Tue, 6 February 2024
Weekly Newsletter

DVN
Lighting & ADAS

NEWSLETTER #841

Editorial

Pixel Style: Fad? Or Trend?

When LEDs first appeared in exterior car lights—the first application was the CHMSL on the 1986 Chevrolet Corvette—and as they gradually gained traction in the 1990s and 2000s, designers wanted to show the LEDs with "dotty" or "spotty" lamp designs. At first, technical immaturity meant there was little other option, but even once that

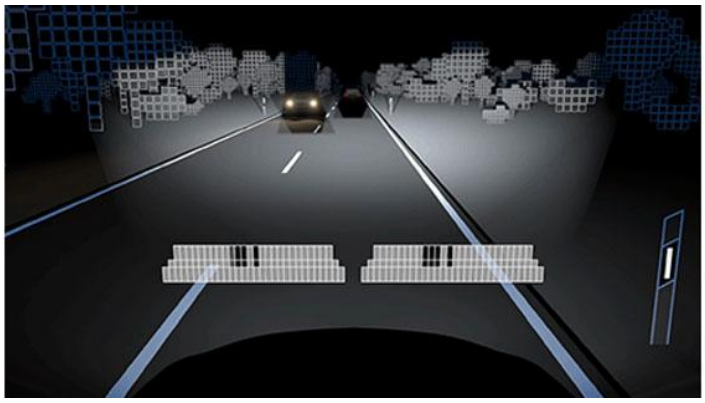
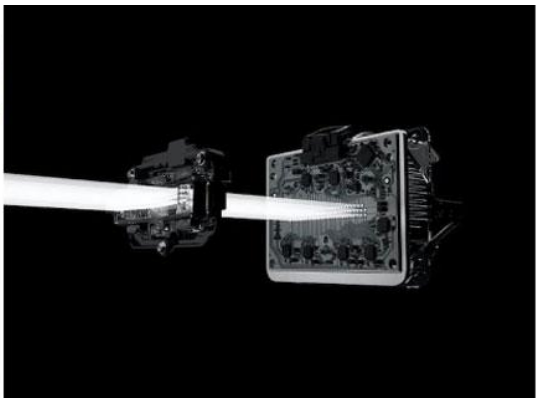
was no longer the case, the idea was to show off the newest lighting technology with dots and spots.

Then came 2010, and designers started wanting to hide the LEDs. Spotty lamps became a stylistic has-been in a decade of homogenous light signatures.

All automakers, suppliers, and simulation and mesurement specialists focussed their R&D efforts on hiding the LEDs. Everybody was talking about luminance maps, viewing angles, luminance specifications, and camera investments to have smooth, even lighting from hidden emitters.

Luminance simulation (Edag), luminance camera (LMK), luminance measurement (ISAL 2013)

Then came a new kind of dots: pixels. When we talked about pixels in 2010, it was for road illumination—ADB.

In 2020, pixel-design lamps appeared. First in concept cars, and now on production vehicles.



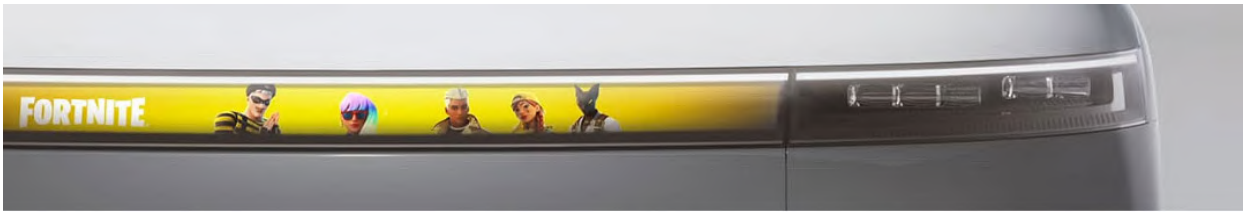

Chinese automakers have barged ahead with **'ISD'** (interactive or intelligent social display) to communicate with other road users in whatever nonstandard way they might dream up, and to make car lighting in to playtoys.


The question now is not who has the biggest engine, or the highest lumen output. The hot questions now are about what's the best pixel pitch, and what luminance is needed for daytime visibility. During 2023's lighting events, we saw a variety of solutions with pitches from 12 to 1 mm.

Avatr 11, 10mm pitch ↑
Avatr 12, 4mm ↓

↑ Xingyu @ DVN Shanghai '23, 1mm pitch
↓ Marelli @ ISAL '23, 12×12 vs 6×8

What will be the next steps? Do we need a pitch smaller than 4 mm? Do we need to go to mini- or microLEDs? OLEDs or TFTs? **Is pixellization a fad, or the new trend?**



These questions will be addressed at the designer panel discussion at the Munich DVN Workshop at the end of this month, with the rubric "**Will the front and rear end become displays?"**. It will surely be interesting to talk and listen with prominent exterior and lighting designers about this trend and to understand the drivers and staying power. See you there!

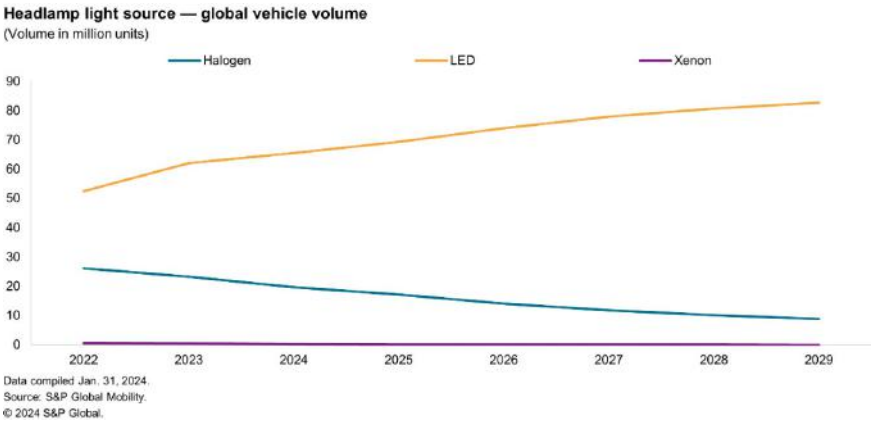
Paul-Henri Matha
DVN Chief Operating Officer and Lighting General Editor

In Depth Lighting Technology

Gamechanger Lighting?

by Sascha Klapper, S&P Global Mobility Research & Analysis Manager

The automotive lighting industry always excites me these days. It has evolved from a simple car lamp provider to a confident and very dynamic industry that is innovative and design driven. It is not just about seeing and being seen better; vehicle lighting is going far beyond. Lighting has become a clear overall brand differentiator with new lighting signatures and advanced lighting functions. New technologies are being incorporated into headlamps, tail lamps, cabin illumination and the overall vehicle. Carbide lamps, as well as halogen or xenon lamps, are things of the past. The LED has become the state-of-the-art light source across all sales segments. And yet, we are already discussing the adoption of mini- and microLED technologies, with lasers making their debut.

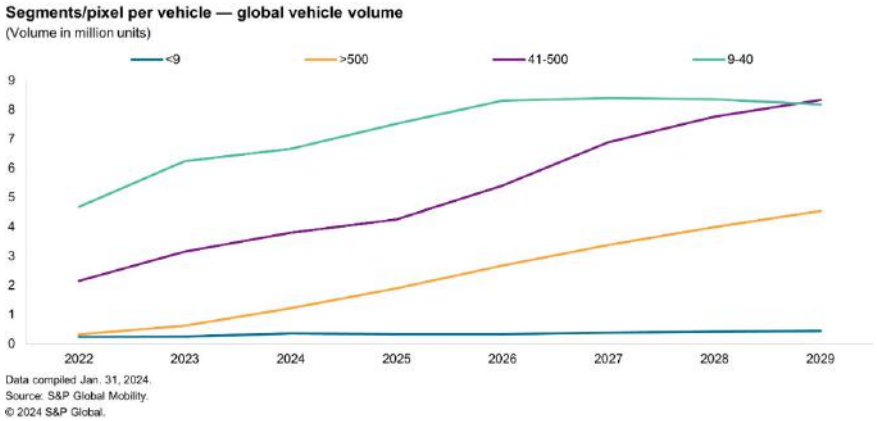


However, it is not only about the light source. Vehicle lighting is increasingly leaving its classic position inside the headlamp or tail lamp. BEVs are a game changer, as the lighting design is different compared to traditional combustion-powered vehicles. Illuminated fronts, surfaces with lighting animations, and illuminated logos are now broadly used. An EV should look like an EV, so automakers are distinguishing the look of their EV models. In addition, with the increasing use of sensors in vehicles, which are typically not aesthetically pleasing, lighting provides an elegant solution to hide

those sensors and enhance the look of the car. This raises the question: is lighting the new chrome as the industry claims?

European and North American automakers are facing increasing competition from Chinese original equipment manufacturers. While these makers do not carry a legacy, they are eager to adopt new technologies and light signatures, as well as the entire supply chain in China. The grilleboard illumination market is projected to grow at a compound annual growth rate 31.7 per cent until 2029, while illuminated front logos will likely grow at a CAGR of 38.8 per cent over the same period. In the coming years, I anticipate a fundamental evolution, potentially even a revolution, in the overall vehicle lighting market, driven by new technological developments and diverse supply chains. There are already some recent merger and acquisition activities and increasing joint ventures among suppliers.

Safety remains a priority in lighting. ADB headlamps are a clear contributor to the overall safety of the vehicle since most road accidents happen at night. In recent years, there has been broad adoption and many new developments of ADB across all sales segments. ADB is expected to continue to grow at a CAGR of 16.5 per cent until 2029, with a global uptake rate of more than 20 per cent in 2029. The major market for ADB headlamps will remain Europe, closely followed by China. There is an underlying trend toward higher ADB segments or pixel content. The ADB growth was mainly driven by entry-level ADBs of 10 to 20 segments per headlamp, while there is a shift toward higher segments or pixel content, which will surpass entry-level ADBs soon.



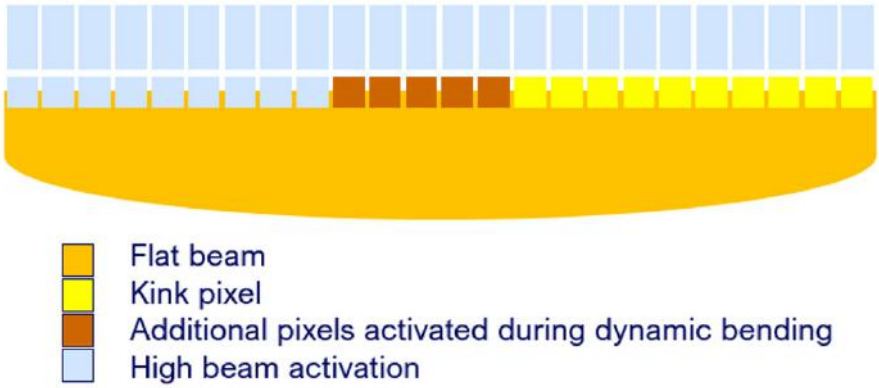
Vehicle lighting is moving beyond the traditional headlamps and rear lights, increasingly focusing on the near-field surrounding of the vehicles. The near-field projection is emerging as the next innovative trend in the lighting industry. This upcoming trend suggests an increase in the use of lighting all around the vehicles. It remains to be seen whether lighting will remain on its evolutionary trajectory or if we will see a new lighting revolution.

Lighting News

'24 Ford Kuga: Lighting Details

LIGHTING NEWS

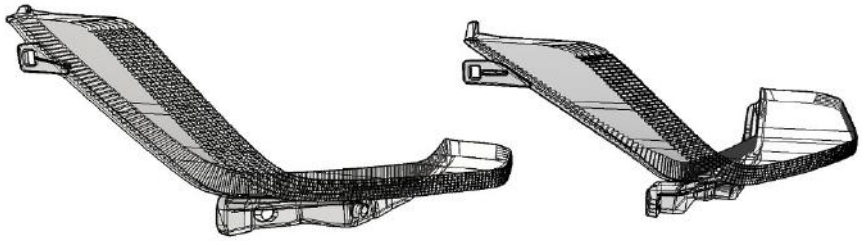
The new Kuga has an eyecatching full-width LED light bar framing the grille, and dynamic pixel LED headlamps are available as an option—they use Valeo's two-row 48-pixel ADB module, with more than 4,500 lumens in the high beam and a virtual dynamic bending light done by illuminating additional pixels of the kink row. The low beam is built up of a flat beam and a kink beam provided by the inner and outer projector module, giving the car an all-lit appearance. The flat beam module creates an extra wide beam in the near zone and is supplemented by an additional static bending light when tight corners and city maneuvers require increased visibility close to the vehicle surroundings.



As the kink beam is produced by the Pixel module, software enables the customer to switch between right- and left-hand traffic, eliminating the need for a specific headlamp assembly for each traffic rule—reducing manufacturing and parts management complexity.

The car has a massive 920-mm full-width light bar fired by just one LED on each side, which optically connects to the headlamps and provides a special visual signature.

Two massive L-shaped light guides with prismatic optical elements create a crystal appearance when the headlamps are switched off. In daylight they provide signature daytime running light styling and complement the upper lightguide and full-width band as position light at night.



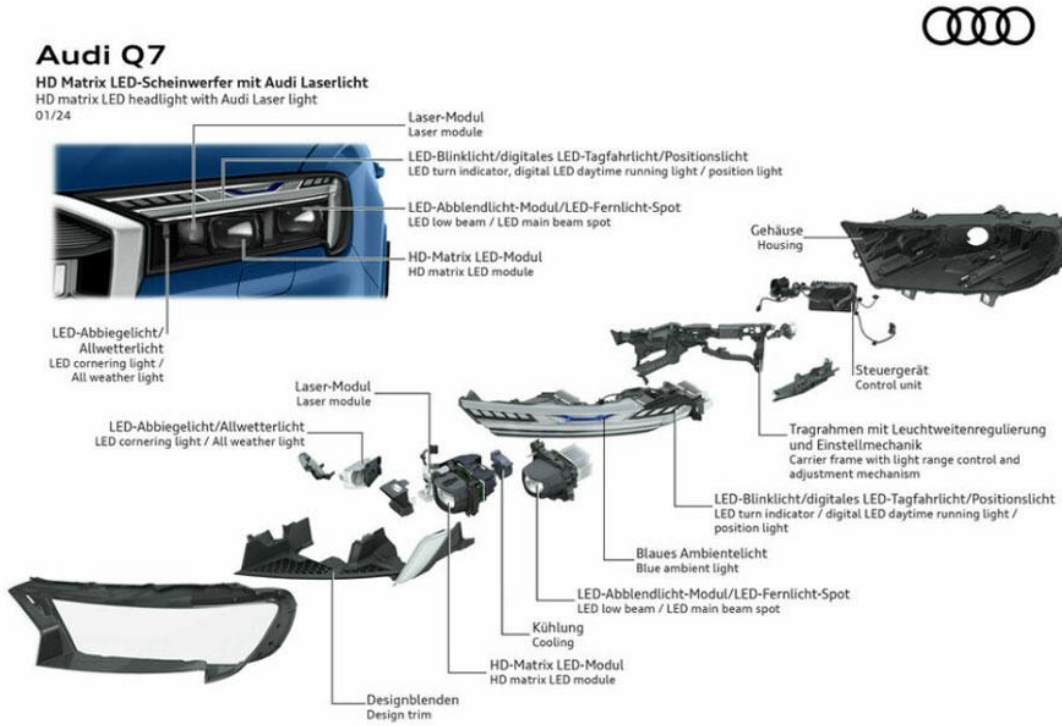
The predictive dynamic bending light in the 2024 Ford Kuga uses a preview of the road ahead to predictively steer the light beam into the next curve. Traditional bending light systems can only focus on the corner at hand by reacting to the driver's input, but this predictive system provides effective guidance through the path ahead, improving visibility and increasing safety when driving through dark and winding roads. The preview system now includes map-based dynamic bending, which uses navigation and map data to complement the existing camera-based technology. High-resolution curvature information is stored alongside the regular map, and is used to generate an 'electronic horizon'. Knowing about the corner ahead even before it enters the visual range of the camera or the driver enables the creation of a seemingly magically smart set of headlamps.

With the navigation system being independent of almost every weather influence, map-based dynamic bending improves the performance and increases the overall availability of the predictive dynamic bending light. At the same time, map updates provided by connected services make sure that the system is kept up to date and gets to use the most current map data.

New Light Tech, Style on Audi Q7

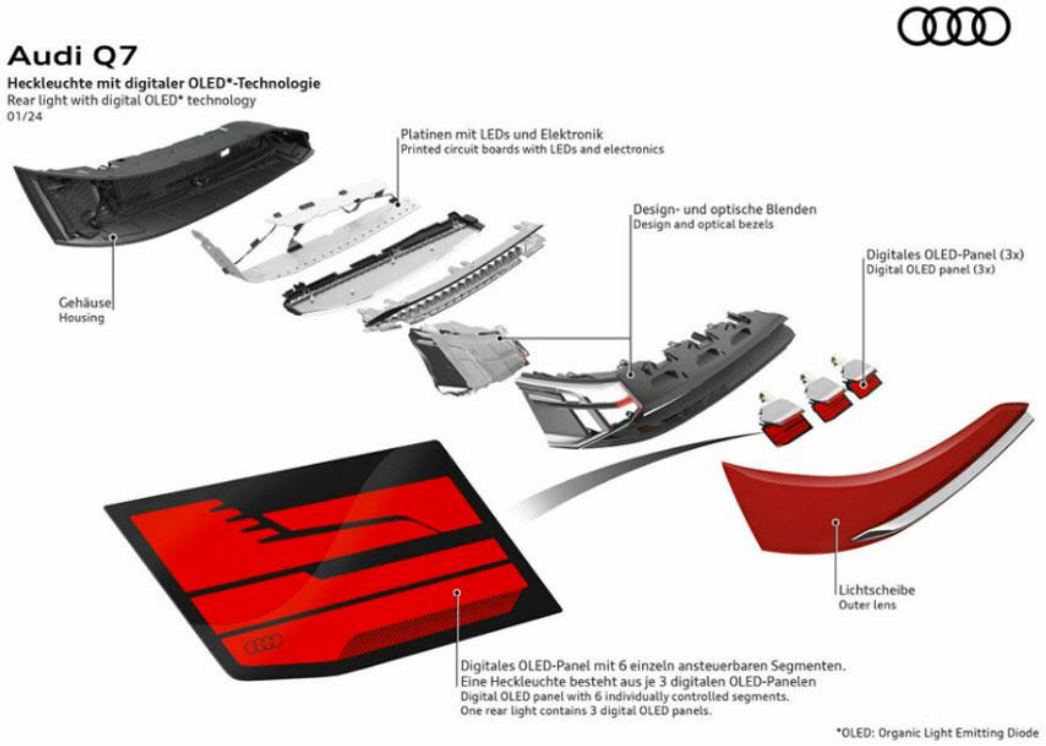
LIGHTING NEWS

Audi's refreshed big Q7 SUV has all kinds of new lights. High-performance LED headlamps are standard equipment, with Matrix LEDs or HD Matrix LEDs + laser high beam booster available as options. They work with 24 LEDs and a high-power laser diode on each side of the car, buyers' neighbours will know to be envious by dint of a blue ambient light incorporated into the top-spec lamps, which symbolizes the laser technology. The laser light becomes active above 70 km/h and significantly increases the high beam seeing distance. New for the top-of-the-line headlamps are digital DRLs, which allow the user to choose from four light signatures. And the DRLs are in a newly raised position.



For the first time, the Q7 also features largely digitalized OLED rear lights as an optional extra, which also feature four user-selectable light signatures. And they have a proximity indication feature in conjunction with the assistance systems: When other road users get within 2 metres of the back of a stationary Q7, the control units automatically activate all of the digital OLED segments to warn them not to hit the car

(especially not to hit those expensive lights!). Additional functions include dynamic turn signals and a variety of welcome/farewell light signatures.



Driver Assistance News

Smart #3 Gets 5-Star NCAP Grade With Valeo Smart Safety 360

DRIVER ASSISTANCE NEWS

Smart's #3 model has just been awarded five stars in the Euro NCAP tests. This latest model is equipped with a Valeo Smart Safety 360 system including sensors, detection systems, advanced functionalities, a smart front camera and radars.

Valeo's Smart Safety 360 (VSS 360) is a new turnkey ADAS that lets automakers offer safety and park assist functions from entry-level models. It is an efficient, affordable way to provide a range of safety and parking assistance functions with limited impact on the architecture of the vehicle, and therefore on the cost.

With its scalable system approach, the system provides L^2 and L^{2+} ADAS functions that meet safety standards such as the latest GSR and NCAP requirements. The smart front camera does a lot of the heavy lifting; depending on automaker specifications, it can be connected to ultrasonic sensors and radars, and used as a central computer. This helps automakers optimize by removing individual ECUs as the different types of safety & ADAS sensors are integrated into the front-camera-based architecture.

Rimac to Launch Robotaxi Service by '26

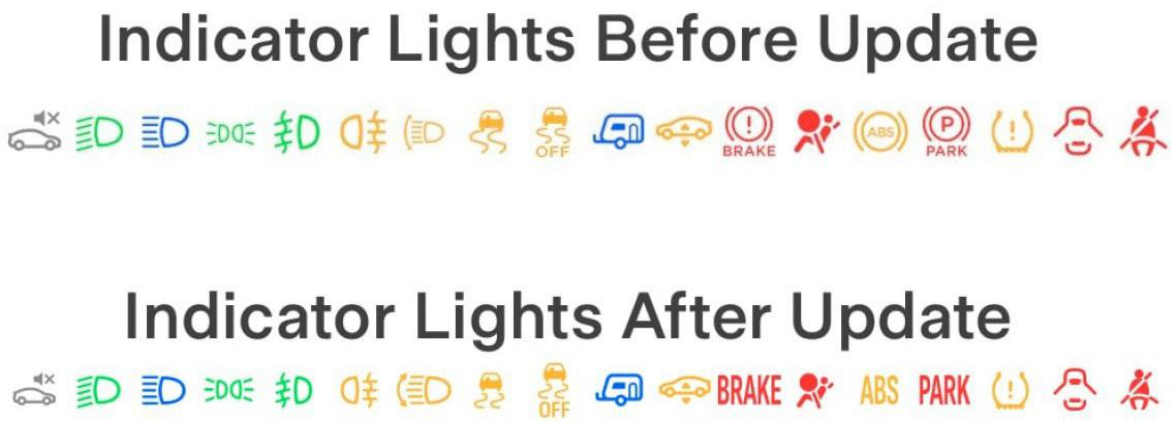
DRIVER ASSISTANCE NEWS

Rimac will show a highly autonomous robotaxi early this year, and they plan for it to be in commercial operation by 2026. The Croatian company, maker of the 1,877-bhp Nevera EV and parent of Bugatti, are expanding into the mass-mobility market under the Project 3 Mobility moniker.

Rimac have revealed only a few details of the commercial plan for their robotaxi yet, but one thing they have said is that some backing will come from Kia. The robotaxi is understood to be capable of driving entirely without human input and will operate within a framework of infrastructure being

Latest Recal Covers Every US-Spec Tesla

DRIVER ASSISTANCE NEWS



Tesla has been forced—again—to recall and fix cars that don't meet applicable safety standards. This time, it's because they failed to make every single one of their US-specification cars in accord with one of the easier-to-meet aspects of the Federal Motor Vehicle Safety Standards.

The noncompliance involves the brake system fault, ABS fault, and parking-brake-applied telltales. In most of the world, symbols are used for these telltales: an uppercase P; an exclamation point, and the letters ABS in the centres of pictograms meant to look like a wheel brake.

But in the U.S., the word BRAKE is required for the brake system fault telltale. If a separate telltale is used to inform the driver that the parking brake is applied, it must use the word PARK. And the one for the antilock brakes must read ANTILOCK, ANTI-LOCK, or ABS. All these must be in letters at least 3.2 mm tall. Symbols are allowed, too, but they're optional; the words must be present, and they must be sized according to the regulation.

As has become customary, Tesla enthusiasts have been quick to dismiss the fix as a non-recall, because the fix involves an over-the-air software update rather than time and hassle taking the car in for hands-on service at a dealer—a quibble at best, but this time it's an actual, real, old-fashioned recall, at least for four model years' worth of cars. No Tesla sold from 2012-2015 can be updated over the air; they must be taken to a repair centre for a software reflash. That's because even though 4G/LTE was in common use in 2012, Tesla chose to use a 3G cellular radio for data service on their 2012-'15 models—AT&T's 3G service, specifically, which was permanently shut down in December 2022, making all those Teslas unreachable.

They do have Wi-Fi, but the recall requires updating even those vehicles not parked near a Wi-Fi hotspot overnight—and that means Tesla must mail out paper notices and make service centre appointments.

General News

Lancia Ypsilon to Launch in Italy in Days

GENERAL NEWS

The new Lancia Ypsilon Edizione Limitata Cassina is quite a mouthful of a name for a car to be launched in Italy on 14 February. Many vehicles have had "Limited" somewhere in their trim line names, but Lancia really mean it: 1,906 numbered and certified units will be made. The collaboration between Lancia and Cassina introduces a design language they say is inspired by "home feeling". The car shows off Lancia's new family face, and has rear lights evoking the brand's famous Stratos models.

JuneYao Air EV Planned for '25

GENERAL NEWS

China's JuneYao Auto have revealed official images of their first car, the Air. It is expected to be unveiled in the second quarter of 2024, priced below C¥200,000 (28,000 USD), and to go on sale in 2025.

The Air is designed with what the company are calling 'minimalistic aviation aesthetics' and 'ultimate one-box', and is based on a self-developed pure electric platform.

The front is decorated with irregular sharp LED headlights and a closed face, coupled with a trapezoidal subgrille at the bottom.

All-electric Jeep® Wagoneer S

GENERAL NEWS

The Jeep® brand is celebrating another year of firsts in 2024, preparing to launch its first global battery-electric vehicle (BEV) and expanding its lineup of legendary SUVs. Meet the all-new, all-electric premium Jeep Wagoneer S.

Built on the all-new, highly flexible, BEV-native STLA-Large platform, the all-electric Jeep® Wagoneer S offers standard 4xe capability with all-terrain management, advanced Jeep brand-focused technology and impressive performance credentials, including 600 horsepower and a lightning fast 0-60 mph time of around 3.5 seconds. Driven by aerodynamic efficiency, its sleek exterior design is uniquely marked by a reimagined LED-lit class-exclusive seven-slot Jeep brand grille.