Tue, 25 June 2024
Weekly Newsletter

DVN Lighting

NEWSLETTER #861

Editorial

Night Drive In Bavarian Forest

Three weeks ago, I visited Audi's R&D centre in Ingolstadt to try out the new Q6 e-tron and took time to discuss technology with Stephen Berlitz and Michael Kruppa's team.

Like a normal lighting engineer, I started with a night drive in Bavarian forest. Audi are lucky: drive 5 km and you are in the fully dark forest, perfect for a night drive. You have curvy roads, hills, and animals to detect. When you drive this sort of road, you understand why you need a powerful low beam (wide) and high beam (range). The two modules are clearly doing the job even though they're just 25 millimetres high.
On the video you can see the benefit of the very wide high beam (37 degrees outboard): the high beam field of illumination corresponds to your eye's field of view, limited by the A-pillar. Perfect! a must-have for safety and comfort.

You also understand the importance of powerful headlamps we have in Europe. I found similar roads in Sweden when I was working for Volvo Cars and it is not a surprise why European automakers, especially from northern Europe, prioritize lighting performance. Road and environmental conditions can be dangerous, and you need a good light!

Have a look at my detailed article in this week's DVNewsletter all about my test of the Q6 e-tron. And feel free to go see the videos from the Michigan DVN Workshop, and read our complete report on that event.

Sincerely yours,

Paul-Henri Matha
DVN Chief Operating Officer and Lighting General Editor

In Depth Lighting Technology

DVN Field Trip: New Audi Q6 e-tron at Ingolstadt

By Paul-Henri Matha, DVN COO & Lighting General Editor

I was invited by Stephan Berlitz and Michael Kruppa to visit Audi's R&D lighting team to discover the new Q6 e-tron and its lighting innovations.

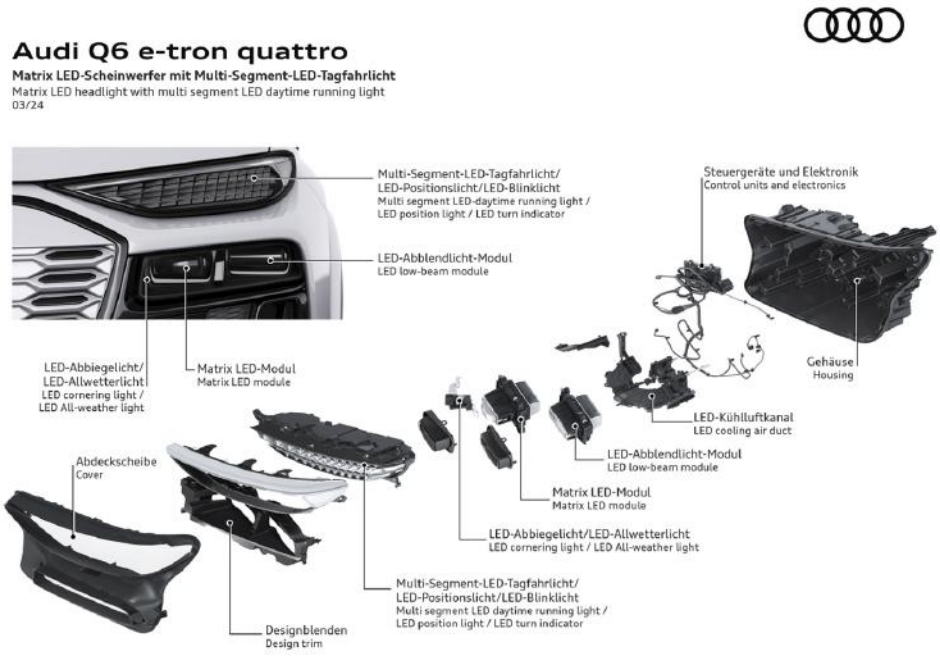
As soon as I arrived at Munich airport, I got a big reminder of the purpose of the trip:

As usual when we talk about lighting, first came a car test to see the lighting performance—the dynamic behaviour of the ADB, especially, since Audi is the pioneer automaker for ADB.

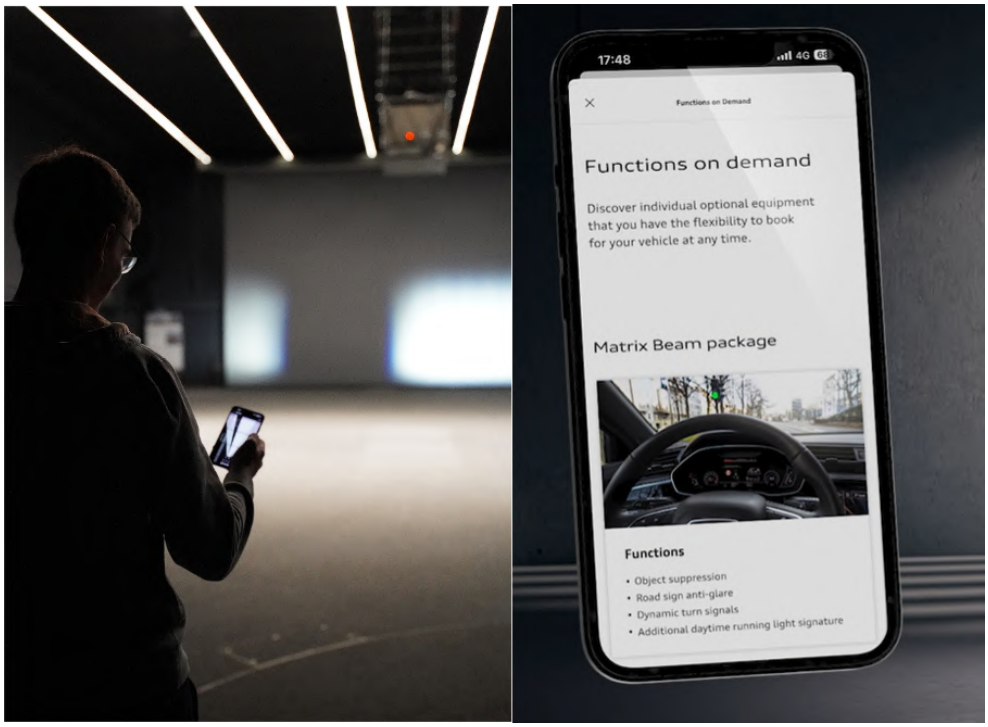
The car had an ADB system with 12 segments per headlamp, with very wide horizontal field—illumination out to 37 degrees outboard. When I drove, I did not see a square box in front of my eyes; the high beam filled my complete field of view. Even with quite large resolution, the system is very smooth, and I felt safe while driving by night. Reaction time is good for oncoming and leading vehicles, even in small typical Bavarian curvy roads.

A single slim low-beam module with 2.5-cm lens height puts 930 lumens on the road. It is augmented by a cornering module to provide for different AFS scenarios: town light with wider beam, all-weather light, cornering function.

High beam is done by the matrix module and a high beam spot integrated in the low beam module; together they put 1,500 lumens on the road.



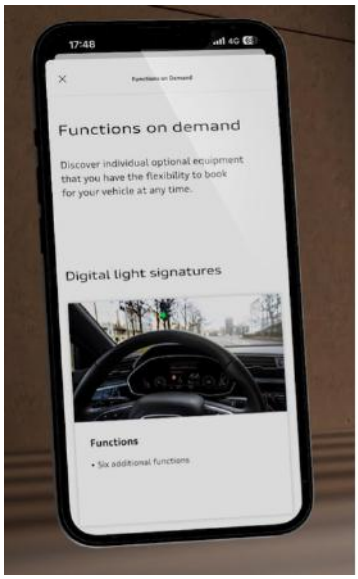
Audi's lighting team has developed a phone app to allow, under certain conditions (garage, showroom, etc) to test and demonstrate the ADB system. On the phone you can deactivate whichever matrix segment you want, and the vehicle reacts accordingly by switching on or off the correct segment. Magic!



The matrix function can also be activated from the phone app with a function-on-demand subscription.

The daytime running and front position lamps comprise 61 independent segments on each lamp, able to provide eight different digital light signatures. This is already possible on other Audi vehicles—the A8 rear lamps, Q4 front lamps, and now front and rear on the new Q6 e-tron.

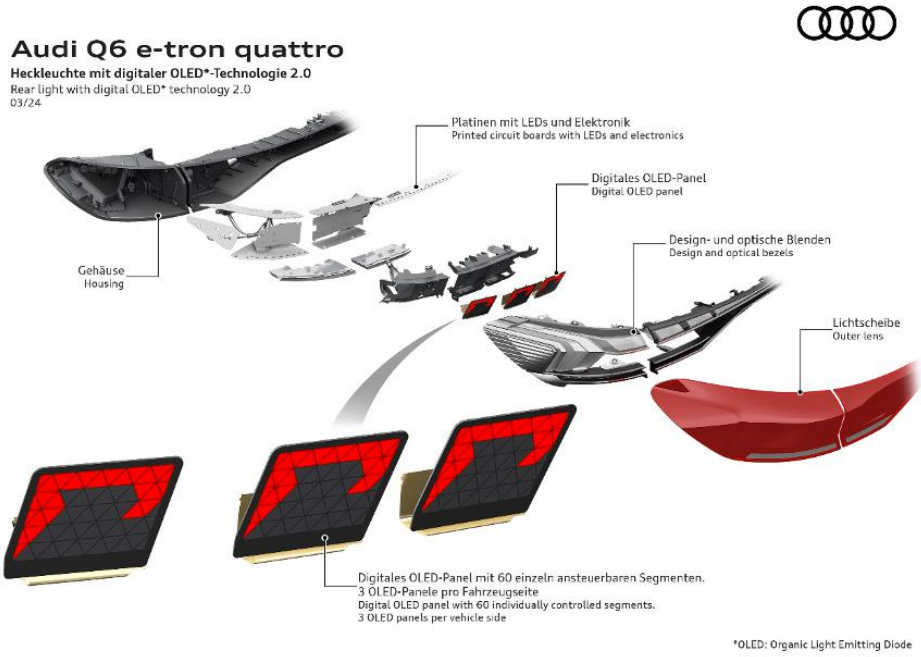
With the phone app and function-on-demand, six additional signatures may be added, including six different coming/leaving home scenarios.



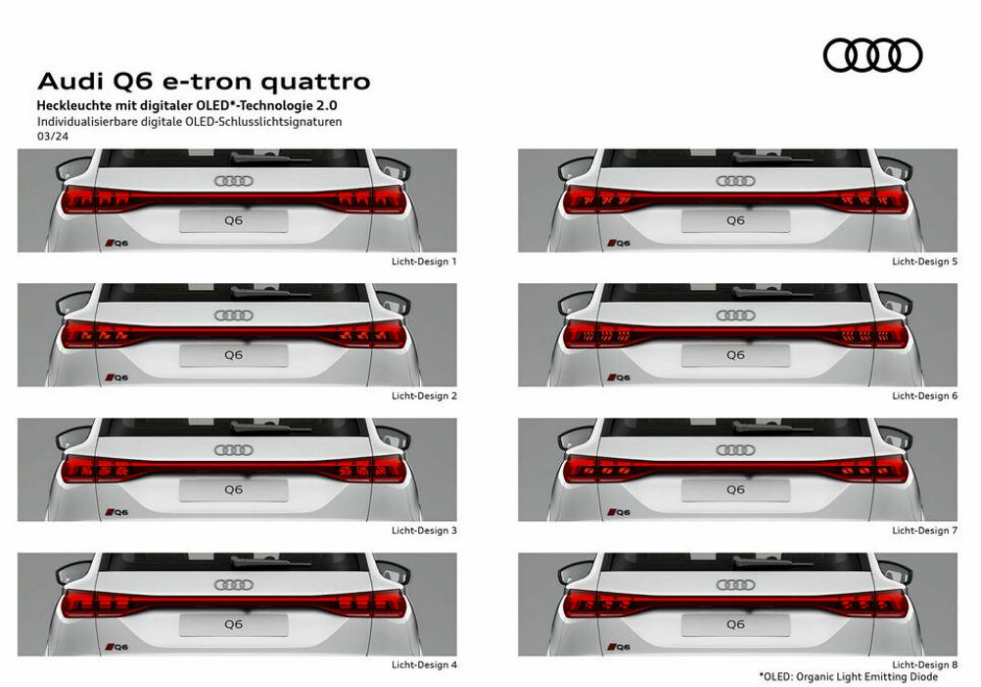
What is totally new on the car is that signature and movement come together for the first time on a car. Audi call it their Active Digital Light Signature. If you look carefully at the front lights, you can identify that the luminance of some pixels (12 among the 61) varies while driving, producing always a constant light intensity to fulfil the legal requirement.

This active signature is more visible on the rear, where the signature is produced by 360 independent segments in 6 OLED panels of 60 segments each. Audi call this Digital OLED 2.0—the previous 1.0 version had just six segments per panel.

Digital OLED 2.0 is designed to emit a deep red colour and a luminance around 2,000 nits. Thanks to OLED technology, Audi can display a variety of signatures in a very flat lamp design.



Similar to the front lamps, eight different signatures are proposed—one of them has the Active Digital Light Signature.



The Q6 e-tron has four innovative functions including different lamp activation scenarios:

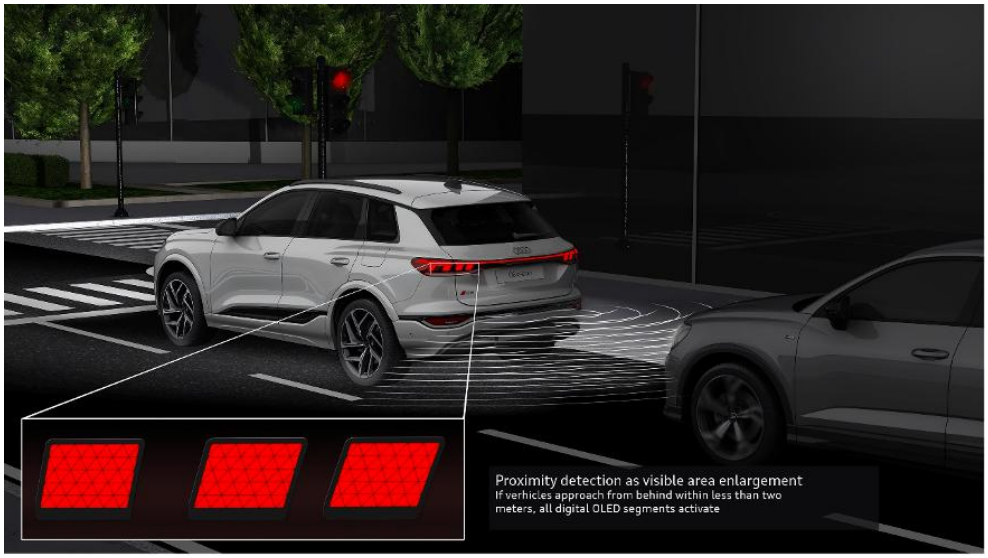
- **Automated parking mode indicator**

*OLED: Organic light emitting diode

When the car is in automatic parking mode, the DRL and rear position lamp shapes are changed to mode-specific ones, including a vertical triangle to indicate this automated mode.

- **Proximity Indication**

This function is a carryover from Digital OLED 1.0. It warns drivers approaching from behind if they are getting too close to the Audi. If a following vehicle gets within 2 metres, all digital OLED segments light up to provide a stronger 'stop' signal to the following driver.



- **Road hazard warning**
  This feature warns other road users of accidents and breakdowns ahead. The communication light displays a specific static rear light signature with integrated warning symbols alongside the regular rear light graphics in critical driving or traffic situations.

- **Exit warning indicator**

The idea here is to communicate to other road users that the driver or passenger will exit the vehicle. A typical use case is a cyclist about to overtake the parked vehicle: the rear lamp will generate a specific signature with a warning so the bicyclist knows to leave extra space.

This feature activates the communication light with warning symbols for Emergency Assist, for the RECAS (Rear-End Collision Alert Signal), when the hazard warning lights are flashing, during an emergency call (eCall), during a breakdown call (bCall), and when the emergency stop lights are flashing.

And then there's the range maximiser function: if the driver wants to extend the range of the car and selects this mode, low beam performance will be reduced by 30 per cent—still legal—and the taillight signature will be simplified to reduce power consumption.
All these new functions are possible thanks to the new E3 1.2 electronics architecture, which makes it possible to control this significantly increased number of segments via a dedicated software module on one of the domain computers. LED and OLED activations

are done directly from these domain computers. This architecture facilitates additional flexibility for software updates with OTA capability.

Clearly, Audi's lighting team leveraged the new possibilities offered by this new electrical architecture to offer innovating lighting functions never seen before. This car showcases the next step of lighting hardware and software innovation. Well done, Audi team!

Lighting News

GRE – 90th session - Short Report from GTB President

LIGHTING NEWS

The Working Party on Lighting and Light-Signalling (GRE) held its ninetieth session in Geneva from the 29th of Aprilto the 3rd of May.

Half of this session was dedicated to the discussion of some controversial points in the proposal for the new 07 series of amendments to the UN Regulation No. 10 on EMC, an important issue also applicable to the lighting and light signalling systems, even if in an indirect way. The proposal was finally approved to be presented to the November 2024 session of WP29. If adopted, it is foreseen to enter into force in mid-2025, with a mandatory application from 2029 for new vehicle types.

On the lighting and light signalling devices side, the main result obtained is the approval of an alternative approach ("configuration 2") for the H11 LED replacement light source category, to be introduced in the Consolidated Resolution on the common specification of light source categories (R.E.5). The existing approach for the H11 LED replacement light source category, based on full photometric equivalence, is kept, and it is referred to as "configuration 1". The proposed specifications of "configuration 2" describe a bi-directional emission characteristic, which enables a more efficient beam generation for road illumination devices. In the recent past this was confirmed by numerous headlamp measurements, which are required for national type-approval of a LED replacement light source in Germany and France. The "configuration 2" light source allows the replacement of the original halogen H11 light source with the LED version which is more technological advanced, has a longer life time and provides energy savings. The adopted category concerns the H11 LED replacement light source while GRE recommended that the GRE Task force on Substitutes and Retrofits would consider H7 and H4 as next steps because these halogen light source categories are still widely used on many vehicles in circulation.

Apart from the approval of some proposals, mainly presented by GTB as part of the usual "maintenance" of the UN Regulations No. 48, 148 and 149, and the approval of a number of changes to the UN Regulations No. 74 (Installation of lighting on mopeds) and No. 86 (Installation of lighting on agricultural vehicles), the other points of interest of this session were proposals not yet finalized or results of discussions in other forums, but related to the GRE activity. In detail:

- the presentation from GTB of a first draft proposal on the Signal Road Projection (SRP) aiming to improve the conspicuity of the reversing lamps and of the direction indicator lamps by means of projection on the ground. The comments, particularly from the CPs, indicate a certain interest for these functions but also some concerns for the possible distraction and confusion they could cause, particularly

in case of dense traffic. The direction indicator projections are considered more critical, due to the frequent use of this signalization, while the reversing projections seem to be more acceptable for its limited and specific use. GTB will improve the proposal, based on the comment received, for discussion at the October GRE session.

- the presentation from the French Administration of a proposal to regulate the (optional) installation of the working lamps. The idea was accepted, in general, with interest; however, some perplexities were expressed about the introduction in the UN Regulation No. 48 of photometric requirements, due to the relative complexity of its verification on the vehicle. The proposal will be updated and discussed again at the October GRE session.
- the presentation from FIA (Federation International de l'Automobile) of the results of their 2024 European consumer study on glare in road traffic (GRE-90-20 and GRE-90-40), mainly devoted to the glare caused by the headlamps but also to the disturbance of some particularly bright signalling lamps. The main scope of the study was to verify if and how much the glaring reported by the road users is a physiological glare or just a disturbance. The results were so negative to push FIA to propose the institution of a Task Force to specifically study the glaring phenomenon. Many CPs supported the idea, recommending that the TF remains under the GRE jurisdiction. GTB recalled its glare and visibility forum in conjunction with GRE-80 in 2018 and offered its cooperation as Secretariat of the TF. The discussion will resume at the October GRE session.
- the proposal from the GRE TF AVSR for the adaptation of the UN Regulation No. 48 to autonomous vehicles will be improved and discussed again at the GRE October session to take into account the terminology and the classification of these vehicles, presently under discussion in specific TFs of the GRVA (The GR dealing with the autonomous driving). In addition to this item, the TF presented a draft concept for a separate UN Regulation on ADS marker lamps (presently under study in GTB) to indicate when a vehicle is driving in autonomous mode.

Dongfeng Eπ 008

LIGHTING NEWS

Dongfeng released their Eπ 008 with an underskin laser-engraving surface paint for lighting signature.

According to the brand this is the first hidden starlight grille. It has multiple presentations such as welcoming guests, charging, and giving way to pedestrians.

There's also a 'digital rhythm charging indicator' which the maker describes as "Like the rhythm of a heartbeat, it lights up the light of hope that leads to a distant place".

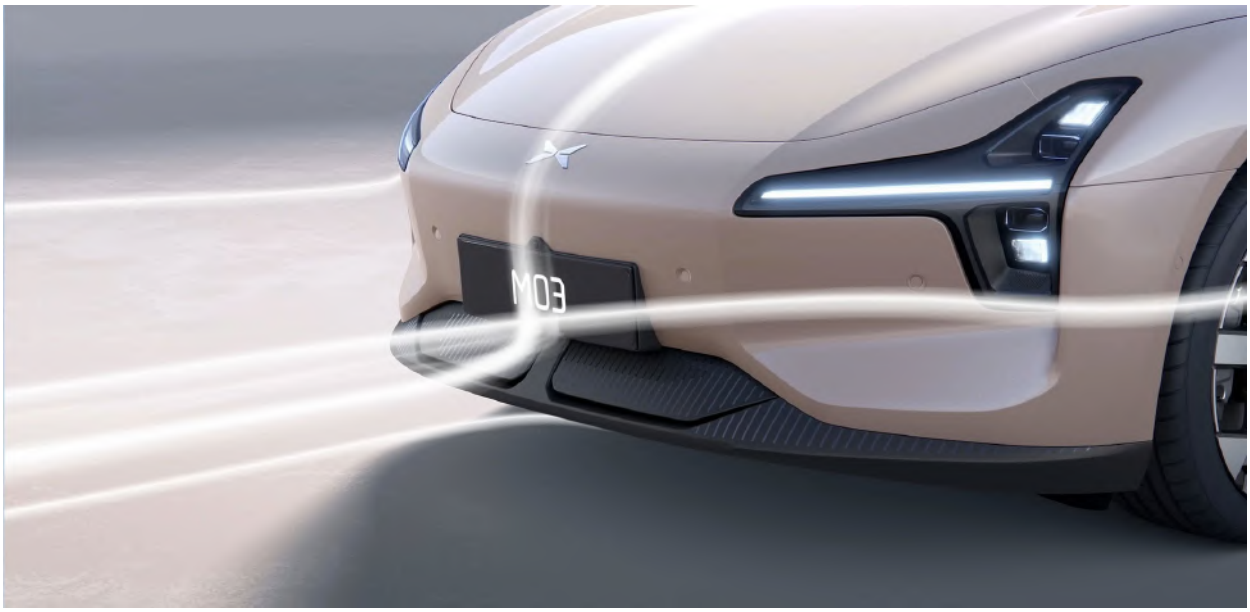
BYD Denza Z9 GT

LIGHTING NEWS

BYD's latest top-of-the-line car is an electric 'super wagon' under the Denza brand, a joint venture with Mercedes-Benz. It has an interestingly eye-catching rear light including OLED and sensor integration in the bumper (for lidar…?).

Xpeng Mona M03

LIGHTING NEWS



Xpeng have released their new Mona 03 and we can see for the first time a new signature for the brand.
The headlamps seem to be closely inspired by a Polestar 4 design. It presents a quite similar signature by day and by night with similar projector units, but in different locations.

What is noticeable on the car is the lowest wind resistance for a mass-produced pure electric sedan: Cd of just 0.194! Xpeng claims their aerodynamic measures increase range by 60 km. This also means 15 per cent less energy consumption per 100 km. The single biggest contributor is an active air intake grille system (AGS), nearly 1 metre long, which alone accounts for 0.023 Cd and a 15.6-km increase in range. Other measures include a wind guide plate at the rear, low wind resistance arc air dam, low wind resistance rims, and a pneumatic streamlined ducktail.

General News

Stellantis 2024 Investor Day Highlights: Powerful Differentiators, Unique Flexibility and Exceptional Returns

GENERAL NEWS

Stellantis had an investor day on June 13th in Auburn Hills, Michigan, US. and the highlights of this investor day are the following:

Just over three years since its formation, Stellantis has successfully established itself as a leading global automaker and, even more importantly, one that through the execution of its **Dare Forward 2030** long-term strategic plan is even better positioned to face the challenges ahead. Today, at Stellantis' first Investor Day, CEO Carlos Tavares outlined nine some strategic differentiators the Company is leveraging to unlock value and address the disruption and reinvention of the auto industry.

. Best Positioned Core:
- Portfolio of 14 iconic and innovative brands covering all price points and multiple regional markets
- Global market presence combining scaled North America and Enlarged Europe regions
- Multi-energy approach

. Profitability advantages: Fully scaled Pro One commercial vehicle business, ability to deliver double-digit margins, sustainable R&D/ Capex efficiency

. Critical Speed and Agility: Re-launch asset -light China strategy with Leapmotor, Rapid development of next-gen portfolio and accretive affiliate businesses

"Today we are a unique company by nature and a powerful carmaker by performance, well-equipped to deliver through tough times and win the long game. Our global presence, powerful technology and brand portfolio span across diverse products – ranging from quadricycles to luxury cars – giving us an enviable customer reach," Stellantis CEO Carlos Tavares told attendees, adding:

"What consumers around the world are looking for is clean, safe and affordable mobility. This is the reason we exist. We are driving a generational shift in technology and a product wave built on multi-energy platforms and flexible operations with above-group profitability in our commercial vehicles business. Together with the activation of our uniquely aligned partnership with Leapmotor, an innovative Chinese new energy vehicle maker, we're confident we can deliver what customers want while providing strong shareholder returns this year, and beyond."

Covestro AG enters into concrete negotiations with Adnoc regarding a potential transaction

GENERAL NEWS

Based on the open-ended talks held so far with Abu Dhabi National Oil Company („Adnoc“) the Board of Management of Covestro AG ("Covestro") after consultation with the Supervisory Board has decided to enter into concrete negotiations with Adnoc regarding a potential transaction and the potential conclusion of an investment agreement as well as to allow for an adequate exchange of company information to confirm assumptions (confirmatory due diligence).

Starting point for the negotiations is a possible offer price of € 62 per Covestro share that Adnoc has indicated to Covestro, which is subject, among other things, to the results of the confirmatory due diligence and agreement on the content of an investment agreement.

”We have made good progress in our discussions with Adnoc. Therefore, we have decided to enter into concrete transaction negotiations with Adnoc”, said Markus Steilemann, CEO of Covestro.

Any potential transaction would, in addition to mutual agreement on the commercial and legal transaction parameters, among other things, be subject to the approval of the respective boards of the parties and clearance by the competent authorities.