DrivingVisionNews.com
Automotive lighting and driver assistance technologies

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Editorial

We Must Be Optimistic

COVID-19 is continuing to kill more and more people in the world, pushing to work at home for most of us, and worrying about a very bad economic situation coming. But there's still reason for optimism. With several experts, we're working on a study about the future of new lighting functions, including for safety, communication, and styling. We're putting together interviews with automakers, lighting suppliers, and research institutes. The first interviews I personnaly conducted show that even if difficult months are in front of us, there are reasons to be optimistic on the future of automotive industry, in spite of huge economic problems.

• There was worldwide financial confidence before the crisis, not like 1929 and 2008, and this confidence will come back. Look at China, which is already in a trend of growth.

• More than in the past, people will wish more and more to use their own car to avoid contamination.

• One of the main thing most of us miss is driving. We will be happy to continue to drive, to use the car going where we want. From my side, my first action will be to drive, to drive at night, enjoying the freedom.

• Perhaps CO_2 constraints will decrease, helping automakers spend less money.

I also think, that after few months, the lighting business will start again, using more safety technologies like ADB and new functions. Be patient and I hope at the end of the year, we will find the nice feeling automotive developments bring to all of us.

This week you'll find our DVN Report on the North American vehicle lighting environment and ecosystem. And this week there is a new and last chapter in our

onrunning saga "The Wonderful Story of Lighting", wherein Jean-Paul Ravier presents new technologies. Don't miss it.

Sincerely yours

DVN President

In Depth Lighting Technology

New Report on US Industry: “Constraints of NA's Lighting environment Give Rise to Innovation Opportunities”

DVN releases today its third report on vehicle lighting in North America.
This report focusses in two parts on the topography of the North American vehicle lighting world.

Daniel Stern, the author of the report

- The first part describes the environment; that involves a critical look at the legal and regulatory circumstances that keep the latest technology out of reach of American motorists.
- The second part describes the ecosystem by profiling a diverse selection of lighting-involved companies and entities doing interesting, notable things in North America.
This unusual report is just right for these unusual times, as we work from home, thinking of creative ways to make the best of what we have and adapting to a less-than-optimal situation, this report describes how structural constraints baked into North America's vehicle lighting environment give rise to unique strengths and innovation opportunities.

There's also industry news. A very old name, once utterly central to the American lighting industry, has exited the business in an unusual manner and been supplanted by a different very old name; we present the details in a behind-the-scenes look. There are mergers and acquisitions to talk about.

Laser-lit high/low beam

Some of the high-tech innovators we've covered in past reports are still growing and going from strength to strength. There's exciting work being done in laser technology —by more than one U.S. company. The formidably capable American human factors research community carries on turning out highly relevant science. And no matter what regulatory disappointment gets handed down, the SAE Lighting Systems Group continues devising and revising technical standards for all kinds of vehicle lighting.

It's an apt time to consider the enormous amount of vehicle lighting and driver vision expertise, talent, and skill in North America.
An assortment of factors make the North American vehicle lighting market the world's most unusual among developed countries. The international-consensus U.N. Regulations are not recognised, which has numerous knock-on, ripple, and feedback effects: it means a a different mix of differently-configured vehicles, a different regulatory philosophy, different ways of thinking about the subject of vehicle lighting. To be sure, this particular variety of American exceptionalism—to which Canada is more or less handcuffed, by dint of geographic proximity and relative market size—creates friction, difficulties, and costs.

But the report also gives rise to opportunities, strengths, and talents that would likely have a harder time thriving if the American markets weren't dancing to its own rhythm. Standardisation and modularisation, for example, which are hot topics in today's global vehicle lighting world, have a long history in America. The regulatory system invites not just frustration (though there is plenty of that) but also creative thought. The mix of benefits and drawbacks, constraints and opportunities created by the topography of the American vehicle lighting market is intricate and complex.

J.W. Speaker with adaptive lighting functions

American human-factors study of driver vision and vehicle lighting is prodigious and consistently excellent; two of the world's foremost research institutes in the field are in the United States. American efforts in headlight performance rating are paying off in ways that raise interesting questions about the effectiveness of regulation versus market-based incentives for lighting improvement.


Silicon optics

A North American company is a world-renowned tooler, maker, and supplier of retro-reflectors and other precision optics for vehicles all over the world. A company set amidst fields in the American Midwest makes magic with LEDs for cars, trucks, motorcycles, off-road vehicles, and spacecraft. A company headquartered in California recently added three big new factories in the United States to their existing two in Asia.

New concepts include fog lamps that communicate to pedestrians with icons and symbols, cameras and sensing technologies, and integrated DLP light projection; new animated lighting approaches for automaker badging, and perfected super high

resolution puddle lamp projection that portend many other applications in, on, and around the vehicle.

Fog lamp that communicate to VRU

And an American small business run with great dedication and passion for their speciality has come up with an elegant solution to the intractable American ADB logjam.

There's an enormous market for car bulbs in North America; Philips, Sylvania, and Tungsram are hard at work launching numerous new products on aftermarket. More than that, they're offering product varieties LED retrofit bulbs for interior applications in a choice of 4,000K or 6,000K, for example.

LED retrofit bulbs for «fog lamp»

They're offering LED retrofit bulbs designed to replace halogen bulbs like H7, H11, and HB4—like Philips and Sylvania, they're packaging and promoting them as intended for fog lamps (with a wink and a nudge); headlight bulbs are federally regulated in the United States, but fog lamps are not. "Our engineers are really proud of those LED bulbs", says Bar

Lighting News

SAE DRL Spec Gets an Update

The SAE Lighting Systems Group have been working to adjust the latest version of J2087, which contains specifications for daytime running lights. Language has been clarified, photometric tables have been simplified, and—significantly—the allowance for producing the daytime running light function with reduced-intensity high beam headlamps has been removed. It will take another affirmation ballot before a new version of J2087 is cleared for publication.

The high-beam DRL was an early placement in the SAE standard, primarily to facilitate easy and inexpensive addition of a DRL function to vehicles without adding a new lighting device. The troubles with obtaining a DRL function by reduced feed to a halogen bulb are bulb blackening due to sub-rated voltage not permitting the halogen cycle to operate, and the cone of illumination narrows as voltage is decreased. So if the voltage is decreased enough to reduce the central intensity below the maximum-permissible 7,000 candela, the DRL is useless at wide view angles. But if there's enough intensity at wide view angles, the DRL is too glaring straight-ahead. And with LEDs, chopping the feed with PWM can induce distracting flicker visible to other drivers. Now it's been judged time to withdraw the high beam DRL option.

Of course, SAE standards themselves do not carry legal weight; they're not regulations, but consensus-devised descriptions of best practice. U.S. and Canadian regulations still permit high-beam DRLs, and there's no change on that in the foreseeable future. A note at the top of the standard will probably explain that the regulations permit high-beam DRLs, but it is no longer considered as a best practice for use on newly-designed vehicles.

Interior Lighting: Trends to Signature and Personalization

New forms of shared mobility, the electric vehicle, the autonomous car, digitalisation, and connectivity come with new needs regarding car interior lighting. It must enable driving safely, relaxing comfortably, living, or working inside the vehicle. It must also be

more personal and customizable, using different sensors and technologies. Today's status with the 4 targets of interior lighting:

• **Interior lighting as brand identifier and differentiator**
Automakers want to distinguish their cars from the cars of the competitors, from interior lighting as they have done in exterior design with special front grilles, logos, rims, body and window shapes, DRL and rear lamps.

• **Interior lighting for safety, information, communication**
Interior lighting changes from static lamps to dynamic lighting systems. A complementary mix of displays and dynamic interior lighting functions increase the safety of the occupants by more information and communication and intuitive perceptible light warning signals.

• **Personalization and Psychology of Interior Lighting**
Consumer demand is developing for personalised light colours and automatic brightness adaption for a more distinctive and feel-good zone in the car interior.

• **Technology and market aspects for interior lighting**
LED lighting becomes digitised, has a very high power efficiency, and we're seeing rapid innovations in heat management with new technologies and materials and decreasing prices. The number and complexity of light elements in the car interior will increase, as the number of LEDs for interior lighting which would go toward the several-hundred and beyond.

CEA-Innovasonic Partnership for Self-Cleaning Lidar

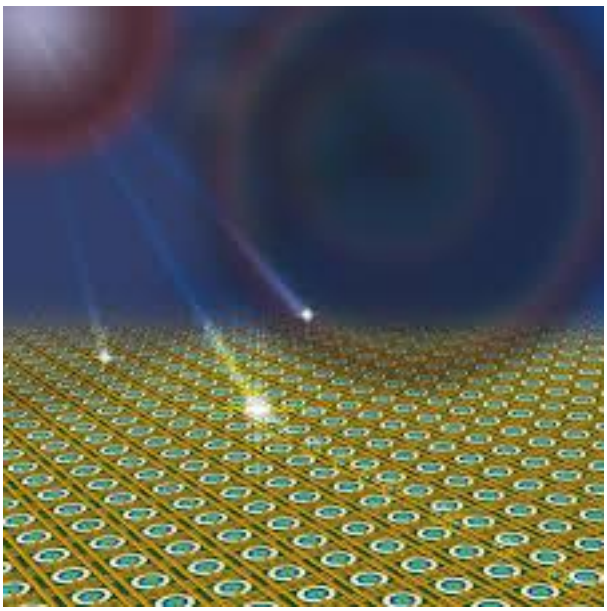
U.S.-based Innovasonic are partnering with the CEA-LETI and CEA-LIST institutes to open a wholly-owned subsidiary in France.

The company chose to work with CEA Tech institutes to leverage their expertise in thin-layer piezoelectric material and their technologies in applied research in microelectronics and nanotechnology. Dr. Boris Kobrin, Founder and CEO of Innovasonic said, "Innovasonic addresses lidar, automotive cameras, and other applications that could benefit from the solution's self-cleaning capabilities."

"CEA-LETI's robotics and piezoelectronics expertise fits right in with our current development efforts to design a new and disruptive sensor cleaning technology for lidars," said Julian Zegelman, Co-Founder and CBO of Innovasonic. "Establishing a subsidiary in France close to numerous European automakers headquarters also

benefits us, as we start discussions with potential commercial partners early in our development cycle."

SPAD-based Photon-Counting Lidar Camera



Researchers have developed the first megapixel photon-counting camera based on new-generation image sensor technology that uses single-photon avalanche diodes (SPADs). The new camera can detect single photons of light at unprecedented speeds, a capability that could advance applications that require fast acquisition of 3D images such as lidar systems for autonomous vehicles.

The research team **published their results** in Optica, The Optical Society's (OSA) journal describing the way of creating one of the smallest SPAD pixels ever with devised and reduced power consumption of each pixel to less than 1 microwatt while maintaining speed and timing precision. The new camera can acquire images at up to 24 kiloframes per second. For comparison, 30 frames per second is the standard rate used to record video for television.

Valeo: Sales down 8% and 16% Outperformance in Q1-2020

16 point outperformance in Q1-2020, acceleration in all geographic areas and Business Groups consolidated sales came in at €4,5 billion down 8%.
All Business Groups outperformed the market, spurred by production start-ups and ramp-ups on numerous hightech innovations, including cameras and other ADAS-related products, and LED lighting systems.

In China, since March, production has gradually resumed at all 34 Group plants.
In Europe and North America, Valeo has adjusted production levels in line with stoppages decided by automaker customers.
Valeo will continue to maintain strict control over costs when operations resume.
€2.3 billion available in undrawn credit lines Valeo has negotiated credit lines for an additional 1 billion euros with its main banks, and therefore currently has €2.3 billio in undrawn credit lines, enabling it to withstand any prolongation of the current crisis.

Jacques Aschenbroich, Valeo's Chairman and CEO, commented: *"During the Covid-19 pandemic, my absolute priority is to protect the health of our employees from the moment operations resume at our plants. We have also implemented drastic cost-cutting and cash preservation measures, and we have sufficient liquidity to withstand any further prolongation of the current crisis."*

Sales by Business Group (in millions of euros)	First-quarter				
	2020	2019	Change in sales	Change in OE sales*	Outperf. vs. IHS**
Comfort & Driving Assistance Systems	886	901	-2%	-2%	+22 pts
Powertrain Systems	1,185	1,266	-6%	-7%	+17 pts
Thermal Systems	1,000	1,143	-13%	-14%	+10 pts
Visibility Systems	1,390	1,502	-8%	-9%	+15 pts
Other***	27	29	-9%	N/A	N/A
TOTAL	**4,488**	**4,841**	**-7%**	**-8%**	**+16 pts**

Change in sales by Business Group

Visibility Systems Business Groups recorded an outperformance in original equipment sales in line with the Group as a whole, driven by LED lighting systems.

Driver Assistance News

Velodyne Lidar's New Ecosystem Partner Program

Velodyne Lidar introduced the Automated with Velodyne program for their integrator ecosystem to commercialise next-generation autonomous solutions using Velodyne's lidar technology. Through the program, Velodyne helps companies by supporting innovation, promoting applications and creating lasting customer and business relationships.

The program reflects Velodyne’s focus on accelerating market adoption of 3D lidar innovations and driving revenue growth for its partners around the world. In addition to a broad portfolio of lidar sensors, Velodyne provide technical, sales and distribution channel service and support. The program includes joint marketing activities to promote partner brands and customer success at trade shows, social and owned media channels, and more.

There are currently close to 40 companies in the Automated with Velodyne program. They have used Velodyne's lidar technologies to build solutions in application areas that include advanced driver assistance (ADAS), autonomous vehicles, mapping, industrial, smart city, drone/unmanned aerial vehicles (UAV), robotics and security.

LeddarTech's Partnership with Sunny Automotive Optech

LeddarTech®

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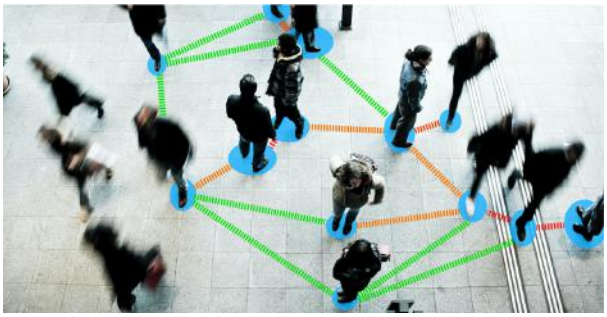
SUNNY AUTOMOTIVE OPTECH

LeddarTech are partnering with Sunny Automotive Optech, a Chinese optical component maker, to create lidar solutions for automotive and mobility applications. Sunny Automotive Optech will provide optical solutions for lidar development as a member of the Leddar Ecosystem.

LeddarTech and Sunny Automotive Optech will initiate this collaboration on front and cocoon lidar optics designs, based on the LeddarEngine. The LeddarEngine is comprised of the LeddarCore LCA3 system-on-chip and LeddarSP signal processing library. The LeddarEngine sets a new standard for the design of integrated and customizable solid-state lidar solutions optimised for autonomous shuttles, robotaxis, delivery vehicle and passenger vehicles. Sunny will contribute towards the automotive platform offering that includes the LeddarEngine by introducing automotive grade optical design and manufacturing services to Tier-1 customers developing lidar solutions.

Lidar Helps Keep Safe Distance in Public Facilities



Lidar sensing technology is now commonly known as a solution for autonomous and automated driving, but the technology also is finding application in a time of the COVID-19 crisis. An indoor motion analysis software developer, iinsider, have released SafeDistance, a free upgrade to the existing iinsider lidar-powered solution for monitoring and analysing crowd density in public spaces.

The software has lidar sensors and 3D perception software from Quanergy to help airport, venue, and facility managers monitor and mitigate crowding and congestion, and maintain safe distancing within their venues.

Lidar sensors are placed throughout venues and facilities to capture the data necessary for SafeDistance to predict or identify overcrowding and trigger an alert to venue and facility managers. SafeDistance allows building management to monitor the effectiveness of customer spacing efforts 24/7 and take the necessary action to preserve safe distancing practices. In addition, historical heat maps that highlight zones where crowd spacing falls below configurable parameters, or real-time spacing between passengers, customers, employees or sports fans can all be track to help manage safe social distancing.

The technology is offered to the company's current customers, including several major airports in the U.S. "We recognise that the world will be a very different place once shelter-at-home mandates are lifted and public venues reopen," said Sam Kamel, CEO of iinside. "We wanted to do our part to help restore the public's confidence in going to the airport, a sports arena, or any other venue. By providing venue and facility managers with real-time crowd density information and predictive analytics, they can take immediate action to uphold proper social spacing."

General News

Auto Output Set to Fall: Forecast

Global light vehicle production is now expected to fall more than 20% to around 71 million units in 2020 as a result of the COVID-19 pandemic and ensuing recession, a top automotive forecaster says.

That steep decline, far greater than anticipated earlier this year, likely will cost global automakers 19 million units in lost production in 2020, according to LMC Automotive, who warned their projections could slip further depending on how quickly major regions recover.

- In North America, where most vehicle production remains shut down in April, automakers have been forced to delay introductions or planned ramp-ups of several new vehicles, including the Tesla Model Y, the Ford Mustang Mach-E, and redesigned versions of Fiat Chrysler's Jeep Grand Cherokee and General Motors' full-size SUVs. The analysts say they expect vehicle sales will bottom out in April in North America and Europe, with post-pandemic recovery "unlikely to be rapid" in the coming months.
- In China, among the first countries hit by the novel coronavirus, the country already has restarted most of its auto plants and now expects to see a sales decline of just 12% this year.

Expectations for a swift economic recovery have plummeted as the virus has swept most of the globe, plunging all major regions into recession, according to researcher IHS Markit.
While the company expects to see the beginnings of an upturn by the end of the year, current projections "are likely to be revised down" as the pandemic plays out.

"Volvo to Look Hard at R&D Projects": CEO Samuelsson

Volvo will thoroughly scrutinise their R&D projects to determine which will survive as they try to recover from the coronavirus crisis. "There are thousands of projects within our R&D and we have to question whether we need to do them all," Volvo CEO Hakan Samuelsson said. Vehicle facelifts are one area where the automaker might cut back, he said. "We need to reduce our cash burn."

Volvo is not alone in making hard choices about their future projects. The coronavirus pandemic will cause automotive research budgets to decline by 17% this year and 12% in 2021, according IHS Markit, who say development budgets also are expected to suffer, dropping 13 percent on average in 2020 and 8 percent in 2021.

IHS Markit's automotive supply chain and technology team surveyed 140 suppliers and automakers in Europe, North America and Asia. 28% of respondents said they expect revenue will be impacted beyond the next 12 months. Respondents also said they expect some R&D activities now outsourced to be brought in-house, especially at midsize and large automakers and suppliers.

Other projects are being postponed. According to the survey, there could be a six-month delay in mature projects and early-stage projects are most likely to be delayed by a year or more. "Electrification, autonomous driving and our future technology development are an absolute priority," Samuelsson said. "Any changes there would jeopardise our strategy, so they will be really safeguarded. I don’t need an explanation on why we should slow down even more or shut down. What we need now are solutions. And if a solution doesn’t work then we need to change things quickly."