



## Editorial

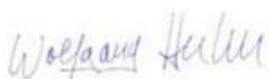
### Opel's Pure-Function, Invisible Light Panel

DVN was invited to talk with Ingolf Schneider, Thomas Feid and Philipp Röckl from Opel lighting team, about actual and future lighting. As nearly all other big companies Opel was nearly empty, nobody was visible in the long aisles. Only a few people did work in the huge offices of the development center. The parking spots for thousands of cars were all free. I was the only visitor at the entrance gate where normally queues of suppliers and other partners wait for their visitor badge. I really hope that this Corona phase has an end soon.

Opel introduced a week ago the concept car Manta E-Mod with a complete new lighting concept. The lighting is hidden behind a black "Vizor" which is in fact a big front display with a lot of pixels. The pixels are Osram LEDs embedded into a 2.5D plastic screen. The headlamps are not any more sculptural elements, but a part of the body surface, visible when lit. The idea is that only the function is visible, no bezels, no reflectors, no lenses, no mechanical elements at all.

If we follow this idea consequently, designers have a completely new and additional job definition in future. The visible functions are 100% software defined, different design knowledge is needed then. The design of functions and communication must be created instead of bezels and reflectors, this means Know How about HMI and User Experience is necessary. The big area of the Vizor is used - I guess - about 25% for lighting functions and 75% for communication. This functions and the communication is flat, no three dimensional sculptures but flat, digital elements. A tremendous change.

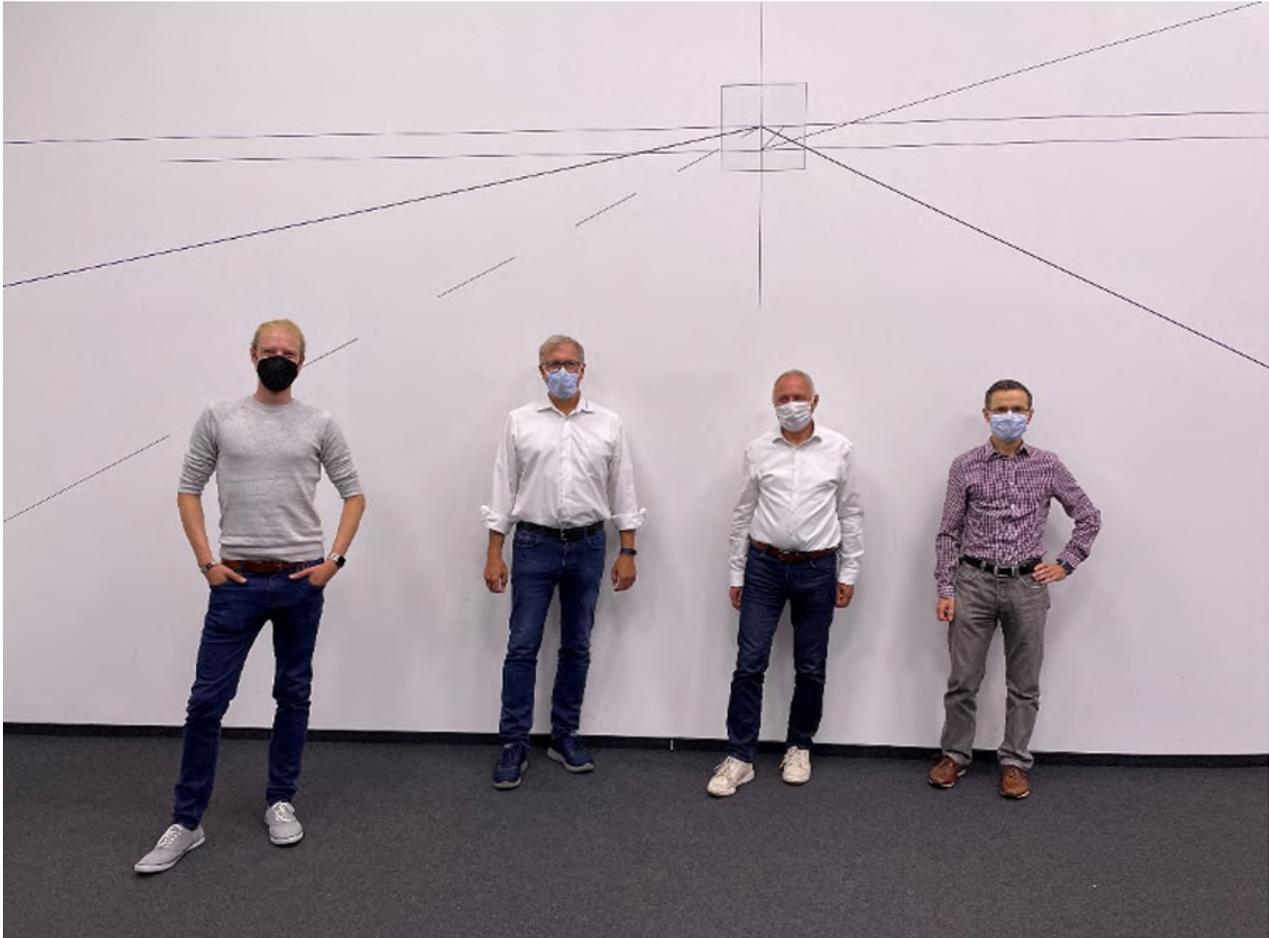
Similar integrations we have seen as so called shy tech in other, mainly Japanese interior and exterior studies, but not as consequent as Opel shows in the Manta E-Mod. This idea can be the next big change in automotive lighting, especially for the 1<sup>st</sup> and also 2<sup>nd</sup> tier suppliers and the lamp designer in the OEM's design departments.



Wolfgang Huhn  
DVN Senior Adviser

# In Depth Lighting Technology

## Three Main Lighting Trends: Opel Lighting Team



FROM LEFT TO RIGHT: PHILIPP RÖCKL, INGOLF SCHNEIDER, WOLFGANG HUHN, THOMAS FEID

DVN's Wolfgang Huhn talked about general new lighting trends and specific Opel innovations, with the Opel team Ingolf Schneider, head of Opel lighting development, Philipp Röckl, manager for pre-development, Thomas Feid, project manager lighting.

The first one is, that Stylists from nearly all OEMs are pushing for headlamps and rear lights with **small light emitting surfaces**. This trend has become stronger in recent years and at this point of time approaches a level, where not only psychological glaring is a problem, but even eye damage limits have to be taken into account. Example: baby lying in a stroller, watching directly in the high luminance LED beam. Of course, engineering has to exclude any problem in this point.

A second trend is **road projections**. As soon as regulatory direction is clear, road projections will become more prominent. Today road projection is realized with the DLP technology. Main technology driver in near future will be Micro-LEDs with about 20 K pixel count. A special attention to the Head Up Display (HUD) is necessary to avoid conflicts or inconsistencies between the road projection and the HUD. Opel suggests the core area of projection in the direction of the right rim of the road. Many new cars will have a 84 pixel ADB system, next step is clearly the micro LED technology which opens the field of road projections also for generalists projects.

As a third trend are **illuminated features like lit logos or front grilles**. They will get a lot of attention. Car buyers tend to spend more money for such very visible "functions" than for safety functions as e.g. ADB.



OPEL MANTA E-MOD WITH MESSAGES IN THE FRONT

The latest Opel Manta E-Mod concept car shows a new “function only” trend, which is a real visionary approach. A completely invisible lighting system which becomes alive when switched on. No three-dimensional headlamp sculptures any more, but two dimensional and purely digital functions e. g. as DRL-signature and communication pixel array. Osram LEDs with 2 mm pixel pitch and high luminance were used and embedded into a plastic part which was built by an exterior plastic components maker and not by a classical headlamp maker. Mayor problem is the huge tools which are necessary to manufacture such a Vizor without any gap, like design wants. 1m or may be 1,10 m wide elements are feasible in one piece, but not 1,80 m parts which are needed. This seems to be a really nice and difficult engineering challenge.

The Vizor concept is a big step in design and technology. The first step to such a concept was seen in the Mokka and it is also expected in the new Astra, as sneak preview photos show at the Opel pressroom website.



ASTRA HEADLAMP WITH NON-VISIBLE LIGHTING SYSTEM

The Opel lighting team has an important position inside the Stellantis group. Opel was the first brand to introduce Matrix ADB headlamps in all car lines to improve night time driving safety by using latest technology.

# Lighting News

## DVN Workshop Registration is Open

LIGHTING NEWS



This coming 21-22 September, the [DVN US Workshop 2021](#) will take place near Detroit in Novi, Michigan—a real, live, face-to-face event with acclaimed speakers and a large spread of expo. The rubric of the workshop is **How to Save Lives in Nighttime Driving**, with topics including driver monitoring, ADB, LED, microLED, lighting performance assessment, simulation, advanced materials, aiming, testing, and measurements.

Presenters from Audi, Ford, GM, Jaguar Land Rover, and Volvo will talk about their achievements and ideas to improve safety, followed by lighting suppliers Koito/NAL, Hella, Magna, Marelli AL, Valeo, Varroc, Lumileds, Osram, Samsung, Kyocera SLD Laser, and innovative technology enablers.

A regulatory session will address questions of how to meet the needs of type approval, self-certification, and other mandatory standards, and will explore how we can make progress to develop testing requirements for adaptive lighting that can be adopted by all nations irrespective of their regulatory regimes.

For registration and expo booth and sponsorship opportunities, contact DVN's [Salomon Berner](#).

# Grille Designers Stretch Out in EV Space

LIGHTING NEWS



EV architecture is freeing designers from constraints that have for many decades defined what automobiles look like. Because there's no radiator up there in an EV, designers now have a big new space on the front of the car for branding, marketing, and messaging.

New EVs also present an opportunity to design with light to give front ends greater flair and differentiation. LEDs and other new lighting technologies give designers new possibilities to shape and position the headlamps, to add new kinds of lights, to put on illuminated logos—all in all, to better advertise to the world "This is an EV".



Mercedes' new EQS sedan, for example, uses front-end lighting to distinguish its image and dress up the fascia. An LED light band spans the entire front of the car.



Hyundai Mobis, for their part, have developed a "lighting grille" to turn the entire front end of a vehicle into an integrated lighting module for communicating with other vehicles or pedestrians.



And Nissan call the front fascia on their forthcoming Ariya EV a "shield," full of sensors, bordered by diagonal light bars, and featuring an illuminated logo. But it still uses the traditional V-shape of grilles on Nissan's combustion-engine vehicles.



GMC's new Hummer EVs have six block-shaped lights, each bearing one letter to spell out the name across the front. There's also a large lower grille with a more traditional look.

# 2022 Paris Automotive Week: 17-23 Oct. – VISION

## Same period tbd

### LIGHTING NEWS



The two flagship shows of the French automotive industry are joining forces through a common event in 2022, called Paris Automotive Week, which will be held from **October 17 to 23**. A salutary merger for Equip Auto, which will gain visibility and attractiveness in the face of heavy competition from Automechanika.

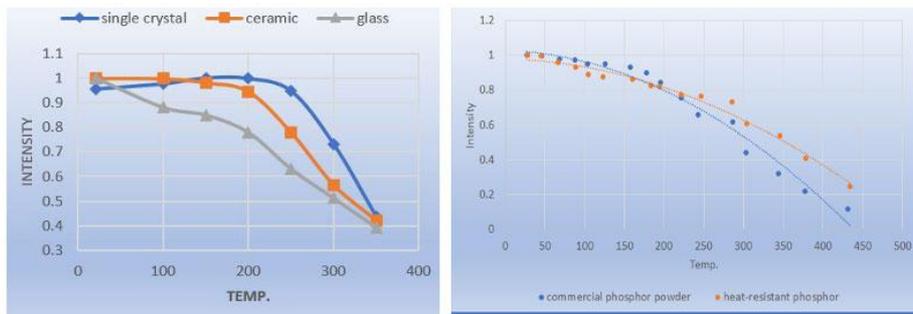
“After two years of a pandemic, faced with the historic challenges facing the automotive industry, bringing us together in one place has become obvious to us”, indicate Luc Chatel, president of the PFA, organiser of Paris Auto Show and Claude Cham, president of SAS Equip Auto.

«For a week, Paris will thus become the showcase, the laboratory and the forum for the automobile and mobility systems of the 21st century. While remaining true to their fundamentals, the two shows had to build this new international event, open to the general public, professionals and decision-makers" said the two presidents.

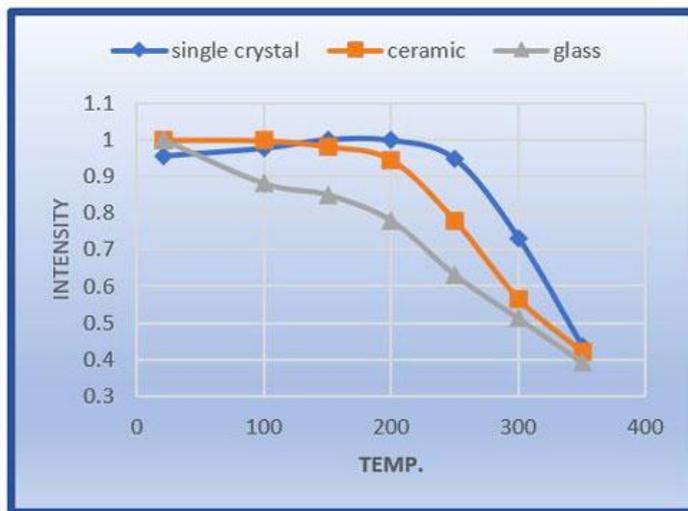
A series of events, “inspirational” speeches and tests will be organized on both the general public and the pro side. It remains to be seen how this whole ensemble will be organized, especially between the various exhibition halls.

# Taiwan Applied Crystal's Low-Quench Phosphor

## LIGHTING NEWS

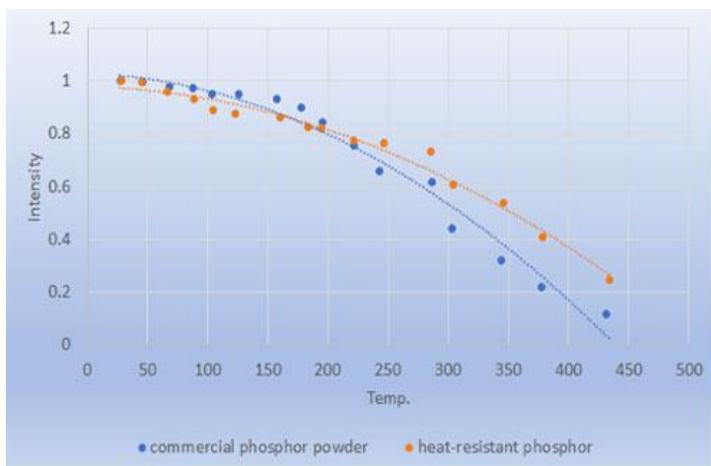


Laser headlamps and projectors have pushed the frontiers of high-end illumination over the past decade. Initially, white light was created by using laser diodes and Cerium Yttrium Aluminum Garnet fluorescent ceramics. As laser power rises, the heat increases and deteriorates the quantum conversion efficiency of the fluorescent material—it's called thermal quenching, and it reduces light output.



INTENSITY: CRYSTAL, GLASS, CERAMICS

Taiwan Applied Crystal have developed a heat-resistant phosphor. At operating temperatures above 200 °C, its luminous intensity is up to 20 per cent higher than conventional phosphors.



ABOVE 200°C, LUMINOUS INTENSITY IS  $\geq$ 20% HIGHER

The new heat-resistant phosphors have better quantum efficiency and luminous intensity, which allows lighting devices with laser diodes to successfully replace LED-based lighting easily and affordably.

# Magna's Employee Education Program

## LIGHTING NEWS



Automotive supplier Magna International are partnering with work force education provider InStride to launch a pilot program that will provide qualified employees access to debt-free undergraduate degree programs. The initiative, called Educational Pathways for Innovative Careers (EPIC), will be available for U.S.-based employees beginning this month.

The program will provide coursework that lets employees address the skills they'll need to keep up with continued advances in the auto industry. The goal is for employees to expand their knowledge and skills so more advanced vehicles can be designed and built.

Magna Chief Human Resources Officer Aaron McCarthy says "The mobility industry is transforming rapidly and in need of ever-changing skill sets to meet new demands. As vehicles change, the way we design and build them will be drastically different, requiring employees to expand their knowledge in order to maintain our company's competitive advantage".

Magna, headquartered in Ontario, Canada, are the № 4 auto supplier, with global parts sales to automakers of \$32bn in the 2020 fiscal year.

In lighting, several universities are able to provide coursework as TUD in Germany, LRC in US, or ELS in France.

# Knorr-Bremse Back Off From Hella

LIGHTING NEWS



Truck and train brake maker Knorr-Bremse have withdrawn from the group of bidders for Hella, citing a "reassessment of the possible synergies"; after a detailed examination of products and technologies, K-B's Munich-based management concluded the achievable advantages of an acquisition were not sufficient.

Shortly ago at the end of June, K-B expressed "fundamental interest in the possible acquisition of around 60 per cent of the shares in Hella (...) from members of the founding family". Investors, however, didn't like it; Knorr-Bremse shares lost around a fifth of their value. Just hours after the plans were canceled, K-B stocks went up after the trading hours, and the nexts day they also made substantial gains in main trading.

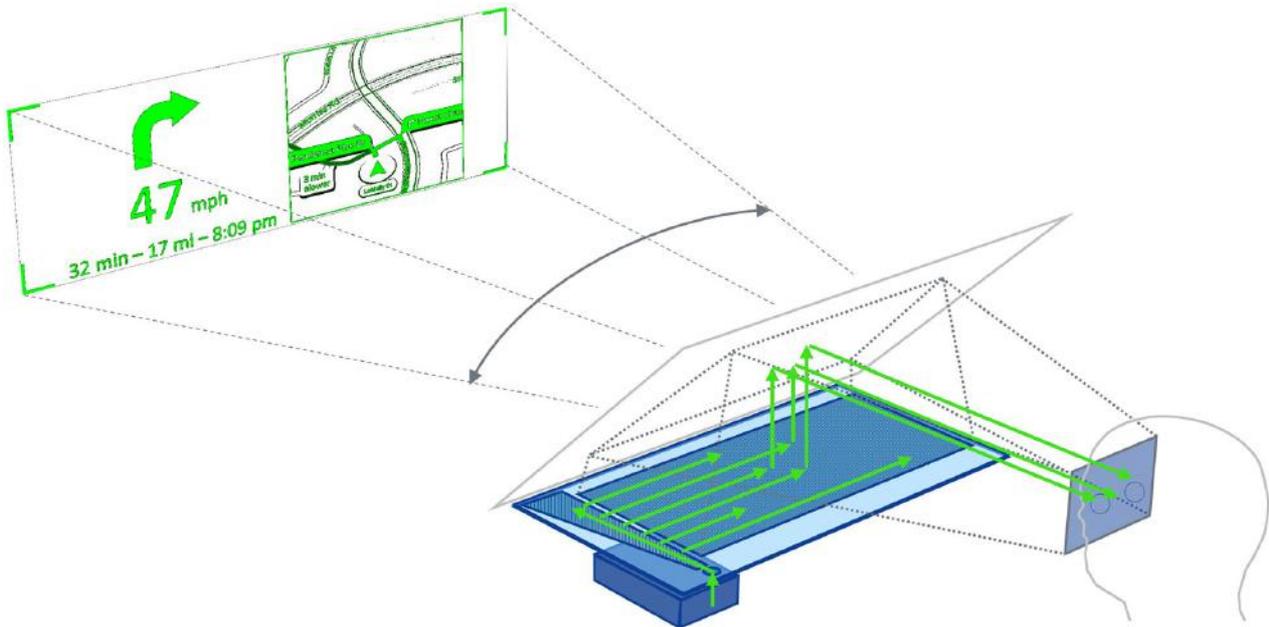
So, K-B management have given in. A takeover would not create sufficient additional value for the shareholders, said CEO Jan Mrosik. Hella are open to acquisitions, but "the opportunities for a possible transfer of competencies, especially in the commercial vehicle sector, have not been sufficiently confirmed for us", Mrosik said.

Auto suppliers Hasco and Faurecia are also considering bids.

# Driver Assistance News

## AR-HUDs are Next Step Up for Smart Vehicles

### DRIVER ASSISTANCE NEWS



A USER-FRIENDLY AR HUD WOULD PROJECT VIRTUAL IMAGES AT MULTIPLE FOCAL DISTANCES.

The fusion of Augmented reality (AR) along with the latest innovation in head-up display (HUD) is set to revolutionise the motoring experience. HUD technology is still young. Based on bulky conventional optics and restricted data processing, today's HUDs can only project tiny images on the windscreen directly above the steering wheel, providing rudimentary information such as direction and speed. They fail to take advantage of data generated by the sensors to create genuine human machine interfaces (HMIs).

What's more, the images projected by a standard HUD compel drivers to focus their eyes at a very short focal distance of only a few metres, potentially distracting them and making it almost impossible to simultaneously look at the HUD and pay attention to the road ahead.

A user-friendly AR-HUD could project virtual images, graphics, and text at multiple focal distances, creating an illusion of the cues being a natural extension of the real world. It would perform substantially better at providing guidance navigation, hazard avoidance, location updates, and spontaneous interaction with physical objects. By placing graphics into the driver's field of view, AR-HUDs will significantly boost situational awareness.

For instance, ADAS alerts are generally conveyed by an audible alarm or a blinking symbol. An AR-HUD can identify a potential safety hazard, such as a pedestrian or a piece of debris, and seamlessly mark it for the driver.

The biggest obstacle to combining AR with HUDs is presently the size requirement of conventional optics, imposed by fundamental physics. If one wants to increase the field of view or image size, the physical dimensions of the HUD would increase exponentially, making an AR-capable unit too bulky to be accommodated behind the dashboard.

Nokia Bell Labs' new innovation on that front could be exactly the needed breakthrough: they've developed large waveguides with nanoscale gratings, using high refractive index materials that help pave the way for AR-HUDs. The new technology, already employed in wearable AR glasses, would substantially increase the virtual image size and project to infinite or multiple focal distances without changing the volume of the unit itself.

# Finkelstein is New AEye R&D Chief

## DRIVER ASSISTANCE NEWS



High-performance active lidar specialists AEye have appointed Hod Finkelstein as Chief R&D Officer. A technology and business veteran, Finkelstein brings deep experience spearheading technological development and commercialisation.

Finkelstein joins AEye from Sense Photonics, where as CTO he defined the company's technology direction and led their lidar development activities. He started his career at Intel, designing the early Pentium chips, and was in charge of semiconductor technologies at Mellanox Technologies. During his PhD, he invented the first generic CMOS Single-Photon-Avalanche-Diodes (SPADs), which are widely used in lidars today, and first demonstrated arrays of these devices.

AEye promote their iDAR™ active lidar system as impervious to the drawbacks of conventional lidar. iDAR is based on a bi-static architecture, which keeps the transmit and receive channels separate: as each laser pulse is transmitted, the solid-state receiver is told where and when to look for its return, enabling deterministic artificial intelligence to be introduced into the sensing process at the point of acquisition.

*[AEye](#) are a premier provider of high-performance, active lidar systems for vehicle autonomy, ADAS, and robotic vision applications. AEye's AI-enabled and software-definable iDAR™ (Intelligent Detection and Ranging) platform combines solid-state active lidar, an optionally fused low-light HD camera, and integrated deterministic artificial intelligence to capture more intelligent information with less data, enabling faster, more accurate, and more reliable perception.*

# General News

## Porsche, Rimac JV Will Run Bugatti

GENERAL NEWS



Volkswagen Group's Porsche division plan to form a joint venture called Bugatti-Rimac with Croatia's Rimac Automobili to run VW's Bugatti brand. Rimac will own 55 per cent of the JV; Porsche 45 per cent. The new entity will be established late this year, and will be based in Zagreb, Croatia.

VW Group will transfer Bugatti to the venture, and Rimac CEO Mate Rimac will lead the JV. "We are combining Bugatti's strong expertise in the hypercar business with Rimac's tremendous innovative strength in the highly promising field of electric mobility," Porsche CEO and VW Group board member Oliver Blume said. Two hypercar models will be produced by the joint venture: the Bugatti Chiron and the full-electric Rimac Nevera. All Bugatti models will continue to be produced at the brand's factory in Molsheim, France.

# Tesla Ship Over 200k Cars in Q2

GENERAL NEWS



Tesla delivered a record 201,250 cars worldwide in the second quarter. While the company don't break out sales by region, business appears healthy in China despite the deteriorating relationship between Tesla and the Chinese government. The bulk of the period's sales were of the Model 3 sedan and the Model Y crossover.

Quarterly deliveries are one of the most closely watched indicators for Tesla. They underpin the company's financial results, and are widely seen as a barometer of consumer demand for electric vehicles generally because Tesla are the market leader in battery-powered cars.

# Stellantis: €30 billion for Electrification and Software

GENERAL NEWS



Stellantis intends 70% of its sales in Europe and over 40% in the U.S. to be low-emission vehicles by 2030. All 14 brands in the Stellantis portfolio are in line to offer fully electrified solutions with ranges of 300 to 500 miles.

Stellantis plans to invest more than €30 billion through 2025 in electrification and software to create new battery-electric vehicles, ranging from pickup trucks to muscle cars, for its entire portfolio of 14 brands.

The investments in electrification will deliver returns 30% better than the industry average while creating four new battery-electric platforms, Tavares tells investors during Stellantis' virtual "EV Day" presentation.

The key financial goal is for the electrification strategy, which covers brands including Dodge, Jeep, Ram, Chrysler, Fiat, Opel, Alfa Romeo and Lancia, to produce double-digit returns by 2026, Tavares says

Stellantis' newly unveiled plans call for creation of a dedicated software division and the construction of three "gigafactories" to build batteries for the new electrified vehicles it will begin putting on the road in 2023, Tavares says.

The automaker intends 70% of its sales in Europe and over 40% in the U.S. to be low-emission vehicles by 2030. All 14 brands in the Stellantis portfolio are in line to offer fully electrified solutions with ranges of 300 to 500 miles (483 to 805 km) and fast charging capability of 20 miles (32 km) per minute.

The four platforms include one designed specifically for small vehicles with a range of up to 300 miles. The STLA medium platform will have a range of 440 miles (708 km), while the STLA large platform with a range of 500 miles will serve as the basis for everything from a midsize pickup truck to a Jeep SUV or Dodge muscle car, according to Ralph Gilles, Stellantis' chief design officer.

# VW's Diess receives a contract extension until 2025

## GENERAL NEWS



VW boss Herbert Diess receives the contract extension he has requested.

The supervisory board approved a new contract with the CEO on Friday. Instead of April 2023, it will now run until October 2025.

Last Friday, the VW boss received the long-awaited early contract extension from the supervisory board. Not a full five-year term, but at least two years. Instead of running until 2023, his contract now runs until 2025.

Diess will now remain CEO until his 67th birthday in October 2025. This provides for his new contract, which the supervisory board approved last week after hours of deliberation. His previous contract actually expired in April 2023. With the extension, Diess exceeded the age limit of 65 actually applicable at VW. A two-thirds majority on the supervisory board was required for an exception. This could not be achieved without the consent of the employee representatives.

"Herbert Diess and his management team have successfully advanced the transformation of the group together with employee representatives over the past few years," said supervisory board chairman Hans Dieter Pötsch after the vote. "The Supervisory Board also sees the best conditions for the continued successful development of the entire company in the coming years under the leadership of Dr. Diess, especially with a view to Strategy 2030."