Tue, 2 July 2024
Weekly Newsletter

DVN Lighting

NEWSLETTER #862

Editorial

Personal Impressions: The Chinese Lighting Market

I spent 10 days in Chine with part of the DVN team, to visit DVN members and take in some Chinese exhibitions.

I signed a partnership last year with Enmore, to co-host their lidar event, part of the EAC (Enmore Automotive Conference) in Suzhou. The EAC lidar event is the biggest one in China (and worldwide). More than 200 exhibitors, more than 1,000 visitors, and two parallel conference rooms for lectures and panel discussions.

EAC was at the Suzhou conference Centre, A 40,000-m2 venue with over 30 conference rooms. Suzhou is a city of about 10 million inhabitants, about 100 km from Shanghai.

The next week, we went to ALE, the Automotive Lighting Exhibition, at Huaqiao International Centre in Kunshan—50 km from Shanghai. That's another 40,000-m2 venue, and there were again 200 exhibitors and 60,000 visitors during three days.

Here are my top five takeaways:

- **Size:** you cannot really imagine if you are not there. It is quite impossible to visit the complete event even in three days. No quiet room, no time to sleep between conferences, networking, and booth visits.
- **High level of technical content** with focus on new technology, speed to enter into the market, and cost.
- **Local event for local market**: people who attended, spoke, and exhibited were almost all Chinese; if you are not a Chinese native speaker, you can feel a bit lost. Almost all the lamps on display were for Chinese cars, and it was a real surprise for me not to see some of the biggest suppliers like Koito, Valeo, SL, Mobis, Magna, Stanley, Varroc, OP Mobility, and Marelli. Only Forvia Hella and ZKW were there from Europe. There was a large place for Chinese tier-1s: Hasco, Xingyu, Mind, Anrui Wipac, Liaowang, Utas Nova, Jiali, Depo, Yishan, Luye, and more.
- **Vertical integration**: most lighting tier-1s produce tools in-house. A lot of LED makers are also selling semiconductors or even lamps (Sanan and Anrui, APT and Linway, HongliZinhui with Yoshan, etc). Tier-1s may also be owned by automakers, like BYD or Great Wall.
- **Consolidation** may happen sooner or later. There are around 50 Chinese automakers. For vehicle lighting, market value is above €10bn. Only Hasco and Xingyu have revenue above €1bn in China. Most lamp suppliers have a revenue between €100m and €800m, with a lot of players around €200m to €300m.

Sincerely yours,

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

In Depth Lighting Technology

My Main Takeaways from China

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

I tried to summarize in a concise one pager what I have seen in China in 5 main takeaways. It was impossible for me to be exhaustive, because I was not able to visit all the booths and talk with all the relevant lighting exhibitors.

Some Sourcing examples from what I saw during the ALE exhibition (public information):

European lamp suppliers are delivering premium technology in China. For example:

- Geely E8 headlamp, Polestar 4 headlamp, Lynk and Co Z10 rear lamp, Jidu 01 rear lamp are provided by Forvia Hella.
- Polestar 3 and Kia EV3 headlamps are provided by ZKW.

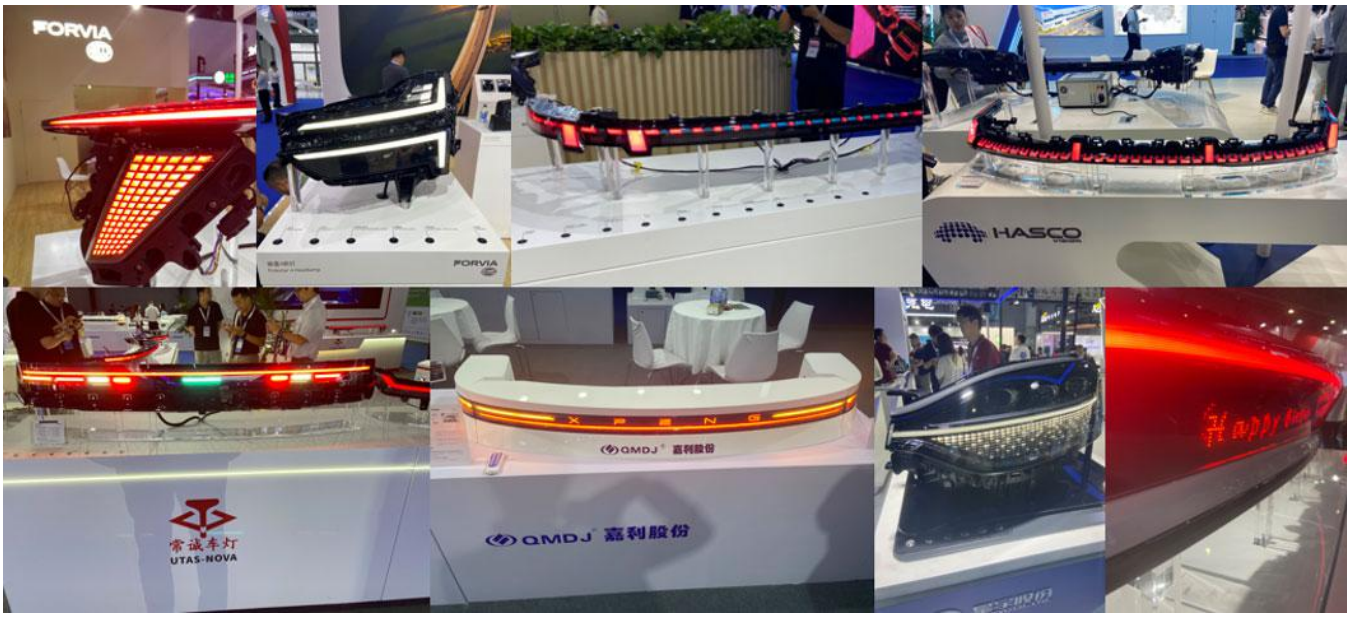
Chinese suppliers are supplying non-Chinese OEMs in China:

- BMW MINI rear lamp is provided by Mind
- Mazda EZ-6 rear lamp is provided by Liaowang
- BMW X5 rear lamp and Volvo EM90 are provided by Xingyu
- Honda e:NP2 is provided by Jiali

Chinese suppliers are supplying Chinese OEMs:

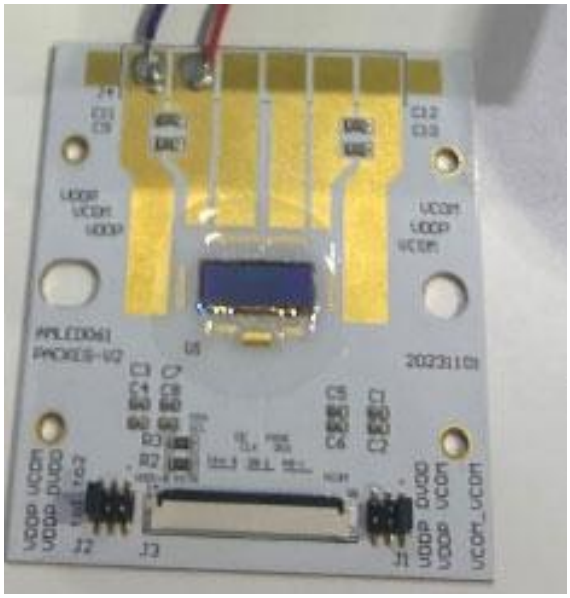
- Anrui supplies Smart rear lamps, Aito M5 headlamps and rear lamps, Jidu 07 rear lamps, and Changan CD701 headlamps.

- Uvas Nova supplies Li Mega front and rear lamps, Nio ES7 rear lamps, Li L9 rear lamps.
- Yishan supplies the Galaxy E5 bumper lamps.
- Liaowang makes the Avatr 12 hood lamp.
- Hasco makes front and rear lights for the Lynk and Co 08; the Zeekr X rear lamps, the Xiaomi SU7 front and rear lamps, IM L6 rearlamp
- Xingyu makes the Aito M9 front and rear lamps, Exeed S7 headlamp and ES ISD (186 leds white + 186 leds amber)
- Jiali does the Xpeng X9 rear lamps and Chery Icar 03
- Mind makes IM L6 headlamp (not only Great Wall vehicles)



MicroLED: new pixel counts are coming for ADB and projection systems:

- 40-kilopixel from BOE and Nationstar. 40-microns size, 800 lm.



MiniLED : all LED makers were presenting their roadmaps for monocolour and RGB solutions with different technical solutions (COB or SMD). Display sizes are around 10 - 20 cm × 5 -10 cm with luminance between 2 and 5,000 nits. Pitch varies from 0.3mm to 3mm. Cheaper miniLED display estimate is around C¥1,000.

- Refond 0.9mm RGB on Great wall SAR. Ready for 0.49mm TGB or 0.3 monocolour
- Nationstar pitch 1mm
- Everlight: 23 PPI

- Anrui and APT: 1.5mm pitch
- Seoul Semiconductor: 1mm pitch
- BOE: 0.9mm COB

Seoul Semiconductor : 1mm pitch

Anrui : 1,5mm pitch

Refond: 0,9mm pitch (Great Wall SAR – Mind)

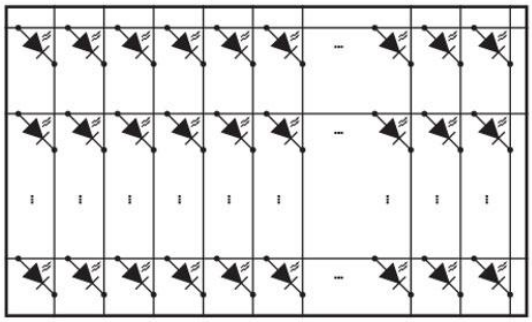
Everlight 23 PPI

BOE 0,9mm pitch

NatioStar : 1mm pitch

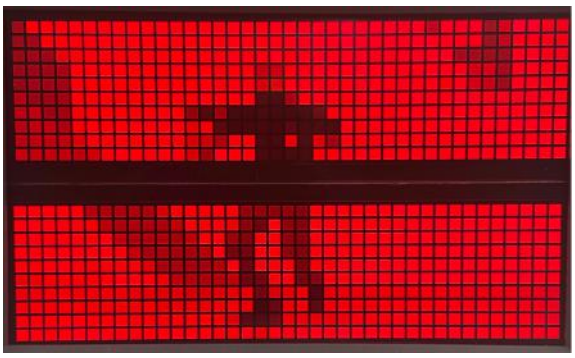
To drive MiniLED displays, two techniques are in competition:

- LED IC solution with SPI or UART over CAN communication like Indiemicro (27 × 6 pixel per led driver), and Lumissil (48 channels) or Macroblock (48 × 32 pixel)



- **• LED IC integrated in LED itself like Brightek solution**

OLED : Yeolight presented their roadmap for pixel size reduction, with 2mm pitch:



First high resolution displays are coming on the market:

- Changhan 701:Headlamp from Anrui with integral RGB miniled display:38,400 LEDs. Five screens. Size 128 mm × 60 mm on each screen. Resolution 1.5mm, luminance 5,000 nits.
- Great wall SAR: rear lamp from Mind which integrates a miniLED display: 11 screens, size 75 mm × 85 mm on each screen. 100 × 80 pixel on each display. Resolution 0.9mm. luminance 2,300 nits.

Lighting News

Recap: GTB 135th Plenary Session

LIGHTING NEWS

From the 3rd to the 7th of June 2024, GTB held its 135th Plenary session in Charlotte, North Carolina, USA with in-person attendance of 70 experts from 12 delegations worldwide.

In addition to the Plenary session, the Technical Steering Committee, the General Assembly and several WGs also met in person.

During the week an Adaptive Driving Beam (ADB) night drive took place at the Charlotte Motor Speedway on Wednesday, 5 June 2024, from 6:00 pm to 11:00 pm, with the purpose to hold a demonstration of ADB testing according to FMVSS 108 (straightaway test only). The demonstration included driving sessions with three different vehicles equipped with ADB (none of them were certified to FMVSS 108 ADB).

The programme for the week was as follows:

Monday, 3 June	09:00 – 12:30	General Assembly (*only GA Representatives*)
	14:00 – 17:30	Technical Steering Committee (*only for WGs officers*)
Tuesday, 4 June	09:00 – 17:00	CE Plenary session (Part #1)
Wednesday, 5 June	09:00 – 12:30	WG Signal Lighting
	14:00 – 17:30	WG Front Lighting
Thursday, 6 June	09:00 – 12:30	WG Installation
	14:00 – 15.00	WG Safety and Visual Performance
	15:00 – 17.30	WG Light Sources
Friday, 7 June	09:00 – 12:30	CE Plenary session (Part #2)

Main results of the GTB Plenary session

- Driver Assistance Projections: a new proposal for predicted trajectory will be sent to GRE-91 as an informal document to amend UN Regulation № 48. As a first step, the predicted trajectory will not be proposed to extend beyond the width of the vehicle.
- Signal Road Projections: two separate formal proposals (one for DI and one for Reversing projections), addressing both R48 and R148, will be submitted to GRE-91. These new independent light-signalling function is intended to provide enhanced recognition of the existing functions to other road users by illumination of the ground surface and prevent traffic accidents.
- Special warning lamps: a formal proposal to amend UN Regulation № 65 will be submitted to GRE-91. The document will collect several minor amendments agreed in the last years regarding: disabling non-approved flash patterns, marking size alignment, correction of wrong references, possibility for categories HT and X to emit light of different colours.
- ADS Marker Lamp despite the general uncertainty at WP.29 level on the next steps, GTB took the initiative to draft a new independent UN Regulation for ADS Marker Lamps. It will be a “Hybrid Regulation” containing device requirements and installation guidelines. The work will be coordinated with the GRE Taskforce on “Autonomous Vehicle Signalling Requirements” (AVSR).
- New GTB-TF on glare control: following the FIA presentation at the GRE-90 and in view of the ongoing concerns expressed by CPs and by the consumers, GTB decided to set up a new dedicated taskforce. This group will aim to have an honest debate on all factors affecting glare, based on scientific evidence and without misconceptions, with the objective to understand what can be done that falls within the powers of the regulators (and what is beyond their responsibility) and provide input to GRE accordingly. The first task will be a literature study of all the available material.
- Failure detection and signalization requirements: a formal proposal to amend both R48 and R149, will be submitted to GRE-91. This proposal is necessary to reflect the technological progress in multiple light sources.
- Regulation 128 category LW7 LED light source: a formal proposal to amend the Consolidated Resolution on the common specification of light source categories (R.E.5) to introduce the categories LW7A/B LED light sources will be submitted to GRE-91. This proposal is necessary in view of the ongoing trends towards style driven DRL lamps and high-performance reversing lamps, which require light sources with higher luminous output to compensate the lower efficiency of the corresponding optical designs.

Future GTB Sessions

23-27 September 2024: GTB Intermediate WG Meeting session – WebEx
18-22 November 2024: GTB 136th session – Salzburg (Austria)
February 2025: GTB Intermediate WG Meeting session – Turin (IT), date to be finalised
Spring 2025: GTB 137th session – Spain, date and venue to be finalised

For further information, see the GTB Website at www.gtb-lighting.org

High Lighting, Tech Content in 2025 BMW X3

LIGHTING NEWS

The newest X3 has just been released, and BMW are putting a great deal of promotional weight on its lighting—including the grille.

The upright front end bears a new rendition of the brand-identifying BMW kidney grille—largely blocked off, except for the active cooling air flaps at the bottom—with vertical and diagonal bars and discreetly-inbuilt camera and radar sensors. Optional Iconic Glow contour lighting forms a continuous line around each half of the grille; this, together with dynamic light carpet, highlights the new design to particular effect. The grille's split continues down to the wide air intake below.

There's also a fresh take on BMW-signature twin headlamps. Overlapping hockey-stick elements provide the daytime running and position light functions as well as the turn signals. Low and high beam are provided by a single LED projector nestled in the crook of the inner signal element. The technically sophisticated look of the new headlight units is also clearly apparent when looking at them from the side. Adaptive LED matrix beams are available as an option, together with urban light and cornering light functions, plus blue design detailing and M Shadow line lights with dark inlays—these upgrades come standard on the M50 xDrive trim.

Distinctive new rear light units present a new version of the characteristic layout for BMW X models. The elements are arranged in a T-shape, with a satinated horizontal turn signal bar and 3D-sculpted cover lenses.

New Porsche 911 Has New Lights

LIGHTING NEWS

Porsche's new GTS is the first 911 with a hybrid powertrain: a new turbocharged 3.6-liter flat-6 engine plus an electric motor and lightweight battery pack. Along with the new powertrain technology comes microLED lighting technology already available on the Macan, Cayenne, and Taycan.

All front lighting functions are integral to the iconic round headlamps, including a bold new rendition of the brandmark four-element signature lights, active in all light modes. This way, no additional lamps are needed, anywhere on the front. This is a cleaner design, and facilitates a large air intake for cooling the powertrain. Up close, the signature lights look like eyebrows over the headlamp-lens eyes, giving a look of intense concentration.

The headlamps have 11-segment matrix LED technology as standard equipment. There's an optional HD-matrix upgrade with over 32 kilopixels per headlamp; this system generates a high-resolution, digital light image that covers the entire high beam range as well as the main area of the low beam. Each individual pixel can be activated, deactivated or dimmed in 1,024 steps. This creates a light field that adapts dynamically to the driving situation at lightning speed. The HD lamps also offer great versatility by dint of lane illumination, roadworks and narrow-lane lighting, spot marking light, a dedicated motorway high beam, as well as special lighting modes for driving in rain or fog, at junctions, when turning, and in bends.

The HD system uses modules with 16,384 individual microLED pixels on a surface measuring just under 41 mm^2. Each lamp contains a module with a wide-angle lens for wide light distribution (40°W × 10°H), and one with a telephoto lens for long range (20°W × 5°H). A powerful control unit monitors the dimming, activation and deactivation of the individual pixels. The system calculates changes in just 16 milliseconds.

The HD modules are located in the lower section of the headlights. The bifunctional modules installed above them provide the courtesy lighting and the auxiliary high beam. If the system does not detect a vehicle in front or an oncoming vehicle when the automatic high beam is activated, the auxiliary high beam switches on and increases the amount of light from 1,400 to 2,500 lumens. The auxiliary high beam illuminates the road to a distance of more than 600 metres. If another vehicle is detected, the system automatically switches back to HD matrix mode.

Valeo Plant Birthdays: Martos @ 53 and Chrzanów at 20!

LIGHTING NEWS

For 53 years, Valeo Martos (Spain) has been designing and producing lighting technology for the most demanding Customers in Europe. The site—with 2,700 people including 500 engineers—produces headlamps, rear lamps, electronics, and interior lighting products, and develops projects to be manufactured across Valeo's European lighting plants. Expertise and capabilities on site include optics, electronics, mechanics, simulations, prototypes, automation, tooling, maintenance, and more.

Eight million headlamps and rear lamps and 11 million electronic parts are produced every year on the site, which runs over 70 production lines and almost 500 robots. 25 development projects are currently in progress, and a new building dedicated to R&D will be inaugurated after summer 2024.

Meanwhile, for 20 years now, Valeo's Chrzanów (Poland) site has continually grown in size and capabilities. Last year, the plant produced 6.5 million lighting units for carmakers worldwide. The site employs 2,200 people, including an R&D team of 60 engineers focused on developing state-of-the-art rear lamps.

Driver Assistance News

Verne: Rimac's New L4 EV Marque

DRIVER ASSISTANCE NEWS

Rimac have launched a new L^4 autonomous EV brand—Verne—and the first model is slated to go on the market in 2026.

Rimac have been working on autonomous technology since 2017, and in 2021 they received €200m from the EU to develop robotaxis as part of a €6.3bn recovery plan for Croatia (the incentive package opened the company up to a lot of criticism, including one member of the Croatian parliament calling founder Mate Rimac a fraud and "the Balkan Elizabeth Holmes"). The company also have received funding from Hyundai and Kia.

The robotaxi will be fully electric, with autonomous technology from Israel-based Mobileye. Verne will use Mobileye Drive, a self-driving system that uses the Israeli company's EyeQ system-on-a-chip, as well as a data crowdsourcing program called the Road Experience Management, or REM, which uses real-time data from Mobileye-equipped vehicles to build out a global 3D map.

The vehicle is L^4 fully autonomous, meaning it lacks traditional controls like a steering wheel and pedals as well as like windshield wipers and side-view mirrors, in the interest of reducing drag and enhancing the aerodynamic experience.

The vehicle has six lidars, one long-range and five short. On the front, just below low- and high-beam elements can be seen the short range lidar, one left and one right.

General News

Avatr Picks Up RedDot '24 Awards

GENERAL NEWS

Avatr's 11 and 12 models have won RedDot design awards. The jury were impressed with both models; here are the jury statements:

"A holistic user experience was at the forefront of the development of the Avatr 11. The clear external design is in harmony with the warm, inviting interior design. The futuristic exterior is complemented by hidden sensors and lidar systems, to enable advanced assisted driving. An adaptive spoiler enhances the aerodynamics. Inside, technology and design are in balance, with a 14-speaker sound system and acoustic glass creating a pleasant atmosphere. The Avatr 11 seamlessly integrates extensive technical equipment with flowing lines on the outside and a lounge atmosphere on the inside".

"The exterior design of the Avatr 12 combines monolithic, emotionalising elements with a sporty, powerful aesthetic. The front achieves a futuristic expression with e-shaped lights and a halo display on the bonnet. 'Gravity Lines' and seamless surface integration shape an elegantly flowing side view. The interior has a lounge character; the cockpit is user-friendly with an innovative steering wheel and a wide-screen central touch display. The Avatr 12's distinctive design elements, such as the omission of the rear window, make it an eye-catcher that exudes dynamism and confidence".

A video is posted on LinkedIn.

Horse powertrain Aramco investment

GENERAL NEWS

Aramco, one of the world's leading integrated energy and chemicals companies, through a wholly owned subsidiary has signed definitive agreements to acquire a 10% equity interest in Horse Powertrain, a new global powertrain solutions company, alongside Renault Group, Zhejiang Geely Holding, and Geely Automobile Holdings. Horse was formed on the last day of this past May by Renault Group and Geely, and is incorporated and headquartered in London, England.

Aramco will acquire a 10-per-cent equity interest in Horse in equal parts from Renault Group and Geely, which will each retain 45-per-cent equity stakes. The price to be paid by Aramco —subject to customary closing conditions including the receipt of regulatory approvals—will be based on a €7.4bn enterprise valuation.

This investment aims to enhance Aramco's contribution to the global energy transition through the development and commercialization of more efficient mobility solutions. The agreements also include collaboration arrangements for Aramco and Valvoline on technologies, fuels, and lubricants to collectively improve the performance of Horse's engines.

Aramco, Renault Group, and Geely share the view that the automotive industry will require a combination of technologies, including highly efficient engines, transmissions, and hybrid powertrains; alternative fuels such as lower-carbon synthetic fuels and lower-carbon hydrogen, as well as EVs, to support an orderly energy and mobility transition around the world.

Horse's mission is to 'lead the race towards lower-emission next generation technologies, and Aramco's unique capabilities, including a global network of R&D centers where research on synthetic fuels, hydrogen, and ICE optimization is conducted, can help facilitate the development of more sustainable and accessible lower-carbon solutions'.

Horse CEO Matias Giannini says, "I am delighted that Aramco has joined Horse Powertrain Limited. Their expertise in fuels and hydrogen makes them a great partner for us to deliver cutting-edge, lower-emission powertrain solutions, driving our industry's carbon mitigation efforts forward. Together, we will set new benchmarks for innovation in the automotive sector".

Horse have around 19,000 employees; five R&D centres, and 17 plants round the world; nine industrial customers in 130 companies (including vehicle makers). They work with all types of powertrains—full hybrids and long-range plug-in hybrids as well as internal combustion engines that use alternative fuels such as ethanol, methanol, LPG, CNG, and hydrogen.

VW to Put $5bn Into Rivian

GENERAL NEWS

Volkswagen Group will invest up to USD $5bn in U.S. EV maker Rivian as part of a new, equally-controlled joint venture to share EV architecture and software.

The investment will provide Rivian funding necessary to develop their less expensive, smaller R2 SUVs set to roll out in early 2026, and their planned R3 crossovers, CEO RJ Scaringe told Reuters. The partnership will enable Rivian to cut operating costs by leveraging volumes of supplies including chips and components, he added.

It will also help Rivian turn their cashflow positive. The company will licence their existing intellectual property to the JV, and the R2 will be the first vehicle using software from the JV. Volkswagen vehicle brands will follow, including Audi, Porsche, Lamborghini, and Bentley.

Volkswagen will immediately invest $1bn in Rivian through a note that will convert to stock on 1 December, subject to regulatory approvals. VW will also make a billion-dollar payment at the inception of the JV, expected in the fourth quarter of this year, and will invest $2bn in Rivian stock—one billion in 2025 and one in 2026—subject to the startup hitting certain milestones, and provide a billion-dollar loan in 2026.

New Renault Grand Koleos

GENERAL NEWS

Renault unveiled their new Grand Koleos hybrid SUV at the Busan Motor Show in Korea. It shares nothing with the previous Koleos, as it is heavily based on the Geely Xingyue L, which debuted in 2021. It is the first product of the partnership between Geely and Renault.

The front bears the characteristic Renault grille and bumper intakes, with new LED graphics on the headlamps. The sheetmetal is new, and the greenhouse has been slightly revised towards the back. The rear end is carried over with small changes on the bumper and tailgate.

Like the Geely model, the Renault Grand Koleos rides on the CMA architecture, also used by the Volvo XC40 and several models from Geely and Lynk & Co. There are options for both ICE and hybrid powertrains, and the platform is also compatible with EV configurations.

The electric setup comprises a turbocharged 1.5-litre engine and dual electric motors, producing a combined 242 hp (180 kW / 245 PS). There is also a turbocharged 2.0-litre gasoline engine, delivering 208 hp (155 kW / 211 PS). In both cases, power is transmitted to the front axle, with the ICE model also offering the option of all-wheel drive.

The Grand Koleos will be available in Korea starting this fall, with the company already accepting applications of interest. Currently, it is unclear if Renault plan to export the model to other markets.

Hyundai Inster is New A-Segment EV

GENERAL NEWS

Hyundai's electric Inster is a new A-segment subcompact EV, launched at the 2024 Busan International Mobility Show.

They provide a wide-eyed signature, and there are pixel-graphic turn signals, tail lamps, and projector headlamps.

For an A-segment vehicle costing around €20,000, the lighting content is impressive: LED low- and high-beam projectors, round-ring LED daytime running lights, pixel-graphic turn signals and taillights, and rear position lamps on the tail gate (with auxiliary lamps in the bumper).

Valeo are Frost & Sullivan Company of Year

GENERAL NEWS

Software is now a key component of modern mobility, and car manufacturers are moving from hardware- to software-based architecture: the software-defined vehicle (SDV).
Valeo Group are a key innovation partner of global automakers for their SDV, as the Group offer the largest portfolio of sensors, high performance computing units along with their cooling systems, as well as one of the largest software offerings in the market, including embedded software, software as a product and software services (integration, validation, testing). Valeo have more than 30 years of experience in providing software solutions for safer, cleaner, affordable mobility. Today, more than 40 per cent of Valeo's 20,000 (and counting) engineers are dedicated to software, systems and artificial intelligence.

Marc Vrecko, CEO of Valeo's Brain Division, said, "We are honoured to receive the 2024 Global Company of the Year Award from Frost & Sullivan. This recognition highlights our leadership in the Software-Defined Vehicle revolution, combining cutting-edge software with advanced computing platforms".

Each year, Frost & Sullivan present a Company of the Year Award to an organisation for demonstrating excellence in growth strategy and implementation. The award recognizes a high degree of innovation in products and technologies, and the resulting leadership in terms of customer value and market penetration.

Kamalesh Mohanarangam, Frost & Sullivan's Associate Director and Head of Connected and Autonomous Vehicles Research, said, "Valeo showcases pioneering efforts in addressing customers' unmet needs within the automotive industry with the launch of Valeo anSWer, a revolutionary transformation journey poised to redefine the future of mobility. Building upon decades of expertise and innovation, the company recognized the pressing need for a comprehensive, integrated software platform that seamlessly integrates diverse automotive functionalities."
And Rabin Dhakal, Frost & Sullivan's Best Practices Research Analyst, added, "Valeo capitalizes on the convergence of energy, big data, and computational intelligence to redefine mobility and create unparalleled opportunities in the automotive landscape. Its impressive growth trajectory over the past three fiscal years and its top-notch collaborations highlight the company's ability to capture market opportunities effectively and deliver exceptional value propositions to customers".