



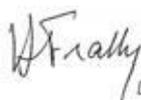
Editorial

GRE: Great Regulatory Evolution

There's been a great deal of lighting regulatory development activity just lately, at the GRE meeting held online at the end of October. Important decisions were made on ADB, road projections, lit logos, new photometric grids, and looking at ways to reduce power consumption and to prepare for the arrival of autonomous vehicles. All these decisions will help the lighting community to propose new functions to improve safety and to open the door to design features. And looking ahead, we're optimistic the regulation on automatic aiming will move forward at the next GRE session, next April.

At the same time, regulations are still on everlasting hold in the USA, and aggrieved reactions within the lighting community are certainly understandable, even if I can't necessarily adopt all of them as official DVN positions. See, for example, this week's analysis by Daniel Stern, whom I consider one of the greatest American experts in lighting. Whether you agree or disagree with him, we can all hope something new and productive will arrive on the US regulatory scene in the coming months. Either way, let's resolve to talk about it at our [next DVN Workshop](#) this coming February in Paris!

Sincerely yours


DVN CEO

In Depth Lighting Technology

It's Not Just Lights: NHTSA's Lag Is Systemic *Analysis by DVN Chief Editor Daniel Stern*



It's been more than a decade since the ADB discussion with NHTSA began, and at this point anyone seeing a light at the end of the tunnel would be on solid ground dismissing it as a hallucination (and if there really is a light at the end of that tunnel, the odds are strong that it's not an adaptive one). In the lighting community, going from optimism to patience... to impatience...to dismay...to anger...to disillusionment...to weary resignation has been much like working through the stages of grief.

In [my keynote](#) at the DVN Workshop near Detroit in September, I made the case that NHTSA's apparent inability to get anything done is not because of a lack of expertise, skill, or will. It is because over half a century ago when traffic safety was a new topic, the auto industry—by which I mean its uppermost executives—having tried and failed to scuttle the very idea of vehicle regulations, set about accomplishing that goal another way: they tied NHTSA's shoelaces together. They got laws and processes adjusted so issuing and strengthening regulations would always be a slow, difficult, expensive process. It's called regulatory capture: the regulated party effectively takes control of their nominally-overseeing agency. This control can be active, with industry operatives writing the regulations themselves, and it can also be passive, with the agency hamstrung and hobbled and unable to get much done.

Lighting, like crash-avoidance more generally, presents special regulatory challenges because the costs of an avoided crash can't be tabulated. They can be estimated and modelled, of course, but one of NHTSA's shackles is the requirement—imposed in a cooperative effort between an anti-regulatory American presidential administration and opportunistic auto industry executives—that every regulatory mandate be justified by stringent cost-benefit analysis, with risk assessment not allowed to substitute for actual costs. A crash that doesn't happen exerts zero costs, and dividing by zero is a mathematical impossibility, so most lighting-related regulatory upgrades are dead before they even hatch. NHTSA's engineers and officers are well aware of this, and it puts a strong thumb on the scales in the direction of *why even bother?*.

We've [previously mused](#) on an idea for how this particular logjam might be cleared, and there are surely other ideas, as well. Could any of them actually do the trick? Maybe or not. But now comes [this](#) from the Associated Press: NHTSA is late on at least *thirteen* auto safety standards, most of them having nothing whatever to do with lighting. That, along with the regulatory-timeframe trend presented in the first link at the beginning of this paragraph, clearly indicates the issue is much broader and deeper than just an aversion to lighting regulations. It starkly shows that sending in petitions and responding to requests for comment offers, at best, the chance to participate in creating an illusion. Much more comprehensive action than that is what got us where we are today; ergo, much more comprehensive action will be required to get us into a better situation.

What does that look like? On an individual level, it means everyone who can—every American—ought to write to their members of congress and squawk about this. Speak up! Not just about ADB or any of the other particular regulations in purgatory, but about the purgatory that NHTSA has become for any and all regulations. Of course, many of us are constrained in what we can say on even implicit behalf of our employer, but every American has the right to write as a private citizen.

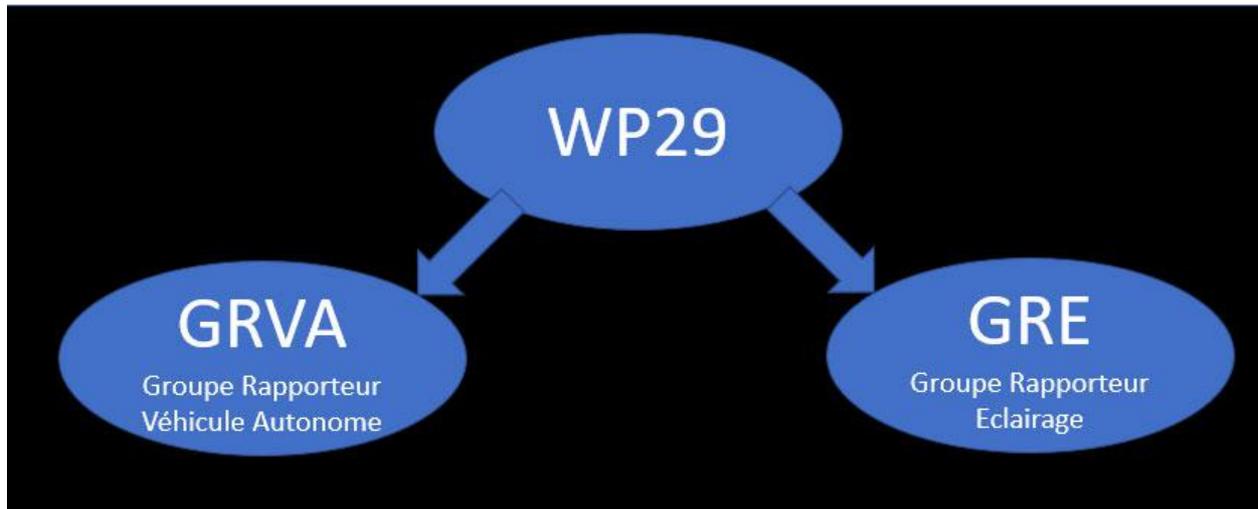
On an industry level, it means a careful re-think is needed of how to interact with government. It's easy to default to resisting regulation on general principle. That leads to what we have now, and it smothers and strangles innovation. Now more than ever, innovation is the primary main driving force of the auto industry, and that means the industry has a vested interest—if only they'll recognise and leverage it—in favouring good, thoughtful regulation.

The regulatory panel discussions are consistently among the most popular features of DVN Workshops. Good ideas and productive intent flow from these sessions. But working out the details of how best to align, harmonise, and synchronise the rules on the American regulatory island with those of the rest of the world—while important—will come to no practical effect if we cannot break the bigger logjam. It is the badly outdated product of a bygone era of safety ignorance, and it must be given a heave-ho and relegated to the scrapheap, where it belongs with the rest of the obsolete practices of the bad old days.

Lighting News

Road Projections Approved by GRE

LIGHTING NEWS



End October, GRE held its 85th session. Important decisions were taken:

The first step for road projections was approved (document **GRE-85-33**) and will be submitted to the WP.29 session in June 2022 for final adoption. These road projections are part of the ADB and a new annex in R48 has been created to list which symbols and patterns are allowed. This is a great news and an important first step. We shall thank GTB and its members from Working Group Front Lighting and Working Group Installation for this great achievement after much workover the last 2 years. This text will open new doors for the future with the possibility to extend to other road projections and signalling projections (GTB Working Group Signal Lighting presented also a document **GRE-85-38** to explain on what they are working and how it could help safety).

A lot of comments were received, showing the interest for this topic.

After more than 2 years of discussion, the final text that opens the possibility to have lit logo was approved during the GRE session (**GRE/2020/5/Rev.2 as amended by GRE-85-26**). Final adoption by WP.29 will also be in June 2022. Lit logos will be allowed with some limitations (size, number, position, part of only certain functions) but will create some new era for designers and car makers, without too much light pollution and advertising, really a good compromise that could explain the duration between the first discussions and the final text.

01 series of R148, R149 and R150 (device regulations) were finally approved after an intensive work done by the SLR group with monthly meeting, with significant modifications and improvements. Especially new photometrical grids for passing-beam and driving-beam with new headlamp classes have been approved.

GTB presented also a document (GRE-85-37) about the willingness to investigate how the lighting community could reduce power consumption in relation with legal requirements. GRE noted with interest this document and GTB will start investigations with universities to see what could be changed in existing lighting functions without reducing safety, especially in some specific conditions (city with street light, traffic jam, platooning, ..)

Discussion still continues about autonomous vehicles and their need for specific light-signalling requirements. GRE is in close contact now with GRVA about this topic. A synthesis was done by the chairman of the AVSR task force (GRE 85-34).

The ongoing debate about Mandatory Automatic Headlamp Levelling continues. GRE did not reach a decision and deferred to the next session in April 2022.

The GRE Documents can be found [HERE](#)

China Works to Bring In Road and Signal Projections

LIGHTING NEWS



In China, three draft proposals for RID (Road illuminating devices); LSD (light signaling devices), and RRD (retro reflective devices) have been published, and authorities are inviting lighting community to provide feedback by 16 of November 2021. These new texts are based on a copy-paste of UN R148, R149 and R150, with some additional requirements. The main differences are:

- Introduction of road projection and signaling projection on the road
- Introduction of lit logos (with only the possibility as a part of position lamp)
- Introduction of AV signaling lamp, mandatory for L³ vehicles
- Modification of the AFS class for low beam. This will create divergence from the UNECE beam; that is never good news, for it always means additional complexity and cost
- Minimum size for stop lamp: not less than 15 cm² of apparent lit area in the direction of the reference axis (it will be interesting to see what results this drives, and compare its effect to the 50 cm² supposedly required by the widely-ignored American EPLLA requirement)
- More performant reversing lamps, inspired by the recent SAE reversing lamp specification upgrade.

The expected implementation date for the new-type lamps is July 2024, and for the new-type vehicles is July 2025

Detailed information is [available online](#), but only in Chinese.

Audi A8's High-End Lights

LIGHTING NEWS



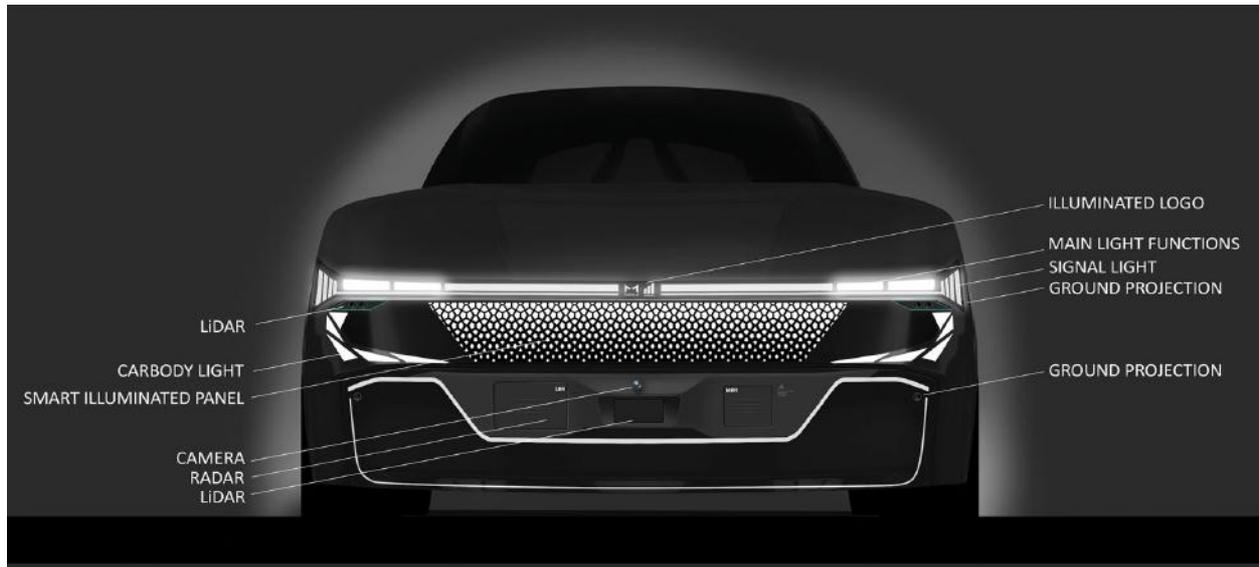
On the newest A8, Digital Matrix LED headlamps with road projection capability use DMD technology, enabling functions like lane and orientation lights for highways, wherein the headlamps provide guidelines or even light the driver's own lane particularly brightly. Above all, this orientation light helps drivers intuitively stay in their lane at road construction sites. At the back of the car, digital OLED tail lights as a standard feature. When ordering the car, there are two rear light signatures to choose.



When the "dynamic" drive mode is chosen, the lights change to a wider signature that is only available in that mode. The digital OLED rear lights have a proximity indication feature: if another vehicle comes within two metres of a stationary A8 from behind, all the OLED segments are activated. Additional functions include dynamic turn signals as well as welcome/farewell sequences. Even the interior of the car gets in on the action; reading lights in the rear use matrix LED technology to put light where individual passengers want it, without disturbing others.

Plastics Bring Solutions in Automotive Lighting

LIGHTING NEWS



PARTS WHERE MARELLI AND SAMVARDHANA MOTHERSON ARE WORKING TOGETHER

Marelli and Samvardhana Motherson have formed a new partnership to integrate sensors for ADAS and autonomous driving in illuminated exterior body parts like front grilles, bumpers and others. The partnership plans to create translucent, back-lit trim parts and other decorative panels, with LED lighting shining through them at night and taking on the color of the car body in daylight.

- **Motherson** uses injection molding, films, printing technologies and painting and surface coating to integrate light modules into large exterior parts like bumpers and fascias. The integration of the light sources within the exterior parts is the key for a successful product" Timo Schwarz, chief technology officer at Motherson Innovations. said.

- **Marelli's lighting division** will focus on automotive lighting and sensors integration. «The company applied a similar concept in its Smart Corner product, which integrates sensors for autonomous driving within vehicle headlamps and tail lamps. Andrea Stella, senior VP of R&D at Marelli Automotive Lighting said.

"Driving innovation and shaping the future of mobility together with our customers requires not only the ability to best respond to their current needs, but most of all the ability to anticipate forthcoming evolutions and rising market trends." Sylvain Dubois, CEO of Marelli's Automotive Lighting division, said.

Christian Päschel is New Varroc Lighting CEO

LIGHTING NEWS



Varroc have appointed Christian Päschel as the new CEO of Varroc Lighting Systems. Päschel, previously with Hella as member of the executive board and head of vehicle lighting sales, has over 20 years' experience in the automotive industry – particularly in the lighting and electronics sector, where he has held senior management positions with a focus on strategic development and sales.

Commenting on his new role, Päschel said: "The whole automotive segment is facing a very challenging period and we need to focus on making sure that our company is well prepared for the challenges ahead. In my new role, I would like to focus, in particular, on process optimisation, digitalisation and investments that will enable us to respond flexibly to customer needs and to strengthen our position in lighting and electronics in line with current trends within the automotive industry".

ZKW Use Annotell for Perception Development

LIGHTING NEWS



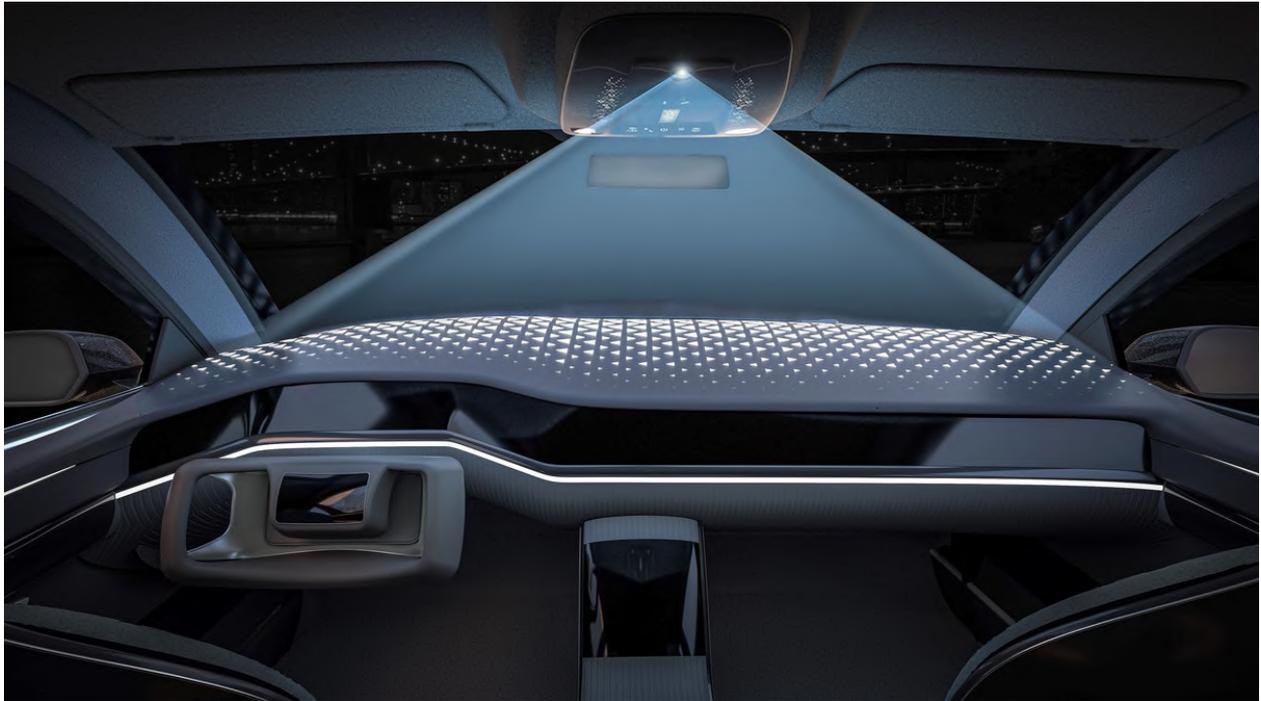
ZKW want light to go beyond its see-and-be-seen functions and become more of a communication device with the greater world, such as pedestrians and drivers of non-autonomous vehicles. Display of braking paths, projection of pedestrian crossings on the road, display signage—all of this to help autonomous vehicles communicate with their analog environment, to make sure people see and understand cars and to make the traffic of the future accident-free.

Annotell have provided ZKW with a solid process to regularly review the outcome, talk about possible improvements in relation to the guidelines, and evaluate the type of data ZKW needed to focus on going forward.

By taking a wider approach to the problem, ZKW can get better results quickly while lowering the amount of work needed. They make sure to not only look at the result of the annotation, but also fine tune the best approach to handle the amount of data afterwards. *Annotell develop safe perception systems, as a ground-truth and perception analytics company with a strong focus on the AD/ADAS industry, aiming to deliver a vertically integrated platform designed to make safe perception possible.*

AMS Osram's New Overhead Light Console

LIGHTING NEWS



AMS OSRAM IMAGE

With the aim of personalized lighting design, AMS Osram, thin-film technology company Kurz, and plastics manufacturer Syntech Plastics have developed a new overhead light console. This complete solution is based on the combined expertise of the project partners in smart lighting, plastic processing and injection molding. Together, they have produced a modern, fully enclosed lighting element with an elegant, decorative look.

The console has matrix LED spots for reading lights which can be adjusted for intensity and white tone. The module also offers a wide range of welcome and entertainment scenarios across the full RGB color palette. The static or semi-dynamic projector in the module can project individual motifs on various surfaces to convey information or produce patterns or animations. The animations integrated in the module are matched to the design of the decorative surface and can be adapted to different driving situations or vehicle interactions. The light structures in the decor are invisible when inactive; they light up only when, for example, an incoming call is received—and always in keeping with the ambient lighting. The overhead light console therefore offers a wide range of options for customizing the entire front section of the passenger compartment.

The console has a fully integrated, capacitive touch sensor system that replaces conventional buttons, providing a seamless user interface. Particularly noteworthy is the high transparency of the touch sensor system, which lies directly above the matrix luminaire so its light shines through it, which means it can be intuitively activated by touching the opening. Thanks to its ease of integration, the overhead light console can be readily extended with additional functionality such as haptic feedback via a piezo actuator, proof control and a handsfree function for more complex applications.

AMS Osram Automotive Lighting Systems, created this year and headquartered in Munich, is an independent division of AMS Osram's automotive business unit. They combine lighting technology with electronics and software to develop smart, innovative lighting solutions for the automotive industry.

Driver Assistance News

Daimler Invest in Lidar Startup Luminar

DRIVER ASSISTANCE NEWS



Daimler Mercedes-Benz

Daimler's truck unit will put money into laser-sensor startup Luminar to bolster the development of self-driving trucks in America, less than a week after striking a deal to use driverless technology from Waymo in their Freightliner Cascadia trucks to be sold to North American customers.

Daimler Truck will take a minority stake in Luminar Technologies, joining other investors including Volvo Car in a round of equity financing ahead of the startup's public-market debut. Bas du formulaire

Daimler plan to augment their in-house automated heavy-truck development efforts with technology from Luminar, who make lidar sensors to allow a vehicle to "see" its surroundings.

"We definitely see there are bigger chances in trucking" than robotaxis for deploying driverless technology, said Peter Vaughan Schmidt, head of autonomous technology at Daimler Trucks. "The business opportunity is bigger and the problem you have to solve is easier."

Dieter Zetsche, who stepped down as Daimler's CEO last year, will chair a council of auto executives that will help Luminar make deeper inroads in the industry. Matt Simoncini, a Luminar board member and former CEO of Lear Corporation, will also be on the council.

Luminar plan to complete their \$3.4bn merger with special purpose acquisition company Gores Metropoulos and go public in early December.

Hokuyo, SiLC Partner to Boost FMCW Single Chip Tech

DRIVER ASSISTANCE NEWS



Hokuyo are joining up with SiLC Technologies to bring SiLC's 4D+ smart vision chip into mass production. Over the years, Hokuyo have put out a wide array of lidar and obstacle detection devices to address the many challenges in improving autonomous vehicles' perception capabilities. With the clientele and the extensive lidar and obstacle detection portfolio of Hokuyo, SiLC could reach mass production.

SiLC have developed the industry's first fully integrated coherent 4D lidar chip based on laser technology using FMCW. Through 4D, a device could involve polarization intensity, distance/range, and resolution to allow for machine sensory to get closer to matching human perception.

The technology behind the 4D+ vision chip integrates all required lidar functionality, such as a coherent light source and optical signal processing. However, SiLC's solution also enables additional information extracted from the returning photons before converting to electrons.

The transmitted and received optical wavelengths travel through coherent mixing and amplification detector that blocks lidar interference such as light refractions and sunlight. This photodetector then conducts a fast fourier transformation to have the range and velocity signals extracted from the received waveform.

By introducing 4D solutions, the wavelengths push 1550 nm, improving eye safety and mitigating solar interference. Calculating the range or distance of an object is a direct function of the frequency shift of the returning signal, while velocity adds the frequency shift of the returning signal. However, if they travel simultaneously, called a 'dual chirp,' this resolves range and velocity. Additionally, the FMCW operates lower than a 1 kW of power than pulsed 3D lidar, operating at 1550 nm wavelength, which increases eye safety and avoids the challenges of operating in daylight.

Lumentum to acquire NeoPhotonics for \$900M

DRIVER ASSISTANCE NEWS



Lumentum, the Silicon Valley photonics giant, has revealed plans to acquire rival NeoPhotonics. The proposed all-cash deal values NeoPhotonics at \$918m, and would boost Lumentum's offering across the optical communications sector. With its latest move, Lumentum appears to be doubling down on the opportunity in optical communications, rather than pursuing the broader diversification strategy implied by the Coherent acquisition bid.

In an investor presentation by Lumentum and NeoPhotonics, the two firms stressed the complementary nature of their respective product lines.

- NeoPhotonics, which is wholly focused on photonic components used in cloud computing and optical networking applications, sells external-cavity tunable lasers, silicon photonics components and transceivers, and high-speed coherent modules, alongside a range of passive components and radio-frequency driver chips.
- Lumentum is more diversified, with cloud and networking applications accounting for around 60% of its sales. Among its key product lines are reconfigurable optical add-drop multiplexers (ROADMs) and components and modules based on indium phosphide (InP) integrated circuits.

Most of the remaining 40% of Lumentum's sales come from 3D sensing and lidar applications, alongside fiber lasers used in materials processing.

The 2 companies believe that the total addressable market for those combined product lines amounts to some \$20 billion, with the market for components and modules operating at 400 Gb/s and faster expected to ramp quickly as demand for bandwidth continues its inexorable rise.

General News

ams Osram Reports 'Robust' Q3 Results

GENERAL NEWS



ams Osram has this week reported its Q3 group financial results. “Despite continuing supply chain imbalances, our automotive business was strong while our consumer business contributed attractively in line with expectations,” commented CEO Alexander Everke. Q3 group revenues was \$1.52B, up 4% sequentially compared to Q2, 2021 and up 6% on Q3, 2020.

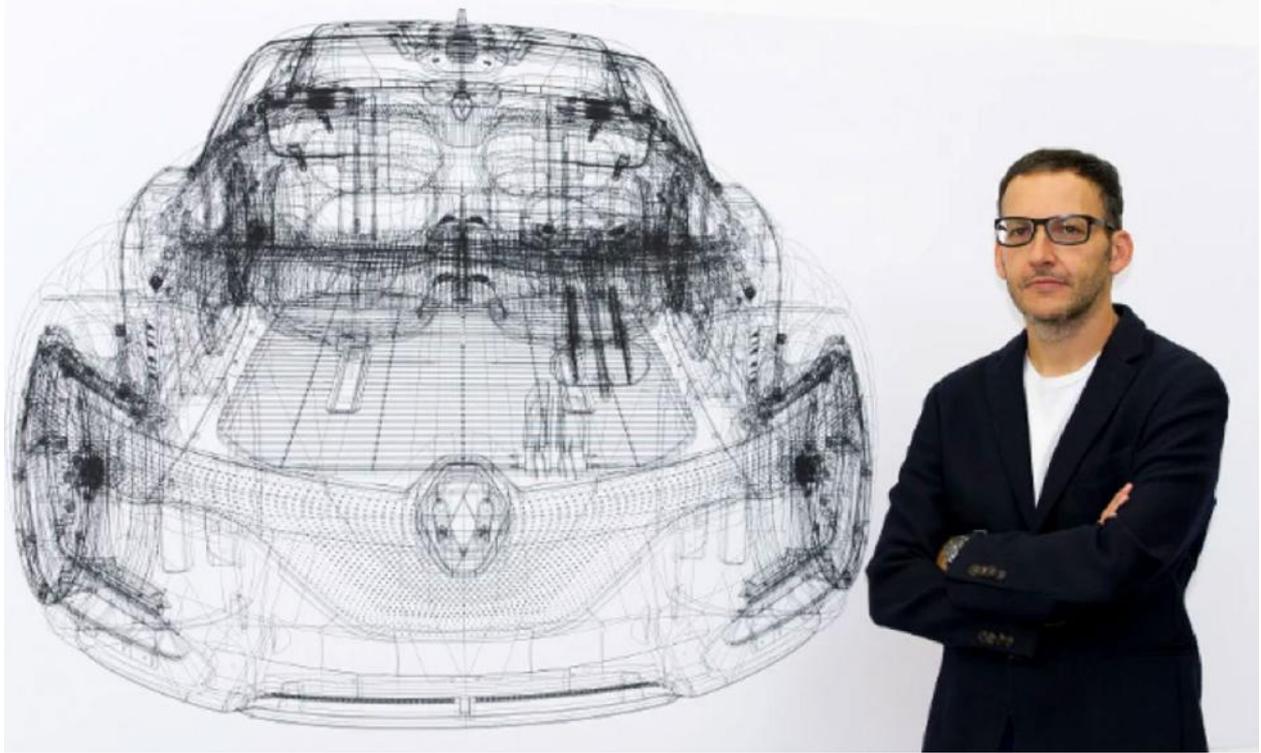
The group’s Semiconductors segment contributed strongly to group performance generating 67% of revenues in Q3, 2021, combined with a healthy adjusted operating margin of 13%. In this segment, the automotive market area recorded what ams Osram called “very positive results driven by available backlog.”

The Lamps & Systems segment showed an overall positive development in Q3, contributing 33% of revenues. Market traction for LED retrofit solutions continues to increase.

For Q4, the company is expecting group revenues of \$1.4B, and an expected adjusted operating margin of 8-11%.

Former Renault designer joins GAC

GENERAL NEWS



Chinese automaker GAC has hired Stephane Janin, former design director of concept vehicles at Renault Group, as director of its advanced design center.

Janin has also been appointed director of its European advanced design center, the state-owned automaker said this week.

GAC said it has tentatively decided to establish the European advanced design center in Milan, Italy.

GAC, based in the south China city of Guangzhou, operates design centers in Guangzhou, Shanghai and Los Angeles.