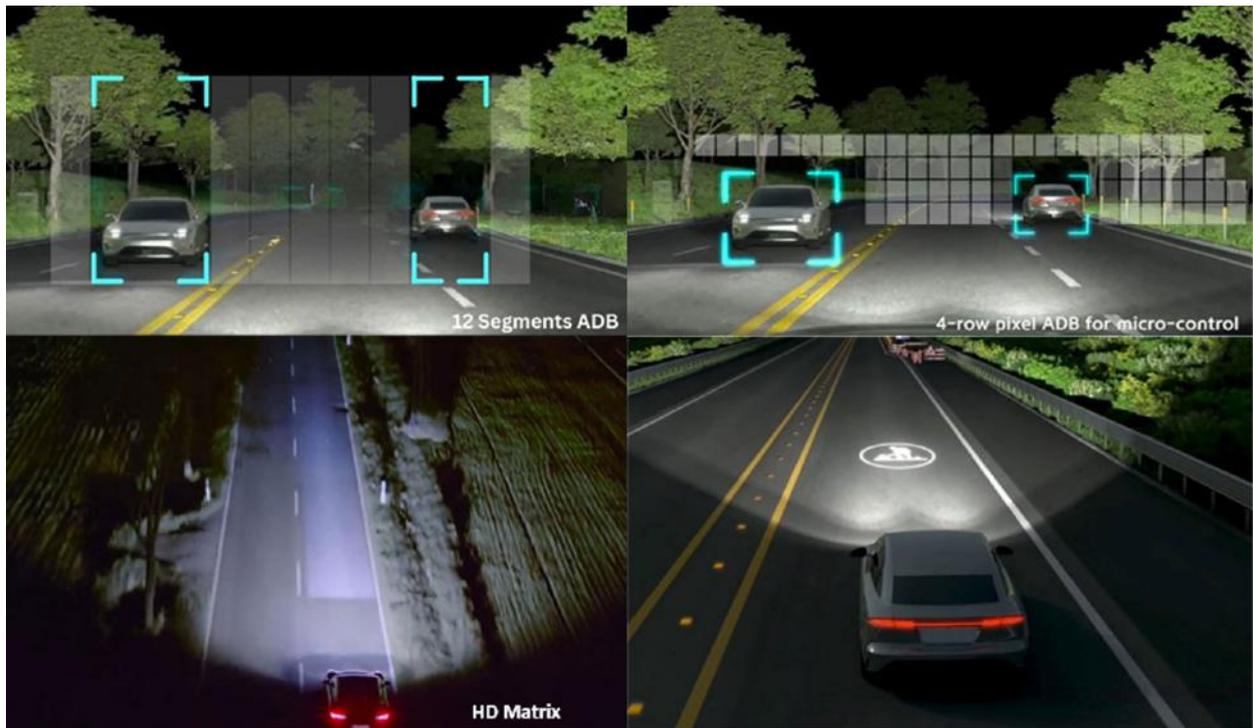
Important information: DVN members can now get [the video](#) concerning the US DVN workshop in San Francisco.

Sincerely yours

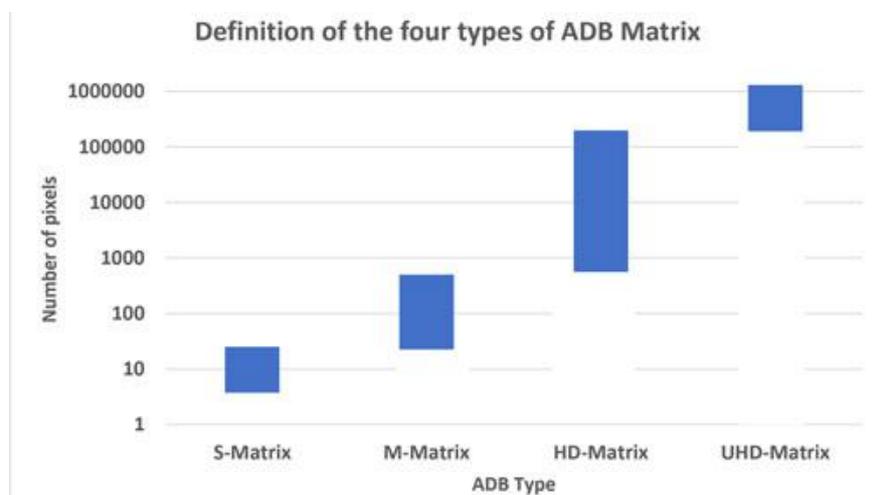
A handwritten signature in black ink that reads 'H. Fratty'. Below the signature, the text 'DVN CEO' is printed in a small, sans-serif font.

In Depth Lighting Technology

6th DVN Study: ADB and Extension to Light Projection



On 1 November, DVN will release our 6th Study: **ADB and Extension to Light Projection**. For the first time, a DVN study will give a view to the future of vehicle lighting concerning ADB and its extension to light projection, with numbers and figures based on market data from interviews with automakers, tier-1 and -2 suppliers, scientific institutes, and of course the expertise of DVN's in-house experts.



One of 30 figures in the study

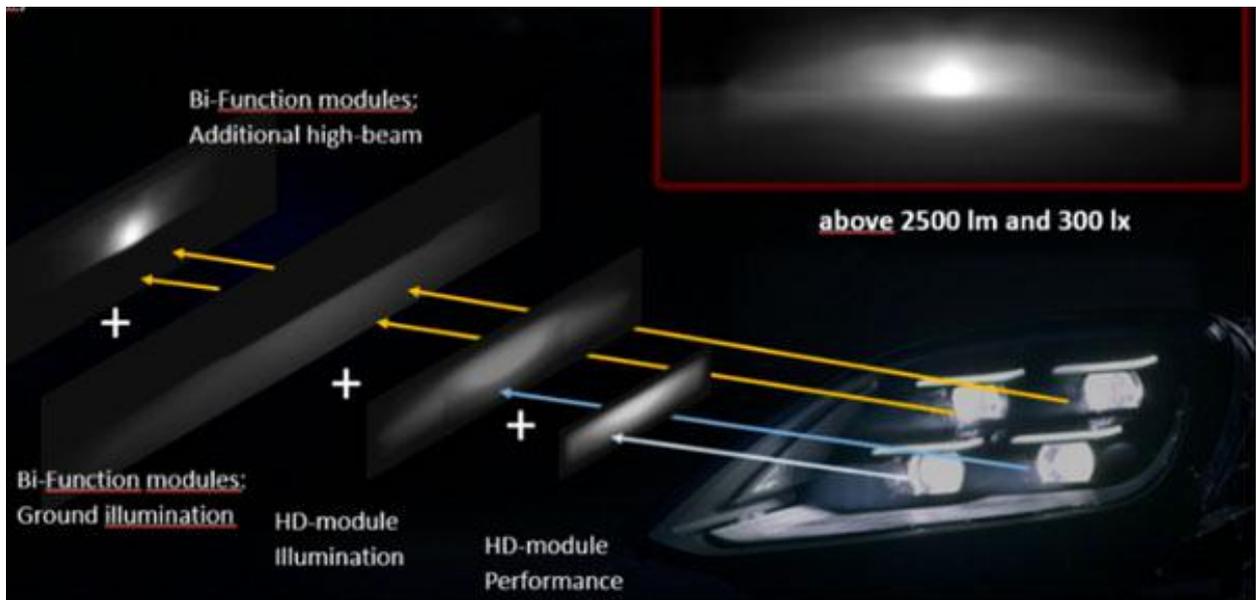
The study will describe in detail the different competing technologies: from mechanical solutions to few segments, rows of many LEDs; microLEDs, and pixel systems. It will

evaluate the various performance factors, weight, and power consumption. The study will show legal aspects in the different markets and covers the ability of road projection of these different systems, with their integration in the future electronics architecture and ADAS.



The 6 authors: Th. Froehlich; P.H. Matha; J.P. Ravier; H.Fratty, M.Hamm; G. Bahnmueller

The DVN Study is a thoroughgoing independent market research project synthesizing information from many sources, interviews, and expert knowledge of DVN and DVN partners. It will bring you well-founded forecasts of revenue and volume for the different ADB systems, to help to make strategic decisions on investments and product development focal points—a great asset for shrewd business planning by suppliers and automakers, who will get a view of the market and the future perspectives from an external and neutral position.



HD-Matrix Porsche – DVN Paris workshop

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Headlight Glare Blues: Not Our Problem? Yes It Is!

LIGHTING NEWS



Analysis by Daniel Stern, DVN Chief Editor

One comment that roused my ears amidst the great lot of technical information at the US DVN Workshop in San Francisco shortly ago was from DVN's Paul-Henri Matha. The question came up of reducing headlight glare by going toward a warmer white light, backing away from the bluer-and-bluer-and-bluer trend, and Matha said this idea is not discussed in Europe; there's no public objection to the bluer colour of today's headlamps because in Europe the headlamps are well aimed.

It's legitimately arguable that European low beams, aimed so low as to eliminate every last little bit of glare, are too low to give adequate seeing distance. That argument is growing weaker as nighttime pedestrian deaths rise in the U.S. and fall in many countries outside the American regulatory island, where "European" (rest-of-world) headlamps and aim specs are used. It grows even weaker as ADB gains traction even in popular-price vehicles, again outside the American island.

Leave that batch of arguments on the shelf for a moment, though, and think about the original question, Maybe whoever asked it at the DVN Workshop doesn't personally feel blinded by 'those awful, glaring, bright blue headlights', but at least they were aware

that's a notion that has currency in America. Why something can't be 'done about them' is a question asked, in so many words, again and again in American traditional and social media. It's not a new complaint; it flared up in the mid-1990s when Xenon headlamps first came to American roads, and in the mid-1980s when halogens began appearing on U.S. vehicles. Every time, the reaction from regulators and engineers alike has been a dismissive scoff and shrug—'it only seems glaring to you because it looks different to what you've seen before'—and unhelpful, patronising advice: 'just look away from the glare'.

Meanwhile, headlamps are growing smaller, brighter, and bluer than ever; those are three factors that aggravate headlight glare. And despite the valiant efforts of IHS, whose headlight tests are nudging new-vehicle headlight aim closer to where it should be, once a vehicle is on the road in North America, the aim of its lamps is vanishingly unlikely ever to be checked or correctly adjusted—this despite the U.S. Congress' apparently toothless [order](#) that NHTSA "amend [FMVSS 108] to ensure that headlights are correctly aimed on the road" (which will almost surely be ignored by NHTSA as they did with the order they were given in that same law, requiring acceptance of the SAE J3069 ADB standard).

As I've written ([once](#) and [twice](#)) before, that's a huge problem. Headlight aim is overwhelmingly the primary determinant not only of how well a driver can see at night, but also how much glare they're throwing around. That's not a guess; it's settled science thanks to careful, rigorous work by UMTRI and the RPI Lighting Research Center.

Non-experts don't perceive misaimed headlamps as such; they just see them as too bright, as blinding. That's understandable and legitimate; today's high-intensity low beams, aimed just a little too high, are effectively high beams. But then these non-experts describe them by their apparent characteristic: that blue-white colour. Add some misinformed demagogues with a bunch of social-media followers, and 'DO SOMETHING ABOUT THOSE BLINDING BLUE LED HEADLIGHTS!' gains apparent legitimacy as an idea and spreads fast like wildfire, [destroying](#) as it goes.

White light with more blue content provokes significantly worse (nearly 50 per cent worse) subjective/discomfort glare ratings than light of equal intensity but less blue content—here again we tip our hat to UMTRI for thorough research demonstrating this. And technologically-imposed constraints on headlight colour have [never been looser](#), so yes, theoretically we could reduce the glare by reducing the blue. Now let us think again about what Paul-Henri Matha said at the DVN Workshop: mostly people in Europe don't complain about 'those blue headlights' because 'those blue headlights' mostly don't give people cause to complain about them, mooted the question of whether it's the blue or the intensity to blame for the blinding. That lack of complaint might not be quite so complete; Britain also has [its own little group](#) of ignorant-but-very-sure-of-themselves cranks linked to the American crackpots.

But not all of those UK complaints are overheated conspiracy-theory nonsense. The UK's RAC (comparable to ADAC in Germany or AAA/CAA in North America), in a 2019 [research survey](#), found a lot of UK drivers feel dazzled or endangered by headlight glare. Probably some proportion of these complaints are understandable by reference to yet more good UMTRI science: perception of glare varies according to the perceiver's experiential frame, so someone accustomed to a low-glare traffic environment will have a lower intensity threshold of "HEY, OW!" than someone accustomed to a high-glare traffic environment. An interesting thing about the UK survey: respondents made no overwhelming association between "blue" and "dazzle".

Assuming glare complaints outside North America are substantial enough to warrant attention to the causative factors, those countries have a giant advantage; a huge head start: they've already got numerous glare countermeasures in place: photometric and aim specifications with emphasis on glare control; headlamp levelling systems, and—most importantly of all—vehicles get their headlamp aim checked and adjusted regularly.

So if it's found, for example, that those checks are being done sloppily, it's a relatively simple matter to tighten that up. The RAC survey mentions this was done in Britain in 2016.

None of that 'infrastructure' for addressing headlight glare exists in North America, and the longer the problem is ignored as technological evolution makes headlamps inherently more glaring, the worse the problem gets. We in the vehicle lighting community mustn't just shrug and look for the regulators to fix it; they won't or they can't, at least not on their own. We've got to actively step in and clean up the glare problem—the aim problem—in North America. Maybe that means forming a technical advocacy group to coördinate with the American Association of Motor Vehicle Administrators in developing and advancing the state-by-state adoption of up-to-date, appropriate headlight aim regulations (something NHTSA can't or won't do). Maybe there are other ways of getting the boat turned around and headed in the right direction. It's unfortunate and perhaps unfair that it falls to us to clean up the mess, but it does, and so we must!

DVN Interview: François Bedu, Renault Lighting Expert

LIGHTING NEWS



Paul-Henri Matha, DVN COO

When I left Renault five years ago, I had not worked at all on the new Renault models I just saw for the first time at IAA. It was a 100-per-cent surprise for me, and a really nice job on the lamps! On the Scenic, we can find (another) instance of small low beam and high beam reflectors, like in the Renault Megane.

The new Scenic E-Tech EV shown above has new signature headlamps introducing the latest revision in Renault's brand identity. Light patterns merge into the headlamps at the top of the grille, creating a spectacular high-tech effect. A welcome sequence greets on approach. LED Adaptive Vision technology is available on some versions; it adapts the beam pattern to suit the driving conditions. The turn indicators are sequential. At the rear, the high-tech lights are arranged as two road corners merging off into the forward distance. Microöptic technology brings them to life when activated, and they appear to float when switched off.

I made an Interview with Renault lighting expert Francois Bedu during IAA in Munich this month.



François Bedu at a DVN Workshop

Paul-Henri Matha: Can you talk a bit about these lamps?

Francois Bedu: These headlamps are carryover of Megane E-Tech electric. We have just changed some decorative parts inside and styling integration on the vehicle gives the impression of something fully new especially with the embellisher placed below the headlamp.

DVN: Bumper lamp seems to be the new signature for Renault vehicles, after the new Clio facelift. We can see a 2K lens and very well integrated seamless DRL. Could you explain us a bit more the concept?



F.B.: The new signature seen on latest revealed vehicles (Clio, Rafale and Scenic E-Tech electric) is inspired by Vasarely logo designed in the '70s as the new Renault logo. It was very sharp and geometric, composed of thick and thin lines. This old logo is part of the actual inspiration. To realise such design, a 2K outer lens is mandatory. Concerning optical design, different possibilities can be used: reflectors with inner lens to avoid hot spot or multiple light guides with inner lens to hide the optics.

DVN: About the Rafale (blue car shown below): headlamp technology is different. We recognise the Valeo ultra-thin lens module presented at ISAL 2022 if I am correct. I suppose also you have matrix technology on the car. Am I right?

F.B.: Yes, this is the 15mm height ultra-thin lens modules from Valeo which have been chosen for this application. Obviously, this vehicle will be equipped with LED Matrix Vision.





DVN: For rear lamps we see again the μoptics on flat blade already seen on the Austral and Megane E-Tech. Can you talk more about the concept evolution?

F.B.: On the Austral and Megane E-Tech electric, these μoptics were used on 2 blades to create a moirage effect. For the Rafale, there is only one blade. Microöptics are installed in combination of 'ice cubes'. Here again, we are playing with thick and thin lit elements, same as the front.

DVN: On both the Scenic E-Tech and Rafale, It seems that we recognise some standard modules in the bumper and for the CHMSL, but not in the exact same shape. Is it a standard module? And could you explain your strategy about standardisation? Renault has always been a key player when we talk about this strategy.

F.B.: For CHMSL, there is a strict strategy of standardisation which gives to Renault the possibility to integrate the part on different vehicles. Thus, the Scenic E-Tech electric, Megane E-Tech electric, Austral, Espace, and Clio have the same part. The Rafale is different as it is an interior CHMSL. For reverse and fog, standardisation has been also decided but only at LED module level. Two possible sourcings of modules are used and housing and lens are redesigned for integration if necessary.

DVN: On both cars we do not see any front fog lamps. Do you cancel them, or have you developed another solution for bad weather conditions?

F.B.: With the large front combination lamp installed in bumper, there is no more space to implement front fog lamps. To compensate this, a specific All-Weather mode has been developed in the AFS. This mode can be manually activated with the lighting switch. This function is available in LED Adaptive Vision (or in LED Matrix Vision) of the Megane E-Tech electric, Austral, Espace, Scenic E-Tech electric.

Geely Galaxy L6 Launched

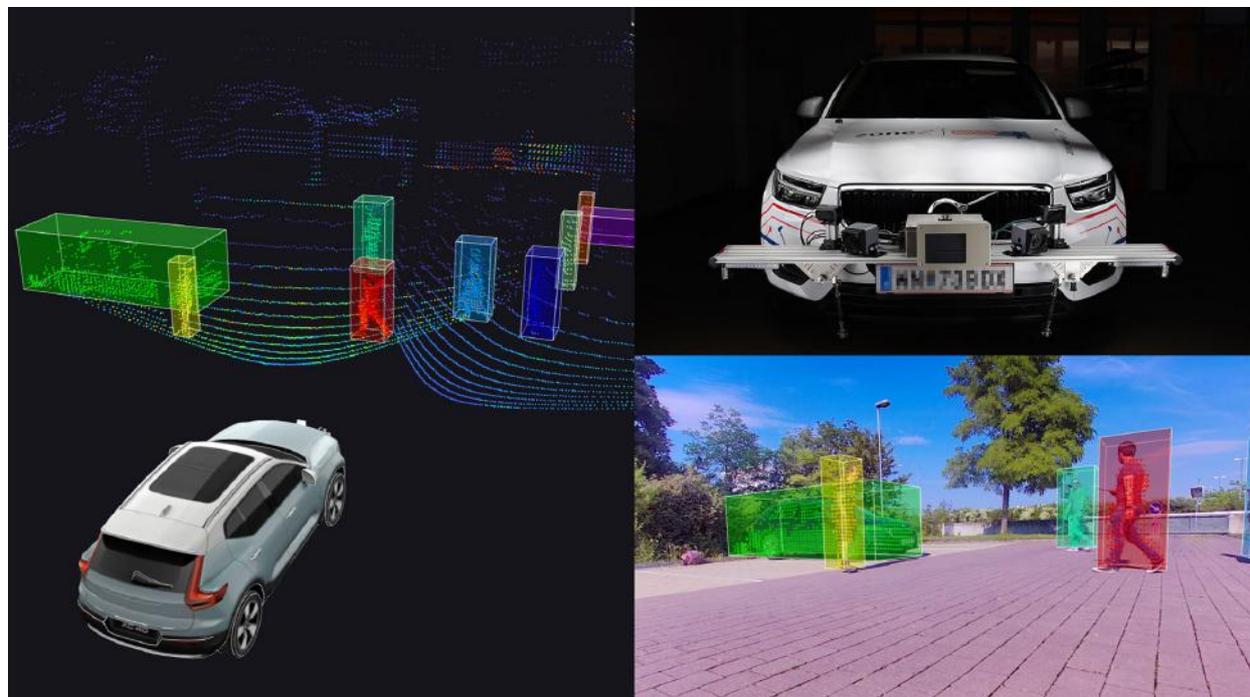
LIGHTING NEWS



The Geely Galaxy L6 was launched on 16 September. It has full-width white front and red rear light bands. The headlamps and DRLs form a T-shape reminiscent of recent Cadillacs. The taillights have a strobe-stripe design which reminds of the Kia EV6 arrangement.

ZKW Partners for Innovative Control Device Concept

LIGHTING NEWS



Experts from ZKW; the Austrian Institute of Technology, and the mechatronics course at FH Wiener Neustadt are working on the 'zone Z' research project for development of robust vehicle environment detection and an innovative control device concept to facilitate increasingly intelligent safety functions for cars.

The common goal of the project partners is to address various vehicle sensors for detecting the environment—radars, cameras, and lidars—directly, via a powerful control unit, and this same unit would also control the likes of headlamps and displays.

To process sensor data in the vehicle, the ZKW team are primarily concerned with the question of future renewable energy architectures in the automotive industry and the associated control device types. A clear trend is towards zone architecture and the zonal control devices required for this. Various functions that were previously performed by individual control devices are bundled in defined zones.

The environmental data recorded by the various sensors is processed to reliably identify vulnerable road users, such as children, pedestrians, and cyclists. Training the AI algorithms requires the analysis of thousands of different traffic situations. Therefore, a wide variety of scenarios are initially recreated using computer simulations and the sensor data required for the AI system is derived from this. The final fine-tuning of the evaluation process is carried out with the help of real measurement data that is recorded while driving the test vehicle.

General News

Mobis Expand U.S. Startup Search

GENERAL NEWS



The second Mobis Mobility Day in California was recently held under the guidance of Mobis Ventures Silicon Valley (MVSV).

The company shared their future mobility vision and investment plans with 200 attendees, including startup representatives, investors, and industry experts, participated, garnering substantial acclaim.

Hyundai Mobis are expanding their investments in global startups with core future mobility technologies. The strategy is to bolster competitive allies in specific areas, such as semiconductors, software, autonomous driving sensors, and infotainment, and support their growth. In the past five years, Mobis have come close to investing €1bn directly in these companies.

Mitchell Yun, the head of MVSV who hosted the event, said, "More startups than last year are looking for collaboration through Hyundai Mobis's investment...we will focus on discerning the valuable ones by understanding Silicon Valley's market trends and technological movements".

Since establishing MVSV in 2018, Hyundai Mobis have continuously expanded their discovery and investment in local startups. Collaborations with these startups have led to tangible results, such as achieving significant orders based on new technologies.

